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[continued on back cover

THE ULSTER MEDICAL JOURNAL

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Contents continued from front cover

The Ulster Medical Journal, Volume 60, No. 1, p. 129, April 1991.

Book review

Difficult medical management. By R B Taylor. (pp 729. £47.00). Philadelphia: W B Saunders Company, 1991.

This book considers a series of acute and chronic medical management problems. Separate chapters on each topic give some essential background information before concentrating on therapeutic options. Some are dealt with in quite a didactic fashion, others enter into broader discussion. The chapters I read were clear and informative. Some bits of pharmacology were difficult to translate from US to UK practice. On a few occasions treatments suggested are a little surprising reflecting also different practice across the Atlantic. The difficulty with this book, however, is in deciding who in the British Isles will wish to buy and read it. For hospital physicians, who have chosen the difficult and often ill understood role of maintaining a general interest in internal medicine, there is much that is useful and interesting. But even the most broadly based hospital physician will find this book rather too wide ranging with its coverage of some paediatric and psychiatric issues. On the other hand most family practitioners in this country (and it is their counterparts in the USA for whom this book is mostly intended) will find the orientation too much towards hospital practice.

P M BELL

CORRECTION : Behçet's disease presenting with mononeuritis multiplex. Linda J E Walker, M W Swallow, M Mirakhur.

The correct spelling of Dr Behçet's name is as given: the spelling Beçhet as printed in the Ulster Medical Journal 59, October 1990 was an editorial error.

DRH.

The Ulster Medical Journal

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The Ulster Medical Journal, Volume 60, No. 1, April 1991.

THE ULSTER MEDICAL SOCIETY

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. . . . . 19 . . . .

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The Ulster Medical Journal, Volume 60, No. 1, pp. 1 – 9, April 1991.

Emergency care in a country practice

H Baird

Presidential Address to the Ulster Medical Society, 11 October 1990.

The history of general practice is largely the history of medicine. Politicians have commented that there are as many different concepts of general practice as there are general practitioners; on the other hand as many types of general practice are demanded by patients as there are types of patients. Yet a common thread runs through the whole of general practice — the supply of the skilled medical service to all those who need it at all times.

General practice is about people, the doctors, the nurses, the paramedical staff on one hand, the patients and their relatives on the other. In Britain personal medical care can be traced to pre-Roman times. Medical care began with the family — women looking after their children, and their men learned, for example, that bleeding could be staunched by pressure from the hand, and that thorns and parasites could be extracted with the fingers. They treated minor ailments with simple domestic remedies and those who became particularly skilful at it were increasingly in demand as the communities grew: the origins of general practice. Serious disease which prevented the sufferer from taking his share of the tasks that were required of him differentiated him from the rest of the tribe. His fate then depended on the basic nature of the economy. It may have been economically necessary to kill members of the nomadic hunting and fruit gathering groups once they were incapable of carrying out their duties. The economy of later static agricultural societies would have allowed them to take a more liberal attitude towards those who were ill, and to attempt to provide them with medical care. General practice evolved through the ages and indeed continues to evolve with the new contract introduced last April.

Many of today's problems are not really new; satisfactory medical care still requires more than technical knowledge. To see the patient as a whole human being requires a compassionate doctor who has the knowledge, skill and resources to provide relief of symptoms, comfort of body and, if possible, cure of the condition. The general practitioner has been defined by the Royal College of General Practitioners as a doctor in direct touch with patients who accepts continuing responsibility for providing or arranging their medical care which includes prevention and treatment of any illness or injury affecting the mind or any part of the body.

My practice is in Ballyclare, a small market town in Co Antrim, the valley of the Six Mile Water. The name originated not from the length of the river but from the distance from Carrickfergus, being the first watering place on the journey north

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Herbert Baird, MB, BCh, FRCGP, The Health Centre, George Avenue, Ballyclare. Associate Adviser in General Practice, Northern Ireland Council for Postgraduate Medical Education.

for troops. The practice is mainly rural with farming being the principal industry: the lowlands cultivated for crops and the hills grazed by sheep. Many small villages lie scattered through the countryside linked by country roads, but the area is also traversed by main trunk roads and motorways running from the province to Belfast and the port of Larne. The practice is based at Ballyclare Health Centre with a patient population of 13,854 who are looked after by six doctors and a practice team of 31. In 1989, 34,108 consultations took place at the health centre and 6,827 home visits were made. This is a patient/doctor contact of 3·0 per annum.

Tonight, I want to concentrate on one aspect of general practice care which is often overlooked but is nonetheless important, an aspect in which we in Ballyclare have had a special interest and have therefore developed it to a greater degree than many other practices. Emergency care, or to give it its modern name immediate care, I define as the provision of early comprehensive medical care by a skilled practitioner with the appropriate equipment. In the nine months from 1 June 1989 — 31 March 1990 we received 147 calls requesting urgent medical assistance. Twenty-eight (19·1%) of the call-outs were for trauma and 129 (80·9%) were for serious illness. Eighty-one (55·1%) of the patients attended were male, 66 (44·9%) were female and the ages ranged from birth to 96 years. The timing of the call-outs showed that the greatest frequency was in the early morning for illness, and in the late afternoon for accidents. The quietest period was from 10.00 am to 4.00 pm. Cardiac conditions were the commonest reason for requesting an urgent call-out, with 43 (29·3%) recorded. Trauma 28 (19·1%) was the second commonest; and conditions affecting the central nervous system, 20 (13·6%) third commonest. (Table I). Maternity care was provided for 140 women in the nine months and intrapartum care provided for 48 in the GP Maternity Unit at the Moyle Hospital but these figures were not defined as emergency call-outs. Respiratory conditions, abdominal conditions, metabolic and diverse group of conditions were all recorded and analysed.

I would like to discuss the management of some of these groups of conditions and the preparations made by the team for dealing with them. Each doctor is responsible for his personal medical bag and his personal emergency kit. The medical bag contains his normal everyday equipment plus some basic common medication and the methods for giving them. The personal emergency bag will

TABLE I

Major systems affected in 147 calls for urgent medical assistance during a nine month period (including one bogus call)

	No.	*%*
Cardiac	43	29·3
Trauma	28	19·1
Cerebral	20	13·6
Respiratory	18	12·3
Abdominal	13	8·8
Others	24	16·3

contain basic dressings and instruments, airways, giving set and IV fluids, which could be required any time in his day to day work. An additional supplementary emergency kit is kept at the health centre during the day and is carried by the doctor on call at night and weekends. A communication system which gives rapid access to the doctor on call either at home, in his car, or in a patient's house is essential. We have an emergency telephone line, the number of which is known to patients, ambulance control, fire service and police. The car of the doctor on call is fitted with a portable telephone and he carries a bleeper in his pocket. This ensures that at all times he is in rapid communication with his home or health centre. A green "medi-flash" beacon is carried in the car for use on the way to urgent cases or accidents.

ANALYSIS OF EMERGENCIES

This survey of emergency call-outs commenced 1 June 1989 and finished 31 March 1990 with each doctor completing a proforma following the call-out. After discussion the definition of what constituted an emergency call-out was agreed and defined as one that "necessitated an early response". To deal first with the less common conditions, (Table II), it was surprising that there were only five emergency call-outs for diabetic patients. Four of these were for insulin coma — patients were treated with 50% dextrose in two cases, and decadron was required in addition in one of these. Oral administration of sugar was sufficient in two to abort the attack. The remaining case, a male aged 20, was found to be dead in bed: he was recognised as someone who took minimum care of himself and of his diabetes, and on quite a number of occasions had had hypoglycaemic attacks in the past. Only one patient in this group required hospital admission.

Also included in this group are peripheral vascular conditions, three suicides, a cot death and a delivery of a baby in an ambulance. The experience of dealing with a cot death is always traumatic for the doctor as well as for the parents. To understand the parents' sorrow, feeling of guilt and often aggression towards the doctor who may have seen the baby in the previous day or two with a minor upper

TABLE II

Conditions less commonly resulting in an emergency call-out during a nine month period

Other conditions — 24 (16·3%)	
Vascular	6
Hypoglycaemia	5
Infections	3
Suicide	3
Miscarriage	2
Cot death	1
Alcohol intoxication	1
Musculo-skeletal	1
Acute vertigo	1
Delivery in ambulance	1

respiratory tract infection which may or may not have required therapy, requires all the general practitioner's skill and empathy, particularly as the involvement of the police has to be explained to the parents and also the requirement for a post mortem examination.

The delivery of a baby in the ambulance took place at 5.00 am. I received a call from the ambulance control asking me to attend an ambulance at the roadside where a patient was being delivered by ambulance personnel. On arrival I found two ambulancemen, a mother with a newly delivered baby, third stage incomplete, and her husband in the ambulance. On examination, the placenta had separated and I delivered it and was about to give syntometrine when I noticed the ambulanceman who had performed the delivery on his knees at the front of the ambulance. He was complaining of severe chest pain radiating into his shoulders, and as I looked at him he collapsed, losing consciousness. We lifted him on to the stretcher, applied the monitor leads to his chest and discovered a heart rate of 30 per minute. This responded rapidly to atropine intravenously, increasing to 80 per minute. He regained consciousness, still complaining of his pain. The electrocardiograph showed no evidence of infarction. The pain was relieved by diamorphine and his condition stabilised. I then returned to the baby, clamped the cord, separated the placenta but unfortunately my only ampoule of syntometrine had dropped to the floor and smashed. Despite this being her fifth child she did not bleed, and both mother and baby are well. Unfortunately, the ambulanceman died the following day and a post mortem revealed he had a dissecting aneurysm. The mother was naturally upset at his death.

Respiratory conditions accounted for 12% of the call-outs (Table III). The commonest condition encountered was asthma (61·1%), as might be expected. The management of the acute asthmatic attack has changed in the past few years from intravenous therapy to the administration of nebulised drugs. Eleven patients, eight female (72·8%) and three male (27·2%) were treated, nine by portable nebuliser with good effect and one with intravenous aminophyllin (she had previously used her own nebuliser without effect). In one patient the condition had settled prior to the doctor arriving, 14 (77·8%) were treated at home, and only four (22·2%) required hospital admission. There were no deaths from respiratory conditions.

TABLE III

Respiratory conditions requiring emergency call-out

Respiratory conditions — 18 (12·3%)		
Asthma	11	61·1%
Infections	3	16·7%
Choking	2	11·1%
Pneumothorax	1	5·6%
Bronchitis and emphysema	1	5·6%

Abdominal conditions necessitated 13 emergency call-outs (Table IV) and included five various abdominal colics, two cases of acute retention of urine and only one with a perforated duodenal ulcer (a condition which now is encountered less frequently). Six patients (46·2%) required hospital admission and seven (52·8%) were looked after at home.

TABLE IV

Abdominal conditions requiring emergency call-out

Abdominal conditions — 13 (8·8%)		
Bowel colic/obstruction	3	23·1%
Renal colic	2	15·4%
Urine retention	2	15·4%
Perforation	1	7·7%
Torsion of testes	1	7·7%
Cholecystitis	1	7·7%
Pelvic inflammatory disease	1	7·7%
Others	2	15·4%

Cerebral events necessitated 20 call-outs (Table V) — 12 (60%) female, 8 (40%) male. This was a surprising finding and constituted over 13% of the work. Febrile convulsions accounted for four, and three of these required treatment with rectal diazepam prior to admission to hospital. Epileptic attacks were diagnosed in eight patients and in three of these patients it was the first attack. Two patients, a man of 83 and a girl of 16 required hospital admission, both with first attacks. Nine patients (45%) in the group were admitted to hospital, and 11 managed at home. Two deaths occurred: a male with a cerebrovascular accident, and a girl of 22, known to be epileptic, was found dead in bed the cause of her death being aspiration of stomach contents.

TABLE V

Cerebral events requiring emergency call-out

Cerebral events — 20 (13·6%)		
Febrile convulsion	4	(20%)
Epileptic fit	9	(45%)
Cerebrovascular accident	3	(15%)
Faint	2	(10%)
Others	2	(10%)

The commonest symptom necessitating an emergency call-out was chest pain (Table VI). Much is written of the hospital cardiac team — in general practice it is usually a team of one. It requires preparation and practice to optimise medical care. We have found it advantageous to assemble a cardiac kit, composed of an electrocardiograph, monitor and defibrillator, with a cardiac case containing syringes and needles, venous access cannulas, drugs, airways, ambu-bag, and dressings. This ensures that all is to hand when required. Twenty-four (55·8%) of these patients were diagnosed as having suffered a myocardial infarction; 13 (30·2%) were suffering from angina; and three (6·9%) were acutely short of breath caused by left ventricular failure. Nine men and four women were diagnosed as having acute angina. They were treated with either nitrolingual

spray, glyceryltrinitrate tablet or nifedipine capsules to relieve the anginal pain. If this failed diamorphine was given intravenously in sufficient quantity to relieve the pain. All had an electrocardiograph performed to rule out infarction, and blood samples for cardiac enzymes were taken from the five patients managed at home. Eight patients with angina were admitted to a coronary care unit, all of whom had required diamorphine to relieve the pain prior to admission. None of the patients in this group were subsequently shown to have suffered a myocardial infarction.

TABLE VI

Cardiac conditions requiring emergency call-out

Cardiac conditions — 43 (29·3%)		
Myocardial infarction	24	55·8%
Acute angina	13	30·2%
Left ventricular failure	3	6·9%
Others	3	6·9%

Myocardial infarction is the most frequent emergency with which a general practitioner has to deal. Mortality rates from heart disease are quoted as 80% for men and 58% for women in Northern Ireland. It is accepted that mortality rates are the highest in the first few hours following a myocardial infarction and that many of these deaths are preventable if medical care is available to prevent or to treat cardiac arrythmias. The principles of coronary care as first set down in the early days of mobile coronary care are largely unchanged: 1. Relieve the pain. 2. Stabilise the rhythm. 3. Treat the cardiac failure. A fourth principle has been added in the past few years and that is, when possible, to dissolve the thrombus by use of thrombolytic agents.

Twenty-four patients — 18 males and six females — were diagnosed as having suffered a myocardial infarction. Eight were dead on the arrival of the doctor. Ages ranged from 34 to 82 years, mean 70 years; all except the 34-year-old had previous heart disease. Death was confirmed by the use of the cardiac monitor. Three patients died when the general practitioner was attending them (early deaths). This is an area where it is theoretically possible to improve mortality rates. They were aged 70 — 84 years. Two presented with severe cardiogenic shock which did not respond to resuscitative measures. One female of 84 years with a long history of heart disease, who suffered a myocardial infarction confirmed by electrocardiograph, developed ventricular fibrillation during diamorphine administration, and terminal asystole following DC shock.

Two patients, a male of 54 and a female of 74, presented with upper chest pain referred to the shoulders and back. Both had normal electrocardiographs, but both died. The diagnosis of dissecting aneurysm was made and confirmed in one by post mortem examination. Two patients died in the hospital coronary care unit and 11 survived more than four weeks. This produces a gross mortality rate of all patients presenting with presumed myocardial infarction of 54%. This is a depressing figure, but if only those patients who were proved to have suffered a myocardial infarction and who were alive when the doctor attended them are included the mortality rate drops to 33%.

Thrombolytic agents have been used increasingly in the past few years in hospitals. Information is required as to the optimum time to give the drug. We now carry anistreplase (Eminase) but because the majority of our patients are admitted to the Waveney Hospital coronary care unit where the consultant cardiologist (Dr Wilson) is involved in the APSAC European Study, we have been requested not to use a thrombolytic agent prior to the arrival of the cardiac team so that these patients can be included in this study. However, patients who are admitted to other hospitals are considered for the administration of anistreplase and the first such patient — a man of 65 with no previous cardiac symptoms — was given it just following the end of this survey. He is alive and well with no post infarction angina — he did, however, have an episode of ventricular fibrillation when the drug was being given but this responded immediately to a DC shock. The use of the defibrillator can be life-saving. In this short study it was used on three occasions on seriously ill patients but a normal rhythm was not re-established. In a previous much larger survey of our patients, a rhythm was re-established in 39% and long term survival was 22%. We have found it necessary to practise resuscitation on a regular basis. The giving of a DC shock is easy as long as you remember the right buttons to press on the machine!

Immediate care for accident victims I have kept to the end. It has been a feature of this practice for some 25 years since we first developed an accident unit which enabled a doctor carrying the appropriate equipment to be alerted early by ambulance control, police or public when an accident with injury occurred. The accident equipment includes a resuscitation box, splints, stretcher and blankets and 50% nitrous oxide and oxygen (Entonox). A yellow jacket with "doctor" on it is used at the scene. This enables the fire, ambulance and police personnel to identify the doctor and very much aids communication and rescue.

The principles of immediate care for accident victims are 1, Do not increase the injuries by unnecessary movement; 2, Stabilise the patient's condition — maintaining airway, arresting bleeding, maintaining circulatory volume, splinting major fractures; 3, Treat and prevent shock; and 4, Plan movement. The prevention of shock is important. Once it has become established it is hard to reverse. So think in terms of 1, Relieving the pain; 2, Maintaining the body heat; 3, Maintaining circulation volume; and 4, Reassurance.

The commonest causes of death caused by trauma are obstruction to the airway, haemorrhage (often internal) and cervical spine injury. The object of immediate medical care is to prevent early deaths, one third of which occur before the injured reach hospital and a further third occur in the first 24 hours. Poor care at the scene of the accident is sometimes a contributory factor. Twenty-eight call-outs for trauma were recorded (19%). (Table VII). The majority, 16 (57%) were for road traffic accidents, seven for home accidents, three for sports injuries and two for gunshot wounds. The commonest type of injury was to the head, in 14 patients, five of whom were unconscious. Major fractures were recorded in eight. Three victims were confirmed dead on the doctor's arrival. Twenty patients (71%) were taken by ambulance to hospital accident and emergency departments. Three of these required intravenous fluids prior to moving. Five (18%) were cared for at home and three bodies were removed to the mortuary after death was confirmed. As far as I can ascertain there was only one late death in this group, an overall mortality rate of 14%.

TABLE VII

Causes of trauma, and types of injury in 28 patients

Trauma — 28 (19·1%)					
Cause			*Injury*		
Road traffic accident	16	57·1%	Head injury	14	50·0%
Home	7	25·0%	Fracture/dislocation	8	28·6%
Sport	3	10·7%	Minor injury	3	10·7%
Gunshot	2	7·1%	Dead on arrival	3	10·7%

The last accident I attended a few weeks ago occurred at 11.20 pm when I received a call from ambulance control asking a doctor to attend a serious accident where a car had gone under a lorry. I arrived to find an articulated lorry on fire and half a car: the front half was missing. I later discovered it under the lorry, and the body of the driver in the ditch. Death was confirmed using a cardiac monitor. A second accident occurred in the main street of Ballyclare at 3.00 am when a car wrapped itself around an electricity pole trapping the driver's legs, both fractured and lacerated, under the passenger seat and the dashboard. You will appreciate the difficulty in caring for a trapped victim for 40 minutes until the fire service could cut his fractured legs free. Pain relief was obtained by using 50% nitrous oxide and oxygen (Entonox) and his circulatory state was monitored by pulse rate and volume.

AUDIT

The emergency call-out is a small proportion of the total requests for home visits, only 6·9%, but nevertheless it is an important part where the doctor can influence not only morbidity but mortality. In this series 78 (54%) patients were admitted to hospital, 48 (33%) were managed at home and 19 (13%) were found to be dead. In an attempt to audit this work the doctor attending each call-out was asked to assess the significance of the medical input. In 44 (32%) of the cases, this input was thought to be "very significant", in 61 (45%) "significant" and in 31 (23%) "of little significance". The last figure included the call-outs when the patient was dead on arrival.

The estimated time taken from receiving the request for help and arriving with the patient ranged from three to 25 minutes, average 11 minutes. The time involved with medical treatment at the scene ranged from three to 90 minutes, mean 34 minutes. General practitioners will understand that 34 minutes in the middle of a day is a significant period to be away from the consulting room or from home visits. The busy practice has to make the necessary alteration to the day's routine work to cope when required, and this usually necessitates the other partners seeing extra patients.

The quality of care provided by doctors has been debated at great length in recent months. It has been stated that there is no incentive for doctors to maintain high standards, and that as there is no external method of auditing competence it is astonishing how much good medical practice there is around. Perhaps it is the doctors' "self image" that maintains it.

What do our patients think of our immediate care? I don't really know. It is perhaps an oversight on my part for I have not asked them, but what I can tell you is that our emergency equipment fund is usually healthy and kept so by individuals and community groups.

Over 100 years ago Sir Luke Fildes painted a famous picture entitled "The Doctor". It was hailed as a noble tribute to a noble profession, and was based on a Dr Murray who treated his son who was fatally ill and died on Christmas Day 1877. Let us, who are members of that noble profession, continue to provide a high quality of care; to listen to what patients are saying about better communication (listening and explaining), and about better quality and availability of care; and go forward in partnership and harmony with our patients towards and into the twenty-first century.

The Ulster Medical Journal, Volume 60, No. 1, pp. 10–20, April 1991.

Enjoyment of life depends on the liver

G W Johnston

Annual Oration, Royal Victoria Hospital, 4 October 1990.

The first formal opening address was delivered on 3 June 1826 by Dr James McDonnell, the then senior physician at the Belfast General Hospital in Frederick Street, the forerunner of the Royal Victoria Hospital. His subject on that occasion was "Systematic Medicine". The opening oration is now an annual event and I am honoured in being asked to give it this year though I realise that its an honour which comes with age rather than ability. Traditionally at this opening address the new clinical medical students were first welcomed to the hospital, having just completed their pre-clinical studies. Changes in the undergraduate curriculum, examination dates and student habits make this aspect of the lecture less appropriate than in decades past. However I hope that some of what I want to say is applicable to the students present as well as nursing colleagues, members of the various paramedical specialities, doctors in training and even established clinicians. To quote Montaigne, what I have done is to "gather a posy of other men's flowers and only the thread that binds them is my own".

When Paul the Apostle warned his friends in the city of Corinth to "have nothing to do with loose livers", he was not of course referring to some form of hepatic visceroptosis but rather to a particular lifestyle which he considered undesirable. Today I want to look at both meanings of the word "liver". As defined in the Oxford English Dictionary, firstly, a liver is one who lives in a specific way, and secondly, the liver is the large glandular organ in vertebrates secreting bile and purifying venous blood.

A career in medicine is demanding and in order to obtain fulfilment and satisfaction I suggest that two ingredients are essential. The first is *commitment* and the second, *contentment.* The commitment should be without contention and the contentment without complacency. Hippocrates said, "life is short, the craft so long to learn". Pavlov put it this way, "science requires your whole life, even if you had two lives to give it would still not be enough; science demands of man effort and supreme passion". In the clinical room of Wards 15/16 there hangs the motto *carpe diem.* Mr Terence Kennedy, whom we are delighted to see with us today, my senior colleague for nineteen years, asked one of his friends with a classical education to give him the Latin equivalent of "don't let the grass grow under your feet". He came up with the Latin motto beloved by clock makers, literally "catch the time" or "make use of every moment". Enjoyment of life demands commitment and nowhere more so than in the field of medicine. It requires rolling up the sleeves and getting the hands dirtied; there is no substitute for hands-on experience. But it is not a chore — its fun. Dr Schuster, Professor of

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G W Johnston, MCh, FRCS, Consultant Surgeon, Royal Victoria Hospital, Belfast BT12 6BA.

Dermatology, at the Royal Victoria Infirmary, Newcastle upon Tyne remarked, "medicine is wildly exciting and learning about it should bubble with excitement". Recently the Ulster Surgical Club visited Leicester for a clinical meeting at the Leicester Royal Infirmary, At the entrance to that hospital there is a clock bearing the motto — *In duty lieth happiness.* However, it is not as simple as that. Commitment alone does not guarantee happiness, as Solomon of old found out. The lifetime achievements of Solomon are staggering. His acquirement of wisdom, his irrigation schemes, his agricultural and horticultural programmes, his social welfare organisation, his accumulation of wealth, his involvement with the cultural arts and his constructional accomplishments culminating in the magnificent temple at Jerusalem are all well documented. Yet towards the end of his life he said, "when I surveyed all that my hands had done and all that I had toiled to achieve, everything was meaningless, a chasing after the wind, nothing was gained under the sun". Solomon did not experience the Leicester Royal Infirmary motto, and it wasn't a case of all work and no play for Solomon. He states "I denied myself nothing my eyes desired. I refused my heart no pleasure". He indulged in wine, women and song. We are told that he looked after, if that is the right term, a thousand wives and concubines whom he describes as "the delight of the heart of man". There was no doubt about his *commitment* both in work and in play, and yet he failed to achieve the second ingredient for a happy life, namely, *contentment.*

Last year three of our distinguished, retired consultants published their memoirs and I want to refer to them. Professor Frank Pantridge made an outstanding contribution to cardiology in general, and coronary care in particular, in this hospital, in this province and indeed world-wide. His commitment to cardiology was total and his achievements were enormous. Yet in his memoirs, significantly entitled "An Unquiet Life", like Solomon he admits to a lack of contentment. He joined the Royal Army Medical Corps the day after the Second World War broke out. The following year, 1940, he found himself stationed in Singapore with the Second Battalion of the Gordon Highlanders. In that officers' mess in the Far East he claims that he found "a remarkable *esprit de corps".* Sadly he goes on to say "I had never seen it before and I have never come across it since. It did not exist in any RAMC fraternity or Army Hospital, and certainly not among the staff of any National Health Service Hospital that I was to encounter later".

Commitment should be without contention. However, medicine is not a spectator sport; it requires not only involvement but also an element of competition. Thus, in order to ascend the promotion ladder one has to outpace the opposition. This does not mean that others should be trampled over on the way to the top, as occurs all too often in the business world. On your way through medical school and subsequent post-graduate training, you will make many great friends. Respect them, cherish them and keep them. A good doctor is not a soloist. He is a member of a very large choir and real success comes only when individuals blend together in harmony. It is possible to have commitment without contention and we must strive to achieve that balance.

The motto of the Royal College of Physicians and Surgeons of Glasgow is *Non vivere sed vacere vita* which roughly translated means "not to live but to enjoy life". That brings me to my next point. Enjoyment of life depends on the contentment of the liver. Paul, writing from the Christian standpoint to his friends at

Colossi said, "I have learned the secret of being content in any and every situation". Paul's words are all the more surprising when we realise that he wrote them while languishing in a Roman prison. The Trappist monks take vows not only of poverty, chastity and obedience but also a vow of silence. They are not permitted to talk to each other. In one Trappist monastery the Abbot interviewed the monks on admission and yearly thereafter when they were allowed to make only one statement. At the end of the first year one monk told the Abbot at interview that he found the monastery intensely cold in winter. A year later the same monk complained that the monastery was still cold and the food was intolerable. At the end of the third year he said "The place is still cold, the food intolerable and the silence unbearable and I've decided to go back home". The Abbot replied "I think that is probably the best thing in your case. You've done nothing but complain since the day you arrived". In Sir Ian Fraser's memoirs which he published last year under the title "Blood, sweat and cheers" he points out that what people write in their memoirs often reveals as much about themelves as about the people and events they describe. His book vibrates with fulfilment and contentment and he ends by saying, "I have had one of the happiest lives that a man could wish for". Sir Ian, now in his ninetieth year, apologises that he cannot be with us this morning. We all wish him many more happy and contented years with Lady Eleanor.

The third retired consultant to publish his memoirs last year was Dr Maurice Brown. In his book, "Where There's Life", he tells of the horrendous wartime injuries, the fight to cling to life and "the laborious struggle back to normality after the war". The trauma of this period of his life dominates the book and little more than ten per cent of the volume relates to his pioneering work in cardiothoracic anaesthesia. His experiences might cause him to paraphrase the title of today's lecture to "Enjoyment of life depends first and foremost on being alive". Since retirement he has enjoyed world travel, but most of all, contentment as he relaxes by the shores of Strangford Lough.

The contentment that I advocate should not be interpreted as complacency. For example, there is a feeling of arrival when one gets a consultant job and a distinct temptation to put the feet up. Medicine is a rapidly changing profession and it is the duty of each of us to keep abreast of advances in our own fields. It is estimated that ten per cent of the week's work needs to be devoted to continuing education: managers please take note! A good doctor never graduates; he is a perpetual undergraduate in the school of experience and learning.

As I approach closer to retirement (and the senior registrars in surgery here today should not read too much into those words), I hope that I can continue to find contentment when the scalpel has been laid to rest. It will mean a change of gear and it may mean a change of direction as well. I have been impressed by the diversity of activities enjoyed by my retired consultant colleagues. Some take up painting or become post-graduate advisers. For some it is theology or travelling. Others devote their energies to music or become Ministry men. Some turn to antiques or anthropology. Woodwork and writing are also popular, but perhaps gardening and golf have the biggest following. It was George Bernard Shaw who said "old age brings golf rather than wisdom" but I have to say that if there is no golf now, there will be no golf in old age. If there is no contentment now, there will be no contentment in retirement. At a press conference just prior to retirement,

a famous American general was asked what he hoped to do when he retired. He thought for a moment and then he said, "I have got a house in Virginia with a veranda which looks down over the valley. I think I will spend my first six months just sitting there in a rocking chair enjoying the view". The press wanted to hear more and asked him, "What will you do in the second six months?" The general said, "Perhaps I might just rock a little". Ideally we should find contentment in our life's work and then be able to carry that contentment through into retirement. Enjoyment of life depends on the liver.

Now I want to move on from the philosophical to the physical, from the organism to the organ, from the liver who lives to the liver which maintains life. Throughout history we shall see that one's enjoyment of life could well depend not only on the health of one's own liver but also on the health of the liver of some poor unfortunate animal or even on the viability of another human liver in these days of transplant surgery.

The Garden of Eden is usually considered to have been sited in the region of South West Asia known as Mesopotamia, which literally means "between the rivers". This cradle of civilisation lay in the area between the Tigris and Euphrates rivers. The most prominent region of Mesopotamia was Sumer and 5000 years ago these Sumerian people had a written language known as cuneiform. Of the 30,000 cuneiform tablets discovered, no less than 800 deal with medical subjects. The people in the land of the two rivers considered that illness was a curse, a punishment from one of their numerous deities. The divine punishment was carried out by demons and their catalogue of diseases listed some 6,000 responsible evil spirits. The doctor's job was to find out which type of demon was inflicting the illness and then learn the expiation demanded by the gods. The chief diagnostic aid was divination and one of the most important forms was *hepatoscopy,* that is, a detailed examination of the liver of a sacrificed animal. Clay models of the liver were kept in the temple and markings found on some of them suggest that they were used to instruct the young priests in the art of divination. Since it was believed that the liver was the seat of the soul, to inspect the liver of a sacrificed animal was to see into the soul of the animal and therefore know the mind of the gods. When the diagnosis was made, ceremonies, prayers and sacrifices were the common means of beseeching the gods for a cure. Fortunately not all patients were left to the fate of the hepatoscopists, who might be considered the physicians of the day. There were also a few surgeons around. In ancient Nineveh well-constructed surgical instruments have been unearthed from under eleven feet of silt. Instruments found include bronze lancets, well-constructed saws and even a skull trephine. Mesopotamian surgeons were capable of draining abscesses, dealing with superficial wounds, and setting broken bones.

More than 17 centuries before Christ, the Babylonian civilisation had a famous king named Hammurabi (1792–1750 BC). He was a great writer and inscribed his laws on black diorite stone. One such stone, about 2 metres in height, was discovered in what is now modern Iraq. It deals with medical topics and is currently housed in the Louvre museum in Paris. One of its laws states that "if a doctor has treated a man for a severe wound and causes him to die, or has opened a man's tumour with a metal knife and destroyed the man's eye, his hands shall be cut off". Such rules gave internal medicine a particular attraction and most would-be medical advisers stuck with hepatoscopy rather than risk a career in surgery

which could end rather abruptly. After all, in the field of hepatoscopy only the animal and not the clinician was sacrificed.

In ancient Babylon there was another way in which one's enjoyment of life could depend on the liver and the practice of hepatoscopy. We are given an account of this in the books of Ezekiel (chapter 21) and II Kings (chapter 25). Nebuchadnezzar, King of Babylon from 605–562 BC, was on the warpath marching westward and conquering all before him. At a fork in the highway he had to decide whether to march against the Ammonite city of Rabbah or take a more southerly route against Judah and the fortified city of Jerusalem. We are told that one of the methods he used to make the decision was hepatoscopy. He consulted the liver of a sacrificed animal and as a result he decided to march against Jerusalem and soon laid seige against the city, a seige which was to last for a year and a half. On 16 March 597 BC the city fell to his army. The walls were torn down, the city sacked, the temple and palace burned and the temple treasures looted. Most of the inhabitants who were not killed were taken off to slavery in Babylon. Hepatoscopy in the hands of Nebuchadnezzar's priests had proved more kind to the citizens of Rabbah than those of Jerusalem.

Hippocrates, often honoured as the "Father of Medicine", was born on the Greek island of Cos in 460 BC. He was introduced to medicine by his father and travelled widely before settling at Laissa in central Greece. To him medicine was the art of clinical inspection and observation and he established what we now call "bedside medicine". In reaching a diagnosis, examination of an animal's liver was replaced by examination of the patient himself and also of his urine. Now *uroscopy* was to replace hepatoscopy. The quantity of urine, its concentration, colour, smell, transparency, the nature of the sediment and the presence of blood or mucus were all noted and used in establishing a diagnosis. Hippocrates, like Galen, who lived five centuries later, believed that the liver was the seat of the soul. This is a view that is not entirely extinct in Northern Ireland today. A few months ago I prepared a questionnaire on four body organs, namely, the heart, liver, kidneys and brain. A consecutive series of 100 patients attending surgical outpatients were asked to fill in the questionnaire. Of the four organs listed, we found that least was known about the liver, 35 per cent of the patients getting the answer wrong, compared to only eight per cent who obtained wrong answers for the heart, kidneys and brain respectively. Eight of the hundred patients considered that the liver was the seat of the soul; perhaps hepatoscopy is not entirely dead!

Ralph Waldo Emerson, the American essayist, poet and philosopher of last century once wrote, "I know a witty physician who found his creed in the biliary duct and used to affirm that if there was disease in the liver, the man was a Calvinist and if the organ was sound he became a Unitarian". While I may not have found my creed in the biliary tree as Emerson's physician friend did, I admit that the liver and its connections within the body have had a significant effect on my life and medical career. My interest in the liver was first stimulated by Professor Harold Rodgers, who was a pioneer in the field of portal hypertension. He had performed the first portal systemic shunt in the United Kingdom prior to coming to Belfast. He established the method of injection sclerotherapy as the treatment of choice for acute variceal bleeding, a technique now adopted world-wide. He was primarily an astute clinician, an excellent technician and a didactic teacher. He may not have been a laboratory researcher, but he stimulated and

encouraged others in this direction. By the time I came to work with Professor Rodgers, portacaval shunt was established as the standard treatment for bleeding oesophageal varices.

The technical feasibility of portacaval shunt was first demonstrated in the dog by Eck in St Petersburg in 1877. He anastomosed the portal vein to the vena cava in eight dogs. One dog died within 24 hours and a further six died within one week. The final dog survived for two and a half months before running away and was therefore lost to follow up. On the basis of these results he said, "It was established that the blood of the portal vein, without any danger to the body, could be diverted directly into the general circulation and this by means of a perfectly safe operation". He suggested that this operation might have a therapeutic role in patients with ascites, a somewhat premature observation considering his disastrous results. Subsequently Eck was called for active duty with the Russian army and when he returned his interests turned to other fields; indeed he became a mining engineer where I trust for the sake of the miners he became more conservative in interpretation of results. Some sixteen years later, a fellow Russian, Pavlov, returned to the study of the Eck fistula and described for the first time the drowsiness and ataxia seen in dogs following ingestion of a protein meal after a portacaval shunt operation. He and his colleagues coined the term "meat intoxication" and correlated the symptoms with an increase in blood ammonia. In 1903, Vidal, a French surgeon performed the first successful end-to-side portacaval shunt on a 34-year-old alcoholic, cirrhotic woman with life-threatening haemorrhage. The patient survived the operation but developed encephalopathy two weeks later and died after several weeks from sepsis. Unsatisfactory results by other continental workers led to the virtual abandonment of shunt surgery for about 40 years. In the mid–40's Whipple, Blakemore and others in the States established the role of portal systemic shunting operations for bleeding varices and in the next twenty years around 100,000 shunts were performed worldwide. Although an excellent procedure for the prevention of bleeding, many patients developed episodic stupor similar to the meat intoxication that Pavlov and his colleagues had described in dogs. In fact the association between hepatic disease and severe mental changes had been described in the second century by Galen who observed *"bilius ad caput recurrens delirii causa"*. However, it was not until 1954 that the term portal systemic encephalopathy was first coined by Professor Sheila Sherlock.

Seeing the severe incapacity of a few drowsy, confused, ataxic and sometimes euphoric patients following shunt surgery, I turned my mind toward possible ameliorisation of their symptoms. I started research work on dogs in the Department of Surgery. Portacaval shunt on a largish dog was not technically difficult but, like other workers in this field, I soon found that dogs tolerated shunts poorly and within a few weeks they lost weight and deteriorated. The dogs would look at me with big, pathetic eyes and give an abortive wag of the tail which made me feel like some medieval tormentor. I decided that, job or no job, thesis or no thesis, I could not do the research which had been envisaged. I went to see Professor Rodgers and told him that dogs were unsuitable animals for experimental work in portal hypertension and that I couldn't continue the work. He asked what animal would be suitable? Rather naively, I said that C.G. Child III of Ann Arbor, Michigan, had used monkeys, thinking that would be the end of the

discussion. However, Professor Rodgers lifted the 'phone and contacted Professor George Dick who was using monkeys for polio research work in the Department of Microbiology. Within four minutes I was the astonished possessor of my first four Rhesus monkeys and so the portal systemic encephalopathy research continued. Portal systemic encephalopathy is a very colourful term as are many of the names used for the description of physical findings in liver disease; for example liver palms, spider naevi, paper money forehead, foetor hepaticus and caput Medusae. This last one, caput Medusae, is interesting in its derivation. Although most medical students could identify the clinical sign of tortuous dilated periumbilical veins secondary to portal hypertension, few will ever see a caput Medusae in their clinical careers. Medusa was one of three sisters known as the Gorgons. Snakes grew out of Medusa's head and wings out of her scaly body. Anyone who dared to look into her face turned to stone. The dreaded Medusa was finally killed by the hero Perseus. The goddess Athena lent Perseus a shining shield and holding it so that he could see the monster reflected in the shield he was able to avoid looking directly at his quarry. Thus, using the shield as a mirror he crept up and cut off Medusa's head with one stroke of the sickle and carried the viprous head back to Athens. Although often attributed to Jean Cruveilhier, a French pathologist, he ascribed the recognition of this clinical sign to an Italian surgeon, Mario Severino, of a couple of centuries earlier. It is possible that Severino would have seen the unusual circular Caravaggio painting of the head of Medusa which now hangs in the Ufizzi Gallery in Florence.

Professor Rodgers, on retirement, left me a legacy of patients with liver disease and the supply has not dried up. Indeed, the reverse is true, partly due to the rise in alcoholic consumption which has doubled in the last twenty years. When I first became interested in cirrhosis, less than 30 per cent of the patients in Northern Ireland had an alcoholic aetiology. Now the current figure is greater than 60 per cent. It is sometimes difficult to define what amount of alcohol must be consumed before one can attribute an alcoholic aetiology to the cirrhosis. Someone has defined an alcoholic as one who drinks more than his doctor. I have to say that the figure of 60 per cent alcoholic aetiology at the RVH Liver Clinic was not arrived at on that basis. A weekly intake of 14 units for the female and 21 units for the male is sufficient to produce liver damage. The problem is that not all alcoholics can be trusted to give a true estimate of consumption.

One of our main efforts at the Liver Clinic is to encourage these individuals to remain off alcohol completely. If they do, some hepatic recovery can take place since the hepatocytes have remarkable powers of regeneration. The idea of liver regeneration also dates back to Greek mythology. According to classical legend, a Titian named Prometheus stole fire from the island of Lemnos and carried it in a hollow tube to mankind who had been deprived of this facility. Outraged by the theft, Zeus, as a punishment chained Prometheus to a rock on Mount Caucasus, where he was tormented by a devouring eagle which consumed part of his liver each day, only to find it restored by night. After thirty years of suffering, legend has it that he was rescued by Hercules who slew the eagle, released the prisoner's chains and set him free. The fable highlights the enormous capacity of the liver to regenerate but conveniently ignores the two major problems for the hepatic surgeon, namely, haemorrhage and sepsis. The ability of the liver to regenerate is illustrated by the following patient. In 1983 Breda was a 23-year-old with a

malignant tumour of the right lobe of her liver. The original CT scan showed a 10 cm hepatoma involving the right lobe. Although two thirds of the liver was removed, a post-operative scan demonstrated a liver almost normal in shape and size as a result of hepatic regeneration. (Fig 1). She remains well seven years after surgery without evidence of recurrence and has given birth to two children since the operation. She would have no problem identifying with the title of our talk today.

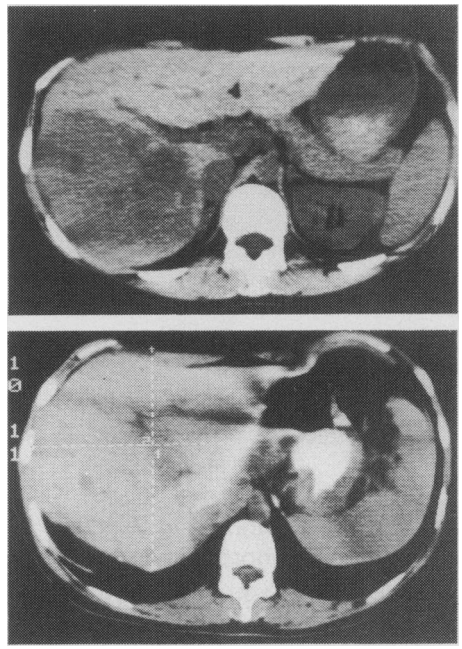

Fig 1. CT scan showing 10 cm tumour right lobe of liver (above) and regenerated liver (below).

When the liver is sick, from whatever cause, the patient feels ill and one often uses the term "liverish" to describe the condition. The "liverish" feeling is real whether it is due to sick liver cells the "morning after" or due to the protracted course of some chronic liver disease. I wonder how many wrong decisions have been made on the stage of world politics because of statesmen who felt liverish for either of the two reasons mentioned. I graduated in medicine in July 1956. On 31 October of that year, the last day of a three month spell working as house surgeon to Professor Rodgers, Britain bombed Suez. Sir Anthony Eden was Prime Minister at the time and many considered that he had made a dreadful mistake and that the Suez crisis should never have happened. Sir Anthony Eden had been in poor health for about three years prior to this event. In 1953 during a cholecystectomy operation, his common bile duct had been seriously injured. Subsequently he required two further operations at the Lahey Clinic in Boston because of iatrogenic stricture formation but he continued to be subject to bouts of ascending cholangitis with recurring fever, pain and jaundice. He frequently felt "liverish" and could well have been poorly at the time of decision-making regarding Suez. Certainly three weeks after the bombing of Suez, he went off to Jamaica on sick leave and by January the 9th the following year he had resigned as Prime Minister. A healthy liver is a good thing to take to a conference table.

The two main problems facing the patient with liver cirrhosis are liver failure and bleeding from oesophageal varices. Portacaval shunt is still a most effective way of reducing the risk of bleeding and is the gold standard so far as control of bleeding is concerned. However, the encephalopathy problem stimulated the search for other techniques to control bleeding and prevent recurrence. Injection sclerotherapy has become established as the first-choice procedure for the acute bleeding episode, and the Belfast school deserves much of the credit for this. The trouble is that rebleeding occurs unless a programme of repeated injection sclerotherapy is carried out and this demands a lot of medical time as well as patient compliance. Seven years after the start of civil disorder in Northern Ireland,

Fig 2. Russian S.P.T.U. gun (above) and Browning automatic (below).

I got involved in the gun-running business and imported my first Russian gun in 1976. Unlike the Browning automatic it was a weapon of peace to be used for the operation of oesophageal transection in the control of bleeding from oseophageal varices. (Fig 2). The original rather crude Russian gun has been superseded by a more elegant American version which is now part of the standard armamentarium in the fight against bleeding varices. Shunts, transections and injection sclerotherapy can control bleeding, but they do nothing to improve liver function or prevent progression to liver failure.

Although one of the features of liver cirrhosis is regeneration of liver cells, in end-stage disease insufficient hepatocytes remain to allow adequate regeneration, and liver failure gradually ensues. Unlike the situation with kidney failure where renal dialysis is available, we do not have at our disposal any effective hepatic dialysis. The only hope of survival depends on replacement of the sick liver with a new one and liver transplantation is now technically possible. With advances in surgical technique, improvements in organ preservation and the development of new drugs to combat rejection problems, survival in these dying patients can be greater than 80 per cent at one year. Currently in the United Kingdom about 300 liver transplants are done annually in about half a dozen centres in England. Northern Ireland, with a population of only one and a half million, is unlikely to be able to sustain a transplant programme within the next five to ten years but by the year 2000 things may be different. Of course science tells us what we can do, it does not instruct us as to what we ought to do. Liver transplantation now allows the opportunity to give life where it could not be given before and conversely to deny life where the only chance of survival, and consequently enjoyment of life, depends on the liver — of someone else. The ethical problems are many. To start with, there is a limited number of donor livers available for a disproportionately large number on the waiting list and therefore someone must decide which patients get priority. In Western society alcohol abuse is the commonest cause of liver disease. Should we exclude from the transplant programme such patients who self-inflict their liver disease and deny them the opportunity for further life? Should we with moral indignation take the view that these people do not deserve transplant? Certainly not: we don't refuse injection sclerotherapy to the alcoholic with bleeding varices, or deny resection of the lung cancer to the life-time smoker or fail to do all possible to save the attempted suicide. That being said, there is another aspect which must be considered in these patients. The post-transplant programme entails meticulous compliance to a strict medical régime of drugs for the prevention of rejection of the newly transplanted liver. The alcoholic may be unreliable in this respect and thereby destroy the hard work of the combined

medical, surgical and nursing teams. For this reason some transplant centres have been reluctant to offer the operation to alcoholics unless they have been "dry" for three to six months. Others are willing to proceed to transplant without these preconditions since the trauma of the operation can be a sobering experience.

Prior to operation the philosophy of the alcoholic is often "let my liver rather faint with wine than my heart with mortifying groans". John Bellany's self portrait soon after his own liver transplant suggests that in the agonies of the early post-operative period he may still have felt that same way. If organ availability is limited and resources are stretched, it would seem reasonable that infants, and young people in need of new livers should have priority. Here a further major problem is the availability of livers small enough for these younger recipients. Recently this has led to the use of living donors. A healthy relative, usually a parent, donates part of their liver to save the life of an offspring. This means that someone without the need for surgery is subjected to the major operation of partial hepatic resection without therapeutic benefit to the donor, although undoubtedly there is great psychological reward. Since there is a one per cent mortality risk to the donor, is it fair to put this pressure on a parent? If the parent refuses and the child dies, a guilt feeling is inevitable. In practice however, pressure usually comes from a parent who wishes to be allowed to make the sacrifice for the sake of the child.

Ethics are not intercontinental or even international and some countries and some faiths forbid the use of cadaveric transplants and thus the use of a living related donor may be the only possible option. This could open the door to commercialism as we saw recently in London in the widely publicised case of purchase of kidneys from poor living Turkish donors for transplantation into rich private patients. In the same way a rich man could afford to pay a large sum of money in return for a portion of a poor man's liver to save an ailing child. While not acceptable in Western society, it might be in some countries. After all, the father is delighted, the young patient becomes healthy and the poor man has received enough riches to feed his family for the next five years. Three happy people are not an indication of a satisfactory situation; sometimes the good of the individual must be sacrificed for the sake of society as a whole.

Professor Sir Roy Calne of Cambridge, the pioneer of liver transplantation surgery in the UK, painted the picture of a transplant operation entitled "The moment of truth". (Fig 3). Thanks to the untiring work of surgeons like Roy Calne (UK), Tom Starzl (USA) and Henri Bismuth (France) and their physician hepatologist colleagues, liver transplantation is now established and is here to stay. Indeed hepatology has progressed one stage further in that "bench surgery" of the

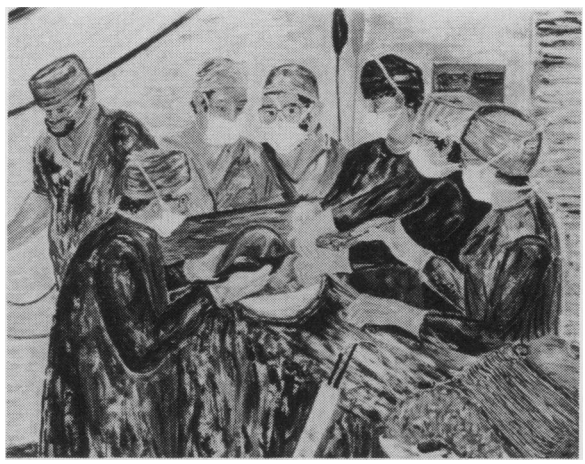

Fig 3. "The moment of truth".

liver has been performed — that is, the patient's liver is temporarily removed from the body, the required surgery carried out on the bench away from the patient and the repaired organ re-implanted in its original position — amazing indeed.

Ladies and gentlemen, there is no doubt that we have moved a long way from the era of inspection of an animal's liver as an aid to patient management to the actual replacement of the human liver. We have escaped from the superstition of hepa*toscopy* to the science of hepa*tology*. In bygone times, today and in the years to come I think you will agree that the old adage is true — "enjoyment of life depends on the liver".

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A comparison of symptoms between non-ulcer dyspepsia patients positive and negative for *Helicobacter pylori*

J S A Collins, R P Knill-Jones, J M Sloan, P W Hamilton, P C H Watt, G P Crean, A H G Love

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SUMMARY

The role of Helicobacter pylori *infection in the symptom complex associated with non-ulcer dyspepsia is uncertain, despite the presence of the organism in a high proportion of these patients. In order to exclude physician bias in history taking, 18 patients (9 female) diagnosed as non-ulcer dyspepsia, after endoscopy and gallbladder ultrasonography, underwent computer interrogation using the Glasgow Diagnostic System for Dyspepsia (GLADYS). Five antral and 3 fundal endoscopic biopsies from these patients were also histologically examined for the presence of* Helicobacter pylori *and quantitatively analysed for polymorph and chronic inflammatory cell densities per mm² of lamina propria using computer-linked image analysis. In the group of 9/18 patients who were positive for* Helicobacter pylori, *there were significantly higher antral and fundal inflammatory cell counts than in negative patients. However, analysis of the GLADYS interrogation data showed no significant positive relationships between* Helicobacter pylori *positivity and any gastrointestinal symptoms. These results confirm a significant association between* Helicobacter pylori *and superficial gastritis but suggest that non-ulcer dyspepsia in patients with* Helicobacter pylori *colonisation is probably not a clinically identifiable and distinct syndrome.*

Royal Victoria Hospital, Belfast BT12 6BA.
J A Collins, MD, MRCP (UK), Consultant Physician.

Queen's University of Belfast, Department of Medicine, Institute of Clinical Science, Grosvenor Road, Belfast BT12 6BJ.
A H G Love, MD, FRCP, FRCPI, Professor of Medicine.

Queen's University of Belfast, Department of Pathology, Institute of Pathology, Grosvenor Road, Belfast BT12 6BJ.
J M Sloan, MD, FRCPath, Senior Lecturer in Pathology.
P W Hamilton, PhD, Research Officer.
P C H Watt, MD, FRCS, MRCPath, Consultant Pathologist. (Died 28 December 1990).

Diagnostic Methodology Research Unit, Southern General Hospital, Glasgow.
R P Knill-Jones, MSc, MFPHM, FRCP, Senior Lecturer.
G P Crean, PhD, FRCPEd, FRCPG, FRCPI, Director.

Correspondence to Dr Collins.

INTRODUCTION

In 1983, Warren and Marshall reported a *Campylobacter*-like organism present on the superficial gastric epithelium.[1] Subsequently, the presence of this organism, now named *Helicobacter pylori,* has been closely associated with superficial active gastritis and duodenal ulcer disease.[2-5] However, the association between the presence of this organism and dyspeptic symptoms, particularly in the absence of peptic ulceration, is more controversial. While two human volunteer studies have suggested that ingestion of *Helicobacter pylori* leads to an acute dyspeptic illness,[6-7] few studies have attempted to relate the presence of chronic dyspeptic symptoms to colonisation by this organism in the gastro-duodenal mucosa using an unbiased or blinded study design. In this study, we have examined both antral and fundal endoscopic biopsies from a defined group of patients with non-ulcer dyspepsia and obtained a medical history using an independent, single-bias computer questionnaire or interrogation — the Glasgow Diagnostic System for Dyspepsia (GLADYS) — in an attempt to show significant differences in symptomatology between *Helicobacter pylori* positive and negative subjects.

METHODS

Patients were recruited following presentation to a gastroenterology clinic, with a broad definition of dyspepsia as "episodic, recurrent or persistent abdominal pain or discomfort or any other symptom referable to the alimentary tract, excepting rectal bleeding or jaundice".[8] Exclusion criteria were the ingestion of non-steroidal anti-inflammatory drugs, aspirin, H−2 receptor antagonists, bismuth salts or sucralfate within the previous three months. Patients with a recent history of upper gastrointestinal bleeding within the previous three months and those with a previous history of gastric or duodenal surgery were also excluded. Local ethical committee approval of the protocol was obtained, and written, informed consent was obtained from each patient prior to study participation.

Computer interrogation

Following routine history-taking and clinical examination, patients were asked to complete a computer-based questionnaire using the Glasgow Diagnostic System for Dyspepsia (GLADYS). This system requires the patient to answer a series of questions relating to a series of diagnostic indicants. An individual patient's reponse can then be compared with those of a previously investigated group of patients with various dyspeptic diagnoses from whom diagnostic weights or scores were derived.[9, 10] In this way, the symptoms can be recorded in a single-bias manner without direct assessment by the attending physician or any other observers. The system comprises an Apple II microcomputer with double disk drives linked to a video display unit. A specially built keyboard is used with keys limited in number and clearly labelled for a variety of responses from the patient. Numerical keys permit responses which are selected from a simple list of options. For questions requiring a yes/no response, the keyboard permits three levels of response by having keys labelled "certainly yes/no", "probably yes/no" or "possibly yes/no". The answer to each question is followed by the next relevant question appearing on the screen (obtained from a fixed flow chart relating all questions to prior responses). Each patient was given a brief explanation of the

operation of the keyboard and then completed the interrogation in 20–30 minutes without supervision. Question responses were stored on floppy disk for transfer to a main frame computer for statistical analysis using the Statistical Package for the Social Sciences, SPSSX.

Endoscopy / biopsy

Sixty patients (40 males) underwent computer interrogation and proceeded to upper gastrointestinal endoscopy. Those patients who had normal findings were considered to have non-ulcer dyspepsia. Biopsies were taken from five sites in the gastric antrum 5 cm proximal to the pyloric channel, and three sites in the gastric fundus at a distance of 50 cm from the incisor teeth, as measured on the endoscope shaft. Biopsies were orientated with the mucosal-side downwards on small pieces of dental wax using a needle and hand lens before fixation in 1% formalin solution. Following routine processing, 4 micron sections were stained using the Giemsa technique and independently examined for the presence of *Helicobacter pylori* on the mucosal surface. Both endoscopist and histopathologist were unaware of the results of the computer interrogation. After endoscopy, all patients proceeded to gallbladder ultrasonography to exclude cholelithiasis as a cause of their dyspeptic symptom complex.

Quantitative analysis of biopsies

Using a MOP Kontron Videoplan semi-automatic image analyser, three contiguous microscopic fields were analysed at ×400 magnification in each antral and fundal section for mean polymorph and mononuclear cell number per mm^2 of superficial lamina propria (P/mm^2; MNC/mm^2), by counting individual acute and chronic inflammatory cells within a defined area. A mean value for observations at each site was obtained for antral and fundal gastric biopsies. The mean values for acute and chronic inflammatory cell counts were compared between *Helicobacter pylori* positive and negative subjects with non-ulcer dyspepsia using the Mann-Whitney U-test.

The GLADYS symptom collection was assessed for association of *Helicobacter pylori* infection with symptoms using the Chi-squared test with Yates' correction. A level of $p < 0{\cdot}05$ for significant associations was set.

RESULTS

Of 20 patients diagnosed as non-ulcer dyspepsia following normal endoscopy and negative ultrasonography of the gallbladder, all completed the GLADYS questionnaire, and 18 biopsies suitable for both *Helicobacter pylori* and quantitative inflammatory cell assessment were obtained. Of these 18 patients, nine were positive for *Helicobacter pylori* in the antrum and 10 in the fundus. Mean values for polymorph and mononuclear cell counts at both sites are shown in Table I. The concentrations of both lamina propria polymorphs and mononuclear cells were significantly higher in *Helicobacter pylori* positive subjects ($p < 0{\cdot}01$ Mann-Whitney U-test).

Analysis of results from data collected using the GLADYS computer interrogation in the 18 subjects showed only one association, between the absence of *Helicobacter pylori* on biopsy and gastrointestinal symptoms or demographic

TABLE I

Mean values of lamina propria polymorphs (P/mm²) and mononuclear cells in Helicobacter pylori *positive and negative antral and fundal biopsies in non-ulcer dyspepsia patients using Mann-Whitney U-test*

	Helicobacter pylori *status*	*P/mm²*	*MNC/mm²*
Antrum (n=18)	+ve 9	4·5**	4224**
	−ve 9	2·1	1532
Fundus (n=18)	+ve 10	4·4**	4126***
	−ve 8	1·9	1318

** $p < 0·01$ *** $p < 0·001$

indicants; in the negative patients, there was a significantly higher affirmative response (75%) to a question designated "Are you highly strung or a worrier?" Two or three significant results would have been expected by chance out of the total of 58 symptoms analysed (Table II). There were no significant differences in the frequency of responses between positive and negative patients.

TABLE II

Number of computer-collected indicants analysed between patients positive and negative for Helicobacter pylori *infection*

Symptom / indicant	*Number of indicants in category*	*Frequency comparison between positive and negative* Helicobacter pylori *patients for antrum and fundus*
Demography	6	NS
Pain/discomfort	18	NS
Pain attacks	4	NS
Vomiting	4	NS
Acid reflux	6	NS
Nervous stress	6	$p < 0·05$*
Bowel habit	6	NS
Miscellaneous	8	NS

* $p < 0·05$ for antrum and fundus.

DISCUSSION

The presence of *Helicobacter pylori* in association with gastritis with or without dyspepsia and peptic ulcer has been well documented but the relationship of the organism to symptoms has not been established. Two volunteer studies have suggested that infection with this organism produces an acute polymorph-dominant gastritis which progresses to a chronic form with time,[6, 7] and an outbreak of gastritis in healthy volunteers undergoing nasogastric intubation for acid secretion studies, using inadequately sterilised equipment, may have resulted from such an infection.[11, 12]

Helicobacter pylori infection appears to be a common finding in patients with non-ulcer dyspepsia. One study has reported 70% incidence, compared to 20% in asymptomatic volunteers, and found histological improvement in the gastritis score after therapy.[13] Follow-up of individuals with untreated *Helicobacter pylori*-associated gastritis and non-ulcer dyspepsia has shown persistent infection over 12–28 months, but non-infected dyspeptic patients remained negative but with persisting symptoms over the same period.[14] However, dyspeptic symptoms were not clearly correlated with the presence of the organism in either of these studies. It is surprising that few studies have previously compared dyspeptic symptoms in subjects positive and negative for *Helicobacter pylori.*

Non-ulcer dyspepsia is a commonly encountered gastroenterological disorder in outpatient care but still lacks a clear definition. The relationship of the syndrome to stress-related gastric secretion, functional motility disorders or histologically demonstrated gastroduodenitis has been extensively investigated with inconclusive results.[15–17] The theory that some cases of non-ulcer dyspepsia could be attributed to an infective agent is attractive. Patients defined as non-ulcer dyspepsia usually present with an array of symptoms referable to the gastrointestinal tract and it may be difficult to grade or assess each symptom individually. In this study, we have recorded symptoms in a well-defined group of such patients, all of whom had normal endoscopy and negative gallbladder ultrasonography. The GLADYS system, which has been developed as a screening system for dyspepsia,[9, 10, 18] provides a method of eliciting symptoms without the bias of direct physician contact with the individual subject. Within the study group, subjects were evenly distributed into positive (50%) and negative (50%) on histological assessment for *Helicobacter pylori.* Despite objective grading of biopsies confirming the presence of a significantly higher inflammation in the presence of the organism as noted in previous studies,[2, 3, 13] analysis of dyspeptic symptom frequency between the positive and negative patients produced only one significant negative result, which was identical for gastric antral and fundal biopsies.

There are few similar studies of this type for comparison. Rokkas and colleagues prospectively studied 55 consecutive patients with non-ulcer dyspepsia using direct history-taking and found an association with gastritis, male sex and postprandial bloating in 45% of their group who were positive for *Helicobacter pylori* compared to 15 controls.[19] They postulated that urease activity from the organism could lead to increased intragastric CO_2 production as a cause of gastric gaseous distension. Using a standardised questionnaire, Loffeld and colleagues showed no positive symptomatic associations which could identify 60 non-ulcer dyspepsia patients with *Helicobacter pylori*-associated gastritis and 49 negative subjects, although a marked quantitative association between the presence of the organism and inflammation was again confirmed.[20] The theory that disturbed gastric motility is a possible cause of non-ulcer dyspepsia in association with bacterial colonisation was recently investigated by Wegener and colleagues.[21] They were unable to show a significant delay in gastric emptying between *Helicobacter pylori* positive and negative patients, although both groups had emptying significantly delayed compared to asymptomatic controls. The largest survey to date used a standard symptom questionnaire to collect symptom data in 251 dyspeptic patients, of whom 65 had peptic ulceration and 186 non-ulcer dyspepsia,[22] and did not find a clinically distinct syndrome in the patients positive for the organism.

We have used a single-bias computer questionnaire combined with quantitative histology to survey patients with non-ulcer dyspepsia. Our results support a close association between chronic active gastritis and the presence of *Helicobacter pylori* in the gastric mucosa but there are no significant symptom relationships which point to a distinct non-ulcer diathesis related to this organism. Despite continued interest in this association, there is no report to date showing any clinical pointer of value. Serological tests show promise as a non-invasive method of detection of *Helicobacter pylori,*[23] and the therapeutic effect of eradication of this organism in these patients is awaited.[24] Single bias symptom assessment techniques as described are important in the analysis of symptoms in this difficult area.

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Outcome following proximal femoral fracture in the elderly female

T R O Beringer, D H Gilmore

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SUMMARY

Outcome after proximal femoral fracture was assessed in 89 elderly females. Mortality both in hospital and subsequent to discharge was identified, with a mortality rate of 13·5% at 30 days and 35% after one year. The median length of stay was 28 days, with 40% of subjects transferred for geriatric-orthopaedic care. Delay prior to surgery and its relationship to increased mortality was highlighted. The importance of the fracture population and its selection and influence on outcome is discussed, indicating the need for caution in comparative audit.

INTRODUCTION

Fracture of the proximal femur is a common condition in the elderly, affecting 12% of women by the age of 85 years and carrying a high morbidity and mortality.[1, 2] In addition the incidence of this fracture is increasing more rapidly than would be expected as a result solely of the steady increase in the elderly population.[1, 3–6] Together, these and other factors result in proximal fracture presently occupying 25% of orthopaedic beds,[2] with the attendant hospital costs further increased by subsequent community care.

Alongside the need to identify the causes of proximal femoral fracture, in particular the roles of reduced bone mass, bone quality and prevention of falls, it is essential that the present care of the elderly presenting to hospital is appropriate and effective. This is especially so as the demographic ageing of the population alone will result in a further 25% increase in the numbers of elderly females presenting with hip fracture in the coming decade in greater Belfast. The recognition of the need for collaboration between orthopaedic surgeons and physicians in geriatric medicine has led to the development of either liaison services or orthopaedic geriatric units of varying design.[7–13] Other innovations include a rapid transfer system[14] or use of a "hospital at home" nursing service.[15]

In the Royal Victoria Hospital, Belfast, a geriatric orthopaedic ward round takes place every week in the acute orthopaedic unit. The resultant selective transfer of

Geriatric Medical Unit, Royal Victoria Hospital, Belfast BT12 6BA.
T R O Beringer, MD, MRCP, FRCPI, Consultant Physician.
D H Gilmore, MB, MRCP, Consultant Physician.
Correspondence to Dr Beringer.

patients for further rehabilitation to the setting of geriatric hospital beds has been the established pattern of care. This study presents and examines some of the outcomes of this scheme, including survival and length of hospital stay.

PATIENTS AND METHODS

The fracture unit of the Royal Victoria Hospital receives patients on a rotational basis shared with the other Belfast hospitals. All consecutive females admitted in 1987 from greater Belfast over the age of 65 with proximal femoral fracture were enrolled in this study. Assessments were performed on a weekly ward round by a geriatrician accompanied by the orthopaedic house surgeon and ward sister, and if recovery following surgery was considered to be inadequate or slow, transfer was arranged to a separate geriatric medical facility under the care of a consultant physician in geriatric medicine. Patients are required to be medically fit for transport by ambulance prior to such transfer. Patients deemed to be progressing satisfactorily to enable discharge to the residence from which they were admitted remained in the acute orthopaedic unit and advice was provided as necessary regarding changes in medical management or paramedical involvement. Information was also gathered at assessment regarding pre-admission drug therapy, social circumstances, type of dwelling and level of independence. In addition the type of fracture and date of surgery were noted. The data was updated at each weekly review, place and date of discharge were recorded, and survival documented from general practitioner or hospital records.

Patients transferred to the geriatric medical unit were cared for in a inter-disciplinary team approach led by a consultant physician in geriatric medicine, with active participation of the physiotherapy, occupational therapy and social work disciplines. The nursing staff endeavoured to promote and encourage the achievement of independence in the activities of daily living. Home visit assessments were carried out if indicated prior to discharge, and follow-up arranged at a geriatric day hospital or outpatient clinic.

RESULTS

Age

A total of 89 females were admitted to the acute orthopaedic unit with a mean age of 83·3 (range 71–94) years. Subsequently 11 patients died in this unit (mean age of 86·8 years), 40 were discharged directly home (mean age of 80·9 years) and 38 transferred to the geriatric unit (mean age of 84·2 years).

Length of stay

The mean length of stay for the 89 patients was 42 days (median 28 days). The mean length of stay of the 40 patients discharged directly home was 26·6 days (range 2–120), and 18 days (range 1–76) for the 11 patients who died in the acute orthopaedic unit. The remaining 38 patients were transferred to the geriatric medical unit after a mean length of stay of 20·9 days (range 6–94) in the acute orthopaedic unit and remained in the geriatric medical unit for a further mean stay of 44·4 days (range 2–334). (Table I).

TABLE I

Outcome in the 89 patients with fracture of the proximal femur

	Discharged direct from orthopaedic ward	*Discharged from geriatric medical unit*	*Discharged to long term care*	*Died in orthopaedic ward*	*Died in geriatric medical unit*
Number	40	30	3	11	5
Mean age in years	80·9	83·7	88·0	86·8	85·2
Mean length of stay in days (orthopaedic)	26·6	18·3	42·6	18·0	22·6
Mean length of stay in days (geriatric)	—	29·7	195·3*	—	41·8
Total mean length of stay in days	26·6	48·1	238·0	18·0	64·4
Total median length of stay in days	19·0	37·5	242·0	11·0	34·0

*Remained in care until death.

Time of surgery

Surgical operation was undertaken in 79 patients, 27 within one day of admission, 25 between one and two days, and 27 waited more than two days (Table II). Those in whom surgery was delayed up to two days were significantly older with a substantially higher hospital mortality of 28%. Surgery was not performed in three patients with stable painless impacted sub-capital fractures. Seven patients were considered medically unfit for surgery, of whom six subsequently died in hospital after a mean length of stay of 6·8 days (range 1–15) and one patient returned to the psychogeriatric unit from which she had been admitted.

TABLE II

Surgical delay following admission of elderly women with proximal femoral fracture (n = 79)

	Days after admission		
Days	*0–1*	*1–2*	*2+ (range 2–14)*
Number of patients (% of total)	27 (34%)	25 (32%)	27 (34%)
Mean age in years	80·3	84·1	81·0
Number of hospital deaths (%)	3 (11%)	7 (28%)	3 (11%)
Mean length of stay in days	25	62	49
Median length of stay in days	27	34	32

Outcome

A total of 40 patients were discharged directly from the acute orthopaedic unit, 29 (72·5%) home and 10 returned to long term psychogeriatric and nursing home care from which they had been admitted, with one new placement in

nursing home care. A total of 30 patients were discharged from the geriatric unit, 25 (83%) to return to their homes, four to residential homes from which they had been admitted, with one new placement in residential care. Three patients in whom further clinical improvement was considered unlikely and who had not responded to rehabilitative measures were deemed to require long term hospital care.

Sixteen patients died in hospital, 11 in the fracture ward and a further five after transfer to the geriatric medical unit. The overall hospital mortality was 17·9%. The one year survival was 65% and the two year survival 59% (Figure).

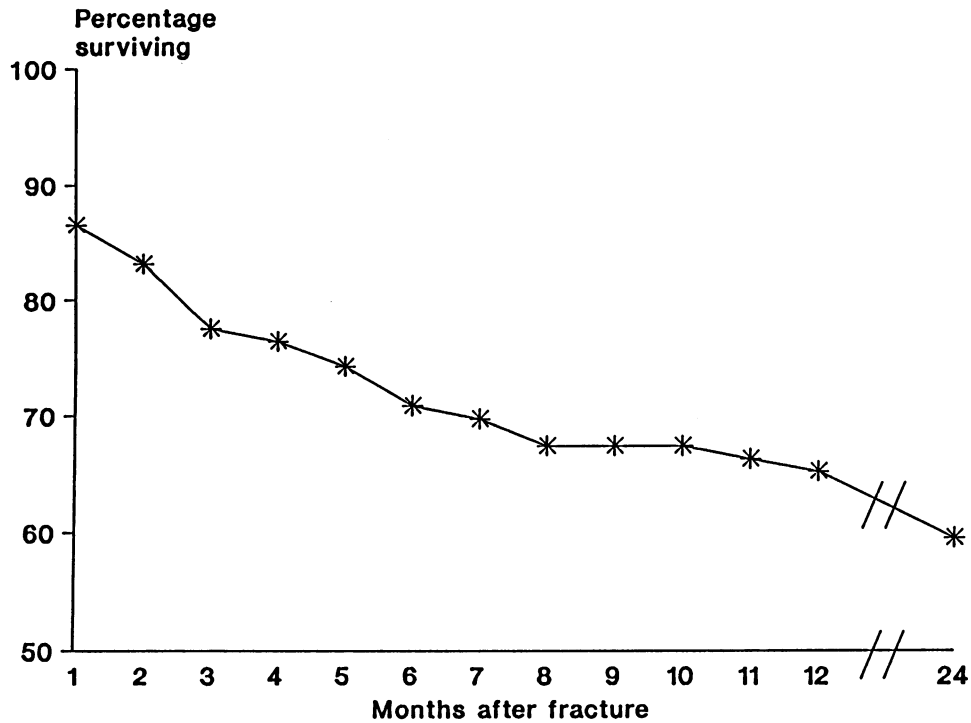

Figure. Survival (%) after hip fracture in 89 elderly females.

DISCUSSION

It is important to emphasise that this study describes the outcome of an unselected population of elderly women over the age of 65 years admitted with proximal femoral fracture. This is in contrast to other studies which may exclude patients admitted from other hospitals [12] or who are unfit for transfer.[11] If the fracture populations studied differ in their selection then this will also alter the outcome, and comparisons must therefore be made with caution. The hospital mortality in this study of 18% refers to a mean length of stay of approximately six weeks, and is similar to the 20·1% reported from Nottingham in 1982,[8] the 21% in Belfast in 1984,[16] and 17% after 30 days in Dorset.[17]

The mean length of stay in Belfast continues to fall from approximately 80 days in 1969,[18] 53·9 (median 32) days in 1981 and 1982 [19] to the present figure of 42 (median 28) days in this study. This present median length of stay approaches the median stay of 24 days in the intervention group rather than the 41 days in the control group reported in a clinical trial of geriatric rehabilitation in Stirling,[11] and the mean length of stay of 42 days is similar to the 44 days reported from an orthopaedic geriatric inpatient service in Glasgow.[12] It would appear from these comparisons that the present system of selective transfer to geriatric care in Belfast operates favourably in terms of length of stay.

One area highlighted in this study is the delay prior to surgery. It has previously been reported that delay may result in increased mortality.[20] While in this study 66% of subjects were operated on within 48 hours in comparison to 48% 2–3 days after admission in London,[21] this is still poor in comparison to the 78% within 24 hours and 90% within 48 hours from Glasgow.[12] Those patients delayed in our study for up to two days carried a much increased mortality of 28% in comparison to the mortality of 11% of those treated surgically within 24 hours, and also a greatly prolonged length of stay. Although part of this difference is due to pre-existing conditions requiring treatment prior to anaesthesia, supported by the higher mean age of those on whom surgery was delayed, reducing this surgical delay in those fit for earlier anaesthesia will result in a reduction of morbidity and mortality. In addition, this reduction of surgical delay will allow a proportional shortening of hospital stay [22] and a swifter introduction of rehabilitation.

Analysis of outcome revealed that a total of 54 (61%) of all admissions were successfully discharged home, with 72% of live discharges from the fracture ward and 83% from the geriatric medical unit returning home. These differences result from a higher proportion of direct discharges from the orthopaedic unit returning to nursing and psychogeriatric care from which patients were admitted, but do highlight the large proportion of patients who may be successfully rehabilitated and discharged to their own home. This is further supported by the finding that only three subjects required long term hospital care, one nursing home care and one residential care as a consequence of the fracture. Approximately 6% of elderly hip fracture patients will require alternative placement on discharge and it is important that this decision is reached only after a full programme of rehabilitation to prevent inappropriate institutional care.

The 35% mortality one year after hip fracture in the elderly is significantly higher than the expected annual mortality of 80-year-olds of approximately 4–5%. The mortality after hip fracture appears to fall to the expected rate only after approximately six months, in comparison to previous studies reporting an interval of two months,[23] three months [24] as well as six months.[25]

The one year survival after fracture of 65·2% is comparable to the 67% survival reported from the elderly in Stirling [26] and 58% from Dorset.[17] This is in contrast to a previous report from Belfast in 1986 with a low six month mortality of 15% suggesting that not all elderly subjects were enrolled following fracture.[27] The remarkably low one year mortality of 17·4% in Baltimore [25] may in part reflect the inclusion of only the elderly residing in the community at the time of fracture, excluding the frail elderly in institutional, residential and nursing home care.

Similarly, divergent lengths of stay in two hospitals in Newcastle upon Tyne were attributed in part to differences in the populations admitted with a fracture.[28] It is clear from these studies that before comparisons of outcome and length of stay are made, the nature of the fracture population and its selection must be clearly identified and delineated. This example of femoral neck fracture indicates the need for care in the audit of hospital treatment of other more complex conditions.

This study highlights the high mortality of 29% in the elderly in the first six months after hip fracture. The present pattern of selective transfer of 40% of the elderly after hip fracture for inter-disciplinary geriatric rehabilitation enables a high proportion of survivors to return to their own homes. Further improvements in outcome with reduction of length of stay will occur if improved organisation allows surgery to be undertaken within 24 hours of admission in subjects fit for anaesthesia.[2] With the projected increase in the number of elderly who will present with femoral fracture, increased efficiency in the use of resources is essential to ensure improvements in the quality of care and outcome.

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Systemic neonatal candidiasis

M Reid, N Rollins, H Halliday, G McClure

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SUMMARY

Forty-five cases of systemic neonatal candidiasis were diagnosed over a 9-year period in a neonatal intensive care unit; 42 infants weighed less than 1·5 kg. All had been very ill with preceding bacterial sepsis and other complications of low birthweight. Where treatment was instituted the mortality was low (4 out of 39 dying) and complications of treatment were transitory. We therefore recommend diligent examination for the presence of this infection, and treatment with a combination of amphotericin B and 5-flucytosine.

INTRODUCTION

Sepsis remains an important cause of morbidity and mortality in the newborn infant; especially so in infants of low birth weight requiring intensive care.[1] Systemic candidiasis has become recognised as a significant cause of sepsis in our unit over the past 9 years, and we have therefore analysed data on the 45 cases that have occurred during that period.

METHODS

Forty-five patients were diagnosed over a 9-year period (July 1980 — July 1989) as having systemic candidiasis in the Neonatal Intensive Care Unit, Royal Maternity Hospital, Belfast. The diagnosis was established by the culture of candida from venous blood and/or the finding of budding yeasts in urine obtained by suprapubic aspiration, followed by subsequent culture of candida. Cases diagnosed at postmortem by the finding of candidal abscesses in lung, brain, heart and liver were included where the diagnosis had not been made antemortem.

RESULTS

Forty-five infants (Table) were found to have systemic candidiasis. All were pre-term, and less than 35 weeks gestation. Twenty-three were very immature, being $\leqslant$ 27 weeks gestation. Consequently the babies were small and 20 weighed less than 1·0 kg. All the infants prior to the diagnosis of candidiasis had been very ill

Neonatal Intensive Care Unit, Royal Maternity Hospital, Belfast BT12 6BB.
M Reid, MB, FRCP(G), Consultant Paediatrician.
N Rollins, MB, DCH, Senior House Officer.
H Halliday, MD, FRCP(Ed), Consultant Paediatrician.
G McClure, MB, FRCP(Ed), Consultant Paediatrician.
Correspondence to Dr Reid.

TABLE

Clinical details on 45 infants with systemic candidiasis

	Mean	Range
Gestation (weeks)	27·7 ± 2·3	25 – 34
Weight	1105 ± 342	537 – 2440
Age at diagnosis (days)	35 ± 20	9 – 80
Positive cultures:		
Blood	36	
Urine	27	
Blood and urine	19	
CSF	6	
Complicating disease:		
Bronchopulmonary dysplasia	16	(37%)
Patent ductus arteriosus	17	(40%)
Congenital malformation	3	(7%)

with proven bacterial sepsis, the majority (84%) with staphylococcal septicaemia (*Staphylococcus aureus*). All had received at least three courses of antibiotics, with a mean of 5·5 courses. Forty (93%) had received cephalosporin treatment as part of the antibiotic therapy. All had received periods of assisted ventilation in the treatment of respiratory failure secondary to respiratory distress syndrome, pulmonary immaturity or pneumonia. Many had complications including bronchopulmonary dysplasia or patent ductus arteriosus, prolonging their inpatient stay, and increasing their morbidity. The great majority had the diagnosis made on blood culture, and a number also had yeasts seen on direct examination of the urine prior to culture. Less than half had combined positive urine and blood cultures.

With the exception of those babies who were diagnosed at postmortem, the mean age at diagnosis was 35 ± 20 days with a range from 9 – 80 days. All the infants had at some time arterial catheters, either umbilical or radial, *in situ,* but only three infants had arterial catheters *in situ* at the time of diagnosis. Although all infants were receiving intravenous feeding none had central catheters present at the time of diagnosis.

There were 10 deaths. The diagnosis was established in five infants at postmortem; these infants were the first in our series and in one, although fungi were found in tissues at postmortem, the main cause of death was a coliform meningitis; the other four infants probably died from the effects of disseminated candidiasis, the organism being found widely spread throughout lung, brain, heart and liver. Of the other infants who eventually died following clinical and laboratory diagnosis of infection, two died from respiratory failure secondary to bronchopulmonary dysplasia, one from a complex cardiac malformation, one from sudden infant death syndrome after discharge from hospital, and one from candidiasis.

The incidence of infection increased during the nine-year period reaching a maximum of 10 cases in 1987. The most frequent presenting sign was apnoea, seen in 21 infants, while in a further 21 the combination of lethargy, temperature instability, colour change and hyperglycaemia was also seen. Seven presented with abdominal distension, three with sclerema; most infants had more than one sign or symptom.

The infants were treated with a combination of amphotericin B between 0·1–0·5 mg/kg/day and flucytosine 100 mg/kg/day in two divided doses. The mean length of treatment was 18 days, ranging from 1–42 days. None suffered any obvious severe acute or long-term toxic effects from these drugs, with the exception of a transient rise in liver enzymes in 15, and in a further eight a fall in platelet count below 100,000 cu mm during periods of treatment. Amphotericin B and 5-flucytosine levels were assayed, but levels above therapeutic recommendations were not detected. Where treatment was instituted the outcome was relatively satisfactory, in that only four of the 39 infants that were treated died. One infant was not treated in view of his moribund state. On examining the cause of death of those babies who died, it is probable that only one died from candidiasis, the others dying some time after the infection had been eliminated, and from some other disease or pathological condition.

Twenty-four of the 41 infants were known to be colonised with *Candida spp.* prior to the diagnosis of systemic spread, a higher proportion than that found by Faix et al.[2] Five of our patients were colonised at birth and the remainder in the subsequent two weeks. Therefore we now treat all infants in long-term intensive care with oral nystatin routinely where *Candida spp.* has been grown from superficial swabs.

All the surviving infants have been followed up as outpatients. The oldest child at the time of the last examination was aged 6 years and the youngest less than 6 months. Of the 29 infants of more than one year of age, 23 appeared to be making adequate physical and developmental progress, four had moderate developmental delay and two had cerebral palsy; whether these problems can be attributed to candidiasis or other complications occurring during the perinatal period is impossible to say.

DISCUSSION

Systemic candidiasis represents an important cause of morbidity and mortality in our patients. It occurred in approximately 0·5% of low birth weight infants, but was found in 11% of those weighing less than 1·0 kg. Very low birth weight has also been recognised as important by Johnson et al[1] and Faix et al.[2] The signs and symptoms observed in these babies mimic bacterial sepsis, emphasising the importance of routine fungal as well as bacterial culture in the investigation of possible sepsis in infants of low birth weight, particularly those weighing less than 1·5 kg.

It is encouraging that despite using drugs thought to be potentially toxic in adults, none of the infants appeared to have suffered long-term ill-effects from amphotericin or flucytosine. Some infants may have had transient hepatic and haematological changes, but these findings may be related rather to the infection than to the medication given. Smith and Congdon[3] have commented on the

difficulty of obtaining positive blood cultures, but we found the reverse: there were more infants with positive blood cultures than with positive urinary findings. A minority had both positive urine and blood findings. It remains to be seen whether routine treatment with oral nystatin will significantly reduce the incidence of local or systemic candidiasis either by its removal from the gut after birth, or by reducing the incidence of cross-infection. At present we start treatment with nystatin in those infants from whom *Candida spp.* are cultured and who are in need of intensive care.

The main factors predisposing to infection in these infants appear to be their low birth weight, their associated immunological immaturity and the breaching of their physical defences following long periods of intensive care, during which they undergo invasive treatments such as artificial ventilation and vascular catheterisation. The infants in our series who developed this infection were a more ill group than the other infants treated in the unit over the same period; 100% required ventilation as against 43%; 37% had bronchopulmonary dysplasia against 17%, and 40% had patent ductus arteriosus against 13% of the comparative population. Despite the fact that 20 of these babies were less than 1 kg, 14 survived, a rate similar to babies weighing less than 1 kg who were cared for in the ward during the period under consideration.

We see little prospect of this infection being eliminated, in view of the increasing numbers of low birth weight infants at present surviving. Long periods of intensive care, due to the development of more sophisticated methods of treatment, including better perinatal management and surfactant administration is the major risk factor. We suggest that a high degree of awareness be maintained regarding the possibility of this infection, and that the appropriate examination and cultures of specimens from patients who may present with the rather vague clinical signs and symptoms described be carried out. Where possible, vascular catheterisation should be avoided, and most important of all, antibiotics should be given only under sound bacteriological advice for minimal periods of time. The Editor of the Year Book of Pediatrics (1986)[5] commented laconically "Some of these infants of extremely low birth weight remain in the nursery so long, is it any wonder that they become mouldy?"

We are appreciative of the helpful advice from Dr Hugh Webb and his colleagues in the Bacteriology Laboratory, Royal Victoria Hospital, who undertook the culture of the specimens.

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Postoperative dental pain — a comparative study of anti-inflammatory and analgesic agents

W I Campbell, R W Kendrick

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SUMMARY

Intravenous dexamethasone and diclofenac were evaluated in a double blind randomised trial, relative to an opioid (pentazocine) and placebo (saline), in 160 patients undergoing extraction of impacted lower third molar teeth. Test drugs were administered intravenously before surgery to provide postoperative analgesia. Following the operation, pain was assessed using a 10 cm visual analogue scale.

Patients who received diclofenac reported significantly less pain than others 30 minutes after surgery ($p < 0{\cdot}05$). Pain scores on the day following surgery were also significantly lower in the diclofenac group compared to the opioid and placebo groups ($p < 0{\cdot}05$) but not less than those who received dexamethasone — possibly indicating a long term advantage of the anti-inflammatory drugs. Vomiting was a problem in the opioid group.

INTRODUCTION

In an attempt to reduce the discomfort following oral surgery, steroids have been used by some oral surgeons.[1] Non-steroidal anti-inflammatory drugs have been shown to be effective in managing postoperative dental pain and are used widely for this purpose.[2] This study was aimed at determining the efficacy of anti-inflammatory agents, both steroidal and non-steroidal, in managing the pain following oral surgery. Since these agents are more effective when given before tissue disruption, they were administered intravenously, approximately 10 minutes prior to surgery.[3]

METHODS

One hundred and sixty fit (American Society of Anesthesiologists Grade I) patients admitted for extraction of two mandibular wisdom teeth under general anaesthesia were studied. The subjects were aged between 16 and 65 years and gave informed verbal consent. Approval for the study was granted by the Research Ethical Committee, The Queen's University of Belfast.

The Ulster Hospital, Dundonald, Belfast BT16 0RH.
W I Campbell, MD, FFARCSI, Consultant Anaesthetist.
R W Kendrick, MB, FDSRCPS, FFDRSCI, Consultant Oral Surgeon.
Correspondence to Dr Campbell.

All subjects were premedicated with 10 mg oral diazepam and randomly assigned to receive one of the following on a double blind basis — normal saline, pentazocine 0·4 mg/kg (30 mg maximum), dexamethasone 0·15 mg/kg (12 mg maximum) or diclofenac 1 mg/kg. Each test agent was within a coded 3 ml vial and diluted to 20 ml prior to intravenous injection. Induction of anesthesia was with propofol 2 mg/kg and muscle relaxants to facilitate tracheal intubation. Maintenance of anaesthesia was with nitrous oxide and halothane in 40% oxygen.

Co-codaprin (dispersible aspirin and codeine) tablets and levorphanol for intramuscular injection were available postoperatively as deemed necessary by the nursing staff in the recovery ward. Co-codaprin was also available to all subjects on a "4-hourly as required" basis.

Postoperative pain was assessed using a 10 cm visual analogue scale by staff trained in its use. The first pain assessment was carried out 30 minutes postoperatively by one of two recovery ward nurses prior to patients receiving any postoperative analgesia. A further assessment of pain was carried out by one of two dental housesurgeons on the morning following surgery. Analgesic requirements and postoperative vomiting were also recorded. On completion of surgery the operator rated surgical difficulty as simple elevation without bone removal, simple elevation after minimal bone removal, wide bone removal or tooth section, or wide bone removal and tooth section.

Comparability of the groups was assessed using one-way analysis of variance or Chi squared tests as appropriate. The visual analogue score results were also compared using analysis of variance after arcsin transformation to produce a parametric distribution. The 5% level of significance was used throughout.

RESULTS

All groups were comparable with respect to age, sex, weight, duration of operation and surgical difficulty. Visual analogue pain scores 30 minutes after completion of surgery indicated that the diclofenac group suffered less pain ($p < 0·05$) than all other groups (Table).

In those patients (29–33 in each group) who stayed overnight, pain scores were lower in the dexamethasone and diclofenac groups ($p < 0·05$). The opioid requirements postoperatively were not significantly different between groups. Many of the patients in the diclofenac group did not require any form of postoperative analgesia, which was significantly less than for the placebo or dexamethasone groups ($p = 0·03$). The incidence of vomiting was significantly higher in the pentazocine group relative to the others ($p < 0·01$).

DISCUSSION

Acute pain following body surface surgery is accentuated by various substances, such as bradykinin and prostaglandins, released during tissue damage. Bradykinin is considered to sensitise nociceptors and this activity is accelerated by the presence of prostaglandins.[4,5] The non-steroidal anti-inflammatory drugs inhibit this activity and reduce pain intensity, sometimes to the extent of providing better analgesia than opioids,[6] which we have confirmed in this study.

TABLE

	saline	*pentazocine*	*dexamethasone*	*diclofenac*
Characteristics of the four groups (mean ± SD)				
Surgical difficulty				
— grade (1)	2	1	2	1
(2)	23	19	18	18
(3)	11	15	17	16
(4)	4	5	3	5
Age: yr	24·3± 6·4	25·6± 6·7	23·8± 5·1	24·9± 6·8
Sex: M : F	18 : 22	20 : 20	17 : 23	21 : 19
Weight: kg	65·8±11·3	65·5±10·9	64·9±13·1	66·5±12·3
Duration of operation: min	36·9±11·7	38·1±10·9	38·9±12·9	37·5±11·5
Postoperative pain intensity (visual analogue scale: mean (lower and upper quartile)				
At 30 minutes	53 (33, 75)	56 (44, 74)	55 (44, 78)	28 (22, 47)
n	40	40	40	40
At day 1	17 (9, 38)	23 (18, 36)	13 (9, 20)	11 (4, 19)
n	31	33	29	33
Analgesic usage postoperatively				
Nil	5	9	5	13
Co-codaprin	29	25	27	24
Levorphanol	6	6	8	3
Vomited	3	16	6	3

Dexamethasone is an extremely potent anti-inflammatory steroid but the tissues must be relatively intact, as it is almost inactive in the cell-free prostaglandin synthetase system.[7] Tissue swelling is markedly reduced when dexamethasone is administered in adequate doses (10–20 mg iv),[1, 8] although the postoperative analgesia achieved in one of these studies may in part be due to competitive inhibition of a common metabolic pathway in the liver for steroids and opioids.[8]

Although contraindicated in various disease states, both non-steroidal anti-inflammatory agents and systemic steroids are considered valuable in the management of postoperative swelling, trismus and pain.[2, 9] The intravenous use of all test drugs just prior to surgery permitted high tissue levels to be achieved at an optimum time in this study. The manufacturers of diclofenac do not recommend intravenous use of their intramuscular preparation, due to an inadequate body of knowledge regarding this route (personal communication) but the drug has been successfully used intravenously in various clinical situations.[10, 11] The intramuscular preparation of diclofenac contains the solvent

1,2 propylene gycol which is probably responsible for the high incidence of venous thrombosis.[12] A dilution of the drug by at least fivefold greatly diminishes this problem, hence the dilutions used for all test drugs.

Pentazocine has been used satisfactorily for many years in the management of postoperative dental pain in this hospital. When the study commenced it was not a controlled drug, therefore avoiding legal technicalities in coding an opioid analgesic.

Nausea and dizziness may follow opioid administration[13] and in this study the incidence of vomiting was particularly high in the pentazocine group (vomiting is a definite end point so it alone was observed — not the combination of nausea and vomiting). The other active test drugs are considered to work at a peripheral level and sickness was not a problem. Only two measures of pain were carried out since supplementary analgesia is required by most individuals shortly after they waken following this type of surgery. A pilot study indicated that the first measure of pain is best made 30 minutes postoperatively as analgesics are given to most individuals after this period. Further measures are of little value until the following day, when all subjects are in a similar situation regarding analgesic use. Although coagulation disturbances can occur following the use of aspirin-like drugs, this was not observed in any case.

We conclude that both dexamethasone and diclofenac are capable of reducing postoperative discomfort on the day following oral surgery. Although dexamethasone is a potent steroid and capable of reducing oedema, it does not provide significant analgesia in the immediate postoperative period in the dose and manner used in this study.

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Non-attendance at a psychiatric day hospital new patient clinic

A O'Neill, A Kerr

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SUMMARY

People who do not attend for treatment present problems in the efficient running of any service. This is particularly the case with new patients referred to a psychiatric clinic where an hour may be set aside for the initial assessment. High non-attendance rates cause administrative problems and loss of valuable time. The referring doctor may be left with his patient unassessed, the patient may miss valuable treatment or advice, and an incorrect assessment of the true prevalence of some disorders may be made.

INTRODUCTION

Much investigation has concentrated on people who, having engaged in treatment, subsequently default. A major review[1] has pointed out the difficulties associated with this style of research. The variables associated with dropping out are compounded by treatment factors, the interval between appointments, the patient-doctor relationship and drug side-effects. This makes it difficult to come to any firm conclusions without using large numbers. By looking at new patients, particularly those who have never had any previous contact with the psychiatric services, we hope to be able to identify the simplest and most informative factors associated with initial non-attendance. The patients in this study were consecutive new patient referrals to the Albertbridge Road Day Hospital in East Belfast over the period of one year.

METHODS

A note was taken of all new referrals who did not attend during 1988. There were 267 new referrals, of which 40 (i.e. 15%) did not attend. A search was made of records in other psychiatric hospitals in the district to ensure they had not been seen previously. The referral letters were scrutinised for data which was considered to be of possible importance, such as sex, age and the distance the patient lived from the clinic. The agency of referral (general practitioner, hospital colleague or domiciliary visit) together with the sex and year of qualification of the general practitioner concerned were noted. Further information gleaned from

Albertbridge Road Day Hospital, 225 Albertbridge Road, Belfast BT5 4PX.

A O'Neill, MRCPsych, formerly Senior House Officer, Albertbridge Road Day Hospital. Now Senior Registrar in Psychiatry, Department of Mental Health, The Queen's University of Belfast.

A Kerr, FRCPI, DPM, FRCPsych, Consultant Psychiatrist.

Correspondence to Dr Kerr.

the referral letters, such as marital disharmony, possible diagnosis and whether the referral letter was sent to a named consultant psychiatrist at the clinic was recorded. The results were compared with a randomly selected group of attenders. A questionnaire was also sent to each non-attender in which they were asked to give a reason, or reasons, for their failure to take up their appointment.

RESULTS

There was no difference between attenders and non-attenders with respect to sex, age or distance from their home address. While there was a small excess of non-attenders from the working class area, the number of referrals precluded detailed statistical analysis. (A working class area was defined as an area of high density of small housing where most of the inhabitants are wage earners). The diagnosis in both groups was remarkably similar, but if the referring doctor specified a particular consultant psychiatrist the patient was significantly more likely to attend ($p < 0{\cdot}02$) (Table).

TABLE

Information obtained on patients referred to the psychiatric day hospital to compare those who did and did not attend for their appointment

	Non-attenders	*Attenders*	
Diagnosis			
Anxiety	16	20	
Depression	9	11	
Neurosis	3	4	
Alcohol	3	2	
Schizophrenia	2	1	
Other	5	2	
Marital problems			
Yes	16	9	NS
No	22	3	
Referral to named doctor			
Yes	7	18	$p<0{\cdot}02$
No	31	22	

Patients were likely to attend if they had been previously seen on a domiciliary visit but again this tendency was not significant. There was a marked difference in the times the patient had to wait before the arranged appointment, with an excess of attenders compared with non-attenders in those whose appointment was arranged within a week and of non-attenders compared with attenders when the patient had to wait seven weeks or longer (Fig 1). The average waiting time was longer in the non-attenders (34 days) compared to attenders (22 days). This was significant at the $p < 0{\cdot}02$ level (student t tests $t = 2{\cdot}24$).

The percentage non-attenders by month (Fig 2) showed peaks in April, July and September.

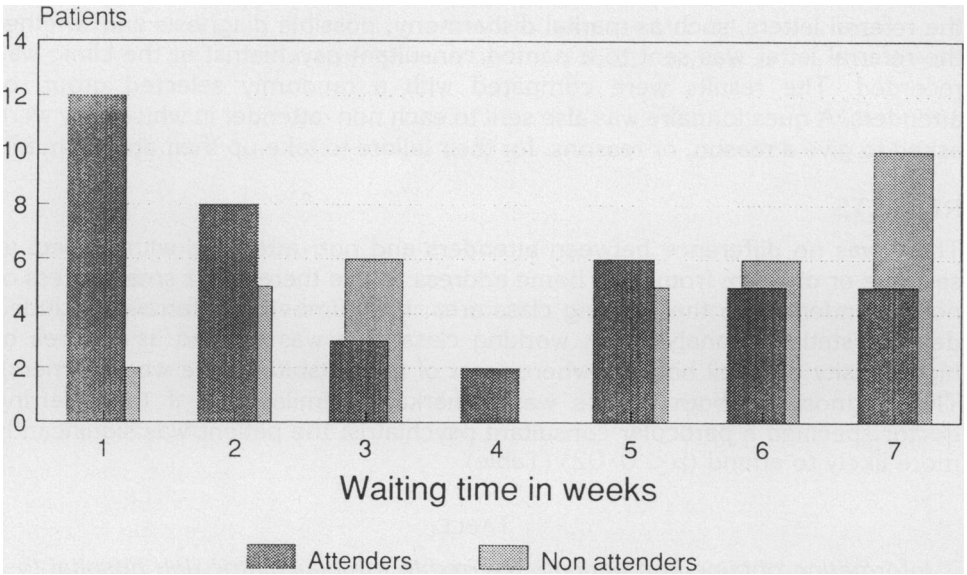

Fig 1. Waiting time in weeks for 40 non-attenders and a selected control group of patients who did attend for their first psychiatric referral.

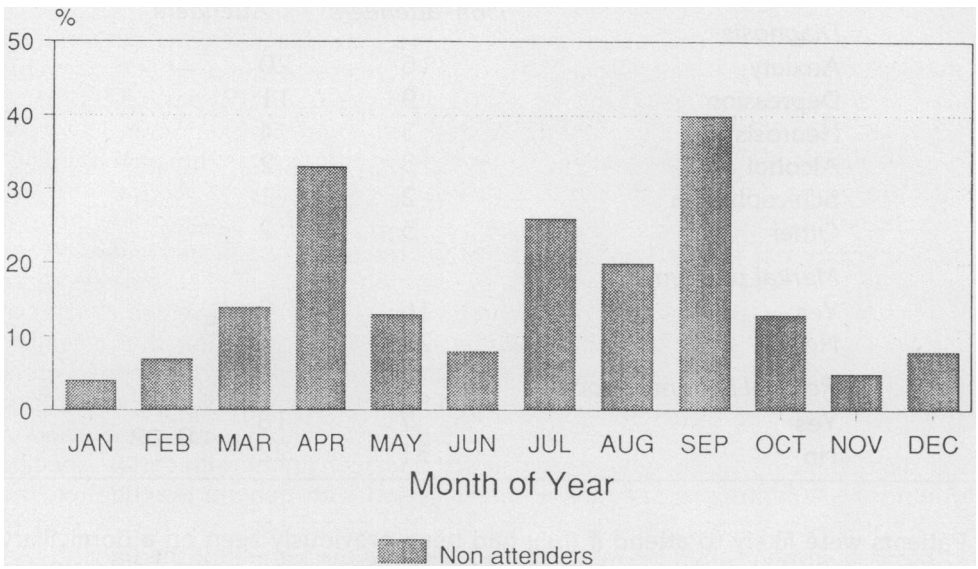

Fig 2. Non-attendance at first psychiatric referral by month of year.

There were only 14 replies (38%) to the questionnaire sent to non-attenders. There was a genuine concern expressed by some patients of being unhappy and unsure about the nature of the treatment available at the clinic; 35% said they were afraid of treatment, 42% felt uneasy discussing treatment, and 60% said they would have liked more information. Seventy one per cent of those who replied gave the excuse that they did not require to attend as their illness had

improved during the waiting period for the appointment. Delay in getting the appointment was mentioned by 42% of non-attenders.

DISCUSSION

With the current interest in medical audit, this study could be of some importance for future planning and assessment of psychiatric services. The variables which contributed significantly to the rate of non-attendance were referral to a named doctor and waiting time. These two variables were independent as personal referrals had on average longer waiting times. Other factors which did not reach significance but weighed towards non-attendance were marital problems, young male patients and not having a domiciliary visit prior to referral. The variations during April and the summer months were due to staff and patient holidays (and children at home from school), which led to longer waiting times.

Personal, demographic and illness variables contribute very little to the overall non-attendance figures. Similar studies have pointed towards the same broad conclusions; Burgess and Harrington[2] found waiting time and consultant referral important, although they also found civil status and certain diagnostic categories had an effect. Hoenig[3] found specific consultant referral and waiting time, particularly after the first week, important. In different populations and with different mental health facilities there is consistent evidence that the mechanism of the referral system predicts non-attendance.

This study confirms that personal referral is an important factor in determining attendance at a day hospital. It may be that the general practitioner reinforces his initial contact with the patient with positive comments about that particular doctor. Alternatively the patient may initiate the referral, suggesting a doctor, leaving a mental picture of a doctor waiting, rather than an anonymous hospital building. Encouraging more personal contact between the agency of referral and the hospital is important. Changing the referral form to encourage more thought about whom the patient would be seeing and what forms of treatment are available at that clinic would also put an onus on the hospital to provide more information, thereby improving communication. This was suggested by one of us, in a previous study of non-attenders,[4] with the conclusion that attention should be paid to providing closer liaison between hospital and patient before attendance, with a more informative and realistic appointment system in the East Belfast district. A sectorised psychiatric service has recently been established in this district in which a consultant psychiatrist has been linked with certain specific primary care centres to encourage closer liaison with general practitioner, the community psychiatric nursing service and the social services. It is hoped to improve communication between all disciplines to the benefit of the patient.

The replies to the questionnaire showed that 71% of the people felt that their illness had improved during the waiting time for the appointment. This provides evidence for those in favour of a longer waiting list as a filter for unnecessary referrals. However 50% of those who replied, including many who had improved, felt that they were still ill enough to need some form of help. It is important to reduce the length of waiting time for appointments.

Non-attendance in new patient referrals seems to be largely due to factors that are part of the referral process and of the allocation of appointments. It should

be possible to improve attendance by making referral more personal and by decreasing the waiting time. However, there may be an argument for an "acceptable level" of non-attendance. A further study with larger numbers might bring forth other factors affecting attendance at a psychiatric clinic, leading to a more competent, useful and happier service.

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The nicotinic acid provocation test and unconjugated hyperbilirubinaemia

W Dickey, J J A McAleer, M E Callender

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SUMMARY

It has been suggested that the nicotinic acid provocation test is useful in the diagnosis of Gilbert's syndrome. We compared the response to intravenous nicotinic acid of patients with Gilbert's syndrome and with chronic liver disease. There was no significant difference in the mean rise in unconjugated serum bilirubin between the two groups. A sensitivity of 70% and specificity of 60% were obtained. All of 5 patients with chronic liver disease and a raised fasting unconjugated serum bilirubin had positive tests. We suggest that the nicotinic acid test is positive in unconjugated hyperbilirubinaemia regardless of cause. It is of no value in differentiating Gilbert's syndrome from liver disease.

INTRODUCTION

Gilbert's syndrome is characterised by mild unconjugated hyperbilirubinaemia increased by stress or fasting, in the absence of significant haemolysis or liver disease. The differentiation of this benign condition from chronic liver disease can be difficult without liver biopsy. The administration of nicotinic acid intravenously produces a rise in serum unconjugated bilirubin which is greater and more sustained in patients with Gilbert's syndrome than in normal controls, and it has been suggested that nicotinic acid provocation is a useful diagnostic test.[1] However, evidence that this test differentiates Gilbert's syndrome and liver disease is lacking. We have compared the effects of nicotinic acid provocation on patients with Gilbert's syndrome and with chronic liver disease.

PATIENTS AND METHODS

We studied 15 patients with biopsy-proved chronic liver disease (10 with hepatitis B surface antigen (HBsAg) negative chronic active hepatitis, 3 with alcoholic hepatitis and 2 with cirrhosis), and 20 patients with Gilbert's syndrome which was diagnosed on the following criteria: intermittent or sustained unconjugated hyperbilirubinaemia for more than six months, normal serum liver enzyme activities and no evidence of significant haemolysis (normal haemoglobin concentration,

Royal Victoria Hospital, Grosvenor Road, Belfast BT12 6BA.
W Dickey, BSc, MD, MRCP (UK), Registrar.
J J A McAleer, MB, MRCP (UK), Registrar.
M E Callender, MB, MRCP (UK), Consultant Physician.
Correspondence to Dr Callender.

reticulocyte count, serum lactate dehydrogenase, plasma haemoglobin and haptoglobin, and negative Coombs' test). Serum total and direct (conjugated) bilirubin concentrations were assayed using modified Jendrassik-Grof techniques (diazotised sulphanilic acid-based methods) and unconjugated bilirubin concentrations calculated from the difference (normal total and unconjugated bilirubin concentrations $\leqslant 18$ μmol/l).

Informed consent was obtained from all patients and the nicotinic acid test was performed as described.[1] After an overnight fast, patients received fifty milligrams of nicotinic acid by slow intravenous injection. Blood samples were taken for total and conjugated serum bilirubin assay at 30 minute intervals over three hours. A positive result has been defined as a rise of greater than 17 μmol/l in unconjugated bilirubin during the test.[2]

RESULTS

The figure shows the rise in unconjugated bilirubin three hours after administration of nicotinic acid for each patient. The mean rise in patients with Gilbert's syndrome was 21·55 (± 9·43) μmol/l (range 3–46) compared with 17·3 (± 18·9) μmol/l (range 0–77) in those with liver diease: this difference was not statistically significant.

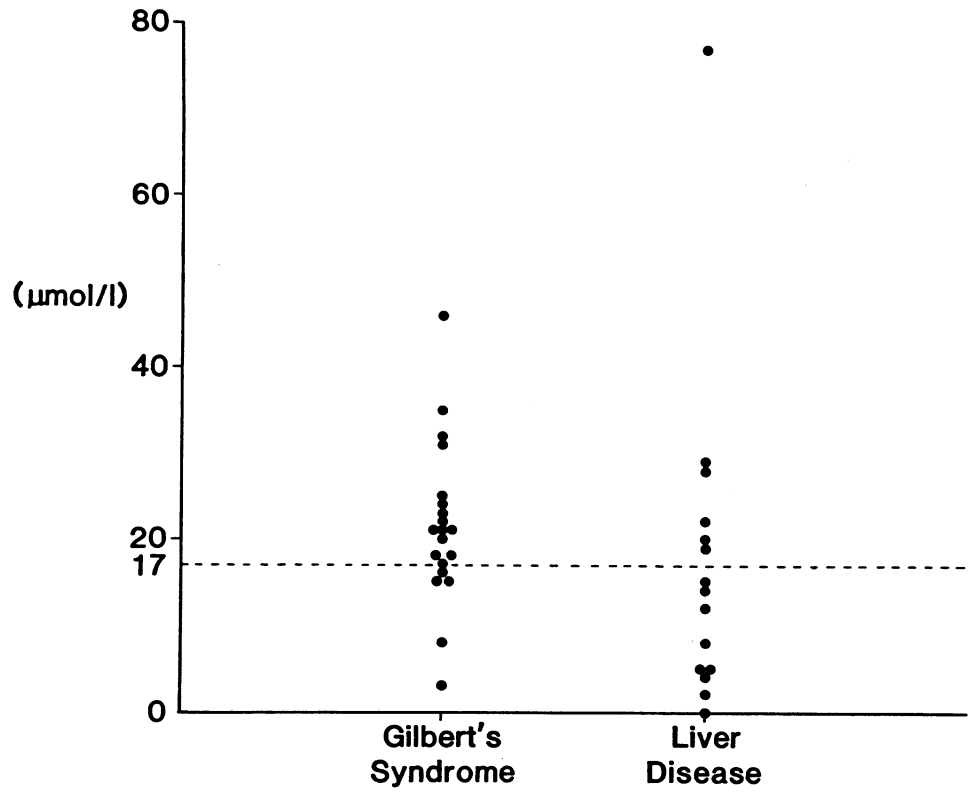

Figure. Rise in unconjugated bilirubin (μmol/l) 3 hours after administration of nicotinic acid. (Positive test-rise greater than 17 μmol/l).

A positive result, (a rise in unconjugated bilirubin of greater than 17 μmol/l), was obtained in 14 of 20 patients with Gilbert's syndrome and in 6 of 15 with chronic liver disease: the sensitivity of the test for Gilbert's disease was thus 70% and the specificity was 60%. Five patients, although previously diagnosed as having Gilbert's syndrome, had a normal fasting unconjugated serum bilirubin ($\leq$ 18 μmol/l) immediately before receiving nicotinic acid. Of these, three had a negative test. All five patients with chronic liver disease and a raised unconjugated fasting bilirubin had a positive test (range 19–77 μmol/l: mean 35).

Of 20 patients in total who had a raised unconjugated fasting bilirubin, irrespective of diagnosis, 18 had a positive test, compared with 3 of the 15 remaining patients: thus, the sensitivity of the nicotinic acid test for unconjugated hyperbilirubinaemia was 90% and specificity was 80%.

DISCUSSION

Mattei[3] first observed that serum unconjugated bilirubin rises after the intravenous injection of nicotinic acid. The mechanism is unclear but alterations in the erythrocyte membrane may occur making red cells more susceptible to splenic haemolysis. The rise in bilirubin is abolished after splenectomy.[4] Fromke and Miller[5] reported that serum unconjugated bilirubin rose characteristically threefold 120 minutes after the injection of nicotinic acid in patients with Gilbert's syndrome compared with a twofold peak after 90 minutes in normal controls. Davidson et al[1] compared the rise in bilirubin in 16 patients with Gilbert's syndrome and six normal controls. Levels in the control patients reached a plateau at 90 minutes: in contrast, peak values for the Gilbert's syndrome patients were higher and occurred later at 180 minutes. The mean increase in bilirubin at 180 minutes was significantly higher in the patients with Gilbert's syndrome than in controls (23·3 ± 8·9 μmol/l v. 6·5 ± 4·8 μmol/l: $p < 0{\cdot}001$). The authors concluded that a single measurement of plasma bilirubin 180 minutes after the administration of nicotinic acid could distinguish patients with Gilbert's syndrome from normal subjects. Yet data for patients with liver disease are scanty. Fromke and Miller[5] described 2 patients with primary biliary cirrhosis and raised fasting total serum bilirubin levels who had response curves typical of Gilbert's syndrome. Ohkubo et al[2] compared the rise in bilirubin following intravenous nicotinic acid in patients with Gilbert's syndrome and with chronic hepatitis. They concluded that a rise in unconjugated bilirubin of more than 17 μmol/l was "highly suggestive" of Gilbert's disease, but the initial fasting bilirubin levels in patients with liver disease were not stated.

In our study, the nicotinic acid test failed to discriminate between patients with Gilbert's syndrome and those with a raised fasting unconjugated hyperbilirubinaemia due to chronic liver disease. All five patients with chronic liver disease and a raised fasting unconjugated bilirubin had a positive test. We suggest that an exaggerated response to nicotinic acid occurs in patients with a raised unconjugated bilirubin regardless of cause. This is supported by the finding that the response in patients with hyperbilirubinaemia due to haemolytic anaemia does not differ significantly from that of Gilbert's syndrome.[2] The nicotinic acid provocation test is thus unreliable for the diagnosis of Gilbert's syndrome. We agree with the suggestion[6] that the diagnosis may be made, without the need for

invasive tests, in patients with unconjugated hyperbilirubinaemia after careful history, examination, blood tests to exclude haemolysis and liver disease and 12–18 month follow-up.

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Should children with minor medical problems be sent to hospital? A study of infant care practices within families

M Fitzgerald, Hannah M McGee

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SUMMARY

The admission of children to hospital for minor medical problems is frequently influenced by family and social circumstances. This study compared the infant care practices of families of children admitted to hospital for gastroenteritis (n = 76) and families caring for children with gastroenteritis at home (n = 76). Mothers of children who were admitted to hospital were more likely to use medical sources of advice on parenting and less likely to use other non-family sources than home care mothers. They also received less support in the education / entertainment of their children from fathers. There were many similarities between the two groups, including the high level of behaviour problems of the children and the relatively low level of involvement of fathers in child care tasks. Both of these factors serve to increase stress on mothers to the point where they may be unable to cope with a sick child at home.

INTRODUCTION

Parenting is a life skill for which there is no training and few resources for advice and guidance.[1] Parenting styles show considerable continuity throughout childhood[2] and indeed the effects of parenting in one generation are clearly carried on to the next generation.[3] This overrides the impact of other influences such as material disadvantage or different family structures.[4] Some factors, such as high levels of stressful life events, have been shown to distract parents from taking care of their children.[5] In the health area, parents certainly influence the development of behaviour patterns in their children, for instance in areas such as nutrition and exercise,[6] which are important in terms of current health and ultimate longevity.[7] In illness, indifferent parenting styles are associated with less well controlled childhood disease.[8]

There is increasing discussion of the asymmetry of modern family arrangements in relation to the family work role.[9] Research suggests that women still shoulder almost all of the housework burden in families, regardless of their own job

Child and Family Centre, Ballyfermot, Dublin 10.
M Fitzgerald, MB, MRCPsych, Consultant Child Psychiatrist.

Department of Psychology, Royal College of Surgeons in Ireland, 123 St Stephen's Green, Dublin 2.
Hannah M McGee, BA(Mod), PhD, Research Fellow/Lecturer.

involvement.[10] While child centred tasks are shared more often than household tasks,[11] households with young children are particularly asymmetrical in their overall division of household tasks.[12]

An Irish study found little difference between groups of single and married mothers on a range of demographic, psychosocial and child development indices, but found that the sub-group of single mothers who lived alone were especially vulnerable to problems.[13]

One area in which non-medical factors such as parenting skills may influence disease incidence and management is that of infantile gastroenteritis. A recent study compared a group of children managed at home and a group managed in hospital for childhood gastroenteritis in the light of clinical concerns about the large number of admissions to hospital of children with this complaint for non-medical reasons. No differences were expected in terms of medical severity of the gastroenteritis. In the larger study, blind ratings by doctors specialising in gastroenteritis clearly showed that there were no such differences between hospital-managed and home care groups. An explanation was sought by examining social and family factors, as home care management of gastroenteritis may be associated with better parenting skills. Identification of differences in parenting between the two groups could provide a focus for the development of preventive strategies with young parents.

METHODS

Sample: The families of a group of 152 children under two years of age from an urban geographical region were interviewed about a recent childhood illness (gastroenteritis). The region was West Dublin; an area of approximately 300 square miles as defined by county boundaries to the west and by city postal districts to the east. A diagnosis of gastroenteritis by the doctor concerned was taken as the medical inclusion criterion. All children who had been admitted to the region's infectious diseases hospital with gastroenteritis in the first quarter of 1987 were identified from hospital records (n = 78). An equal number of families who were known to have had a child with gastroenteritis in the same period but who had not been admitted to hospital were identified by contact with general practitioners and hospital casualty departments. General practitioners were interviewed for another part of the study, and were asked to provide their most recent case of childhood gastroenteritis which was managed at home. Casualty department records in the city's two largest paediatric hospitals were examined for gastroenteritis attendances which were managed at home in the same region and time period. Approaches to families resulted in a 97% response rate.[14]

Procedure: Questions were asked on a number of aspects of parenting, including prior experience and knowledge, sources of advice, parenting skills management and the role division between mother and father. It was agreed that home care for childhood gastroenteritis, as for any other minor childhood illness, was best.

Statistics: The statistical procedures used were chi-square analysis for categorical variables group comparison, one-tailed t-test analysis for interval variables group comparisons and Pearson correlation analysis for interval variable examination of sample characteristics.

RESULTS

On comparison with the census figures for 1981,[15] two-parent families with more than one child were under-represented in the overall sample (home sample: 58%; hospital sample: 58%; census proportion: 70%, $p < 0{\cdot}02$). Two-parent families with only one child were slightly over-represented in the home care but not in the hospital care sample (home care: 32%; hospital care: 25%; census proportion: 23%, $p < 0{\cdot}06$). Single parent families constituted 9% of the cases seen in the home sample and 14% in the hospital sample, in comparison to 3% of all families in the area ($p < 0{\cdot}001$). There were no significant differences in the numbers of children in single parent families in the home and hospital samples.

Prior experience of different facets of parenting are shown in Table I. Levels of experience with young children are significantly higher for the hospital care mothers, the reverse holding for pre-natal class attendance and reading on babycare. Women with more experience of young children are more likely to be younger ($r = -0{\cdot}28$, $p = 0{\cdot}01$), to be less well educated ($r = -0{\cdot}25$, $p = 0{\cdot}03$) and to have husbands of lower occupational status ($r = 0{\cdot}21$, $p = 0{\cdot}05$).

TABLE I

Experiences related to child care / parenting of 152 study mothers

Mother's experience	*Hospital care %*	*Home care %*	*p*
Caring for young children	88	75	$< 0{\cdot}05$
Reading about child care	50	80	$< 0{\cdot}05$
Pre-natal class attendance	36	63	$< 0{\cdot}01$

There was no difference between hospital care and home care mothers in knowledge of aspects of child care when tested by a series of statements and asked to indicate "true" or "false" — such as "a baby needs to be more warmly dressed than an adult", "if a baby is fat you know it is healthy", or "some babies spit up all their feeds".

Families were the main source of parenting advice for both groups of mothers. Medical sources were more evident for hospital care mothers (12% versus 3%, $p < 0{\cdot}05$), and non-family contact less evident (14% versus 55%, $p < 0{\cdot}001$). Nine percent of hospital and six percent of home care mothers had no source of parenting advice.

Involvement in child care tasks by mothers and fathers is shown in Table II. Most of the child care was provided by mothers, although there was some paternal involvement in all the tasks mentioned. Fathers were most involved in the play activity of their children. Differences in the involvement in child care tasks existed for only two of the eleven dimensions for mothers. Home care fathers took their children outdoors significantly more often. Both mothers and fathers of children who were cared for at home were more likely to read to their children, ($p = 0{\cdot}08$) for mothers and $p = 0{\cdot}12$ for fathers). Combining the number of times children were taken outdoors, read to and played with into an index of "child socialisation",

home care children were significantly more socialised than hospital care children (15·3 versus 12·7 episodes of such socialisation in a week, p = 0·004). The overall involvement in child care tasks of mothers was similar across the groups, (average 74% for mothers and 20% for fathers).

TABLE II

Involvement in child care tasks by mothers and fathers

	Mothers		*Fathers*	
Tasks	*Hospital care*	*Home care*	*Hospital care*	*Home care*
No. of days involved weekly:				
getting child up in morning	5·7	5·9	1·1	1·0
dressing child	5·4	6·1*	1·2	0·9
preparing child's food	5·6	5·8	0·9	1·0
feeding child	4·8	5·5*	1·4	1·4
changing nappies	5·5	5·4	0·9	1·3
putting child to bed	4·9	4·8	1·4	1·6
No. of times weekly:				
bathing child	4·8	4·2	0·4	0·6
playing games	3·0	3·4	2·1	2·6
taking child outdoors	3·0	3·2	1·2	1·7
reading to child	1·3	1·7	0·8	1·2
babysitting without mother	N/A	N/A	1·1	0·8
taking up crying child at night	2·6	2·0	0·7	0·6

N = 152; one-tailed t-test analysis.

* $p < ·05$ (comparisons between mothers and between fathers).

DISCUSSION

In dealing with the problem of infantile gastroenteritis, parental inexperience (leading to anxiety and caution, yet an overall willingness and perceived ability to manage at home) may explain the greater preponderance of families with only one child whose children were cared for at home. It is likely that anything that undermines the family system will cause stress and reduce coping ability. A reduced level of paternal involvement with children may increase the burden on the mother and make her less capable of coping with an ill child. There is no need for fathers to become more involved in the management and care of their children.

Very few of the children in this study were re-admitted to hospital on a second occasion. It would appear that families learn, in hospital, about the management of gastroenteritis. Mothers expressed more confidence in the future management of a gastroenteritis episode following their child's stay in hospital. This suggests that a preventive educational strategy by general practitioners, public health nurses or health visitors might reduce hospital admissions. The impact of investment in families at preventative level has been outlined by Reif who used family

education as the investment domain and childhood hospitalisation as a measure of the impact of preventive spending.[16] For families in Jerusalem he showed that a third year at secondary school for at least one parent was associated with an average decline of 1·3 hospital days per infant per year.

The present study confirms that considerable stress is involved in rearing children, and that significant numbers of children have behaviour problems. This may explain the high rates of psychiatric illness and disturbance in mothers, as demonstrated by Brown and Harris,[17] a situation probably aggravated by the asymmetry of parental relationships with the children. Health education in the management of a particular illness such as gastroenteritis might reduce the number of children admitted to hospital which would be beneficial both in financial terms and in terms of the psychological well-being of the child. In the broader situation, more symmetrical sharing of child care by both parents might reduce stress on the mother and increase her coping ability in the management of a common childhood illness such as gastroenteritis.

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Trends in the methods used for suicide in Northern Ireland

P S Curran, D Lester

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SUMMARY

As domestic gas was made less toxic in Northern Ireland during the period 1960 – 1988, it was used less often for suicide. During the same period, as car ownership increased, the use of car exhaust for suicide increased in popularity without there being a corresponding decrease in the use of other methods. Part of the temporal variation in suicide rates in Northern Ireland may be accounted for by the relative availability of lethal methods for suicide.

INTRODUCTION

Curran, Finlay, and McGarry[1] documented that the suicide rate in Northern Ireland rose gradually in the 1960s, dropped in the early 1970s, and since then rose steadily up to 1986. The rise in recent years was most marked for males aged 25 to 34 years of age.

They also examined the trends in the methods of suicide in Northern Ireland over the same time. The use of domestic gas decreased from 1960 to 1986, until by 1986 it was the least favoured method. The use of poisons and drugs increased during the 1960s, dropped in the early 1970s and has risen since then, becoming by 1986 the second most favoured method. Hanging, by 1986 the most favoured method for suicide, showed a similar trend. Suicide by firearms remained steady until the mid 1970s, after which the rate has risen steadily.

Various explanations have been proposed for the changing suicide rates over time in a nation, including changing economic[2] or social[3] conditions, and for Northern Ireland civil disorders. Clarke and Lester[4] have speculated on the role that the availability of lethal methods might play in the temporal variation of suicide rates by particular methods, even to the point of affecting the overall suicide rate. For example, it is now generally accepted that the decline in the English suicide rate in the 1960s and early 1970s was due to the detoxification of domestic gas as the gas industry switched from coal gas (which contains carbon monoxide) to natural gas (which does not). Not only did the suicide rate using domestic gas decline to virtually zero, but the overall suicide rate declined by about one-third.

Mater Infirmorum Hospital, Belfast.
P S Curran, MB, MRCPsych, Consultant Psychiatrist.
Richard Stockton State College, New Jersey, USA.
D Lester, PhD, Professor of Psychology.

Clarke and Lester documented the effects of the detoxification of domestic gas, the detoxification of car exhaust emissions (by the introduction of emission controls), the ownership of firearms and the availability of cars on the suicide rates of Australia, England and Wales, the Netherlands, Scotland, and the USA, both over time and over regions.[4] They concluded that the availability of a method for suicide certainly affects the use of that method and, on occasions, seems to have an impact on the overall suicide rate, particularly if the method studied is a popular one for suicide (as was domestic gas in England and the use of firearms in the USA).

From 1964 to 1988 there were 2168 suicides in Northern Ireland, of which 702 were due to solid and liquid poisons, 395 to hanging, 365 to drowning, 256 to firearms or explosives, 209 to domestic gas, 111 to other gas (mainly car exhaust), 38 to cutting or piercing instruments, 31 to jumping and 61 to other methods. It is possible to obtain rough estimates of the availability of three of these methods for suicide: domestic gas, car exhaust, and firearms. The present study explores the relationship between these measures of availability and the use of those methods for suicide.

For domestic gas, the major detoxification was between 1964 and 1968 (personal communication from the Department of Environmental Health). From 1960–1964 the carbon monoxide content ranged from 18 percent to 22 percent. (It is difficult to be precise here, since each region had its own gas company). Between 1964 and 1968, the range for carbon monoxide content was 12 percent to 20 percent, and from 1968 the range was only four to seven percent. Thus, domestic gas was certainly less toxic after 1968. For car exhaust emissions, the ownership of cars in Northern Ireland increased steadily from 1964 to 1968, from 0·13 to 0·28 cars per capita. For firearm ownership, no direct measures are available. Cook has suggested two indirect indices of firearm ownership, the percentage of homicides committed with firearms and the accidental death rates from firearms.[5] He argued that if more guns were available in a community, both of these indices would be higher.

METHODS

Data on the deaths each year in Northern Ireland were obtained from the Department of Health and Social Services (General Register Office). Data on suicides due to car exhaust fumes are not specifically listed, but rather for "gases not in domestic use", of which the vast majority are from car exhausts. Data on car ownership were obtained from the Department of Finance and Personnel, and information on domestic gas supplies from the Department of Environmental Health.

RESULTS

Domestic gas

From 1964 to 1968, the average number of suicides using domestic gas each year in Northern Ireland was 21·0; from 1969 to 1973 the average was 5·8 per year (Table I). The suicide rate from domestic gas dropped from 2·06 per 100,000 per year in 1964 (the peak year during the period) to 0·39 in 1973 and 0·19 in 1987. The last supply of coal gas in Northern Ireland stopped in 1988,

and the suicide rate using domestic gas dropped to zero that year. It is clear that the availability of toxic domestic gas did have an impact on the suicide rate using domestic gas. A critical question is whether people switched to alternative methods for suicide once domestic gas became less toxic and accounted for fewer suicides.

For the ten year period from 1964 to 1973 the slope of the linear regression line for the domestic gas suicide rate was negative (−0·19), while the slope of the linear regression line for suicide by all other methods was also negative (−0·05). While the suicide rate by domestic gas decreased during this period, so did the suicide rate by all other methods. Thus there is no evidence up to 1973 that as people used domestic gas less often for suicide they switched to other methods.

TABLE I

Suicide rates by domestic gas and other methods

	Suicide rate (per 100,000)	
	Domestic gas	*Other methods*
1964	2·06	3·36
1965	1·16	3·61
1966	1·55	3·97
1967	1·48	5·10
1968	0·87	5·73
1969	0·56	5·49
1970	0·26	3·67
1971	0·26	3·18
1972	0·39	2·66
1973	0·39	4·18

TABLE II

Car ownership and suicides by car exhaust fumes

	Cars/capita	*Suicide rate (per 100,000)*	
		Car exhaust	*Other methods*
1964	0·130	0·137	5·28
1965	0·146	0·000	4·77
1966	0·157	0·269	5·25
1967	0·169	0·134	6·44
1968	0·174	0·000	6·59
1969	0·183	0·132	5·95
1970	0·188	0·197	3·74
1971	0·201	0·065	3·38
1972	0·198	0·000	3·05
1973	—	0·000	4·58
1974	0·203	0·262	3·80
1975	0·206	0·197	3·48
1976	0·214	0·197	4·27
1977	0·222	0·263	4·33
1978	0·228	0·328	4·27
1979	0·234	0·589	4·38
1980	0·238	0·391	4·89
1981	0·237	0·390	5·46
1982	0·262	0·650	5·40
1983	0·274	0·454	8·75
1984	0·288	0·129	6·90
1985	0·266	0·641	6·87
1986	0·270	0·574	8·68
1987	0·276	0·381	5·02
1988	0·281	0·824	8·87

— missing data.

Car exhaust

Car ownership increased steadily from 1964 to 1988 (Table II). The suicide rate using car exhaust also increased from 0·14 to 0·82 per 100,000 per year from 1964 to 1988. The slope of the linear regression line for the 25 year period was 0·024 (Pearson correlation coefficient 0·77). Thus the suicide rate using car exhaust increased significantly over the 25 year period. The suicide rate by all methods other than car exhaust also rose over the period, with a linear regression slope coefficient of 0·10 (Pearson correlation coefficient 0·46). Again there was no evidence of switching; as car exhaust became more popular as a method for suicide other methods did not become less popular.

Firearms

The suicide rate using firearms and explosives rose during the period from 0·27 per 100,000 per year to a peak of 2·15 in 1988 (Table III). In contrast the percentage of homicides using firearms and explosives peaked in 1974 (96·2% of all homicides), as did the accidental death rate from firearms (0·79 per 100,000 per year). The correlation between the

percentage of homicides using firearms/explosives and the suicide rate using firearms/explosives was not significantly different from zero ($r = 0{\cdot}16$, $df = 19$), and neither was that between the accidental death rate from firearms and the suicide rate using firearms/explosives ($r = -0{\cdot}30$, $df = 23$).

TABLE III

Deaths due to firearms

	Suicide rate (per 100,000) by firearms	*Accidental death rate by firearms*	*Homicides by firearms %*
1964	0·274	0·48	—
1965	0·408	0·14	—
1966	0·404	0·20	—
1967	0·402	0·20	—
1968	0·333	0·20	28·6
1969	0·264	0·07	30·0
1970	0·394	0·20	57·9
1971	0·325	0·39	53·8
1972	0·325	0·39	81·8
1973	0·588	0·72	85·2
1974	0·262	0·79	96·2
1975	0·394	0·53	92·6
1976	0·722	0·66	95·5
1977	0·328	0·33	81·5
1978	0·591	0·59	81·0
1979	0·523	0·33	70·1
1980	0·652	0·33	76·9
1981	0·715	0·07	79·5
1982	0·910	0·20	82·3
1983	0·972	0·45	88·4
1984	0·967	0·45	76·8
1985	1·220	0·06	60·3
1986	1·532	0·13	70·4
1987	0·952	0·25	74·4
1988	2·154	0·13	76·9

— missing data.

DISCUSSION

This study indicates that the suicide rate in Northern Ireland was affected by the availability of car exhaust and toxic domestic gas. When domestic gas was detoxified the use of that method for suicide declined without there being an increase in the use of other methods for suicide. Similarly, as motor cars became more available, the use of car exhaust fumes for suicide became more common without there being a reduction in the popularity of other methods for suicide. Thus there is no evidence that people switched methods for suicide as the availability of other methods changed. It may be that the increasing use of car exhaust fumes for suicides during the period studied was related to the decreasing toxicity of domestic gas and that some of those who might have used domestic gas for suicide may have switched to car exhaust fumes instead. It should also be noted that suicide by means of domestic gas was not as common a method for suicide during this period as it was in England and Wales. In Northern Ireland, domestic gas suicides accounted for only 9·6 per cent of suicides from 1964 to 1988, and car exhaust fumes accounted for only 5·1 per cent of the suicides.

The use of firearms for suicide did not fit this pattern. For this analysis, indirect measures of firearm availability had to be used, such as the percentage of homicides using firearms/explosives and the accidental death rate from firearms. Had direct measures of firearm availability been available the results might have been different. The availability of firearms to security forces and of firearms and explosives to those opposing the security forces make the indirect measures of firearms availability less valid for Northern Ireland.

These results parallel those found in the USA, where increasing car availability was associated with an increase in the use of car exhaust for suicide, and the detoxification of domestic gas was associated with a reduction in its use for

suicide.[4] The failure to find similar associations for firearms also parallels the USA results,[6] although similar indirect measures also had to be used in that country.

Some methods for suicide remain steadily available, such as hanging and drowning. The present results suggest that some of the variability of suicide rates over time can be accounted for by changes in the availability of methods.

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Human immunodeficiency virus infection in Northern Ireland 1980 – 1989

R D Maw, J H Connolly, E E Mayne, W McClelland, W W Dinsmore, T Horner, J S Boyd, H M Colhoun, L Doherty, D M Simpson

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SUMMARY

To 31st December 1989, 71 persons are known to have attended medical practitioners in Northern Ireland with a diagnosis of Human Immunodeficiency Virus (HIV) infection. Twenty-one of these persons have had the diagnosis of Acquired Immune Deficiency Syndrome (AIDS) and 11 have died. The distribution of reports in the "at risk" categories of homosexual / bisexual males, injecting drug users, heterosexual males and females was significantly different ($p < 0{\cdot}001$) from those reported in the United Kingdom as a whole. Of tests for HIV infection carried out in patients attending the genitourinary medicine department of the Royal Victoria Hospital between 1987–1989, 0·16% have been positive. The prognostic value of the T4 lymphocyte count at presentation for the subsequent development of AIDS was significant ($p = 0{\cdot}0011$). The commonest AIDS indicator disease diagnosed was Pneumocystis carinii *pneumonia which was seen in seven of the 21 patients (33%).*

INTRODUCTION

The Acquired Immune Deficiency Syndrome (AIDS) was first described in 1981[1-3] and was soon recognised to be behaving as an infectious disease which particularly affected homosexual or bisexual men, intravenous drug misusers, people from central Africa and haemophiliacs. These categories of persons

Department of Genitourinary Medicine, Royal Victoria Hospital, Belfast BT12 6BA.
R D Maw, MB, MRCP, Consultant Physician.
W W Dinsmore, MD, MRCP, Consultant Physician.
T Horner, MD, MRCGP, Consultant Physician.
J S Boyd, MB, MRCP, MRCGP, Registrar.
H M Colhoun, MB, BCh, Senior House Officer.
L Doherty, MB, BCh, Senior House Officer.

Regional Virus Laboratory, Royal Victoria Hospital, Belfast BT12 6BA.
J H Connolly, MD, FRCP, FRCPath, Consultant Virologist.
D M Simpson, FILMS, Medical Laboratory Scientific Officer.

Northern Ireland Haemophilia Service, Royal Victoria Hospital, Belfast BT12 6BA.
E E Mayne, MD, FRCP, FRCPath, Consultant Haematologist.

Northern Ireland Blood Transfusion Service, 89 Durham Street, Belfast.
W McClelland, MB, MRCPath, Medical Director.

Correspondence to Dr Maw.

became known as "high-risk groups" for development of the disease. The cause of the syndrome is now commonly accepted to be human immunodeficiency virus (HIV), first described in 1983.[4] The pattern of the HIV epidemic has differed from country to country[5] and even from city to city[6,7] within a particular country. These differing emerging patterns seem to depend on local epidemiological factors specific to each area. We describe the emergence of HIV infection in Northern Ireland, and we examine the pattern of disease that develops and the management of patients.

METHODS

The data was collected from the records of the Genitourinary Medicine Departments of hospitals in Northern Ireland. Other sources were the Regional Virus Laboratory, the Northern Ireland Haemophilia Service and the Northern Ireland Blood Transfusion Service.

The Regional Virus Laboratory began anti-HIV testing in May 1985 and the Northern Ireland Blood Transfusion Service in October 1985. An anti-globulin ELISA test (Vironostika anti-HTLV-III, Organon, Teknika) is used by the Regional Virus Laboratory, and if positive, it is repeated together with two different tests — a competitive ELISA test (Vironostika anti-HIV Uniform Organon Teknika) and a gelatin particle agglutination test (Serodia-HIV Fujirebio Inc.). If these tests are all positive a further serum sample is obtained from the patient and all three tests are repeated. If the three tests are again positive only then is the patient reported as confirmed anti-HIV positive. Initially confirmatory tests were done by Dr R S Fedder of the Section of Virology, Microbiology Department, the Middlesex Hospital and University College Medical School, London, but they are now done in the Regional Virus Laboratory. Anti-HIV IgM tests were carried out on sera from two babies born to anti-HIV positive mothers by Dr P P Mortimer, Virus Reference Laboratory, Central Public Health Laboratory, Colindale, London.

Retrospective testing of haemophiliacs was done on available sera which had been stored at $-20°C$ in the Regional Virus Laboratory and fresh sera were obtained from the Department of Haematology, Royal Victoria Hospital.

HIV p24 antigen ELISA tests (Organon Teknika) were performed on sera of those patients entering the Medical Research Council study on the use of Zidovudine in asymptomatic persons with HIV positive tests, on two babies born to anti-HIV positive mothers and on other patients when clinically indicated. All tests done were for HIV-1 antigen or antibody.

Statistical methods used were the Chi-squared test and Fisher's exact probability test.

HIV cases seen to date

The figures quoted in this article refer to those persons known to the authors who have been under medical care in Northern Ireland. Some of these persons have not been resident in Northern Ireland but visit the province on occasions. Others are persons who have been diagnosed elsewhere but moved to Northern Ireland for their care. These figures are not the same as the official figures from Northern Ireland[8] which purport to be reports of persons with a first-ever diagnosis of HIV infection.

The first known case of HIV disease seen in Northern Ireland was diagnosed retrospectively. The patient, a 50-year-old African male, with hepatitis B infection was admitted to the Royal Victoria Hospital in 1982 with cerebral symptoms and a pyrexia of unknown origin. He developed toxic epidermal necrolysis and died within a few days. A stored sample of blood was subsequently tested when the HIV antibody test became available, and this was found to be positive. It is thought that this man died of an AIDS-related illness. Since then there have been 71 known cases of HIV infection seen in Northern Ireland to 31st December 1989.

Table I shows the epidemiological risk categories (as classified by the Communicable Disease Surveillance Centre) into which these persons belonged. Thirty-four (48·5%) were homosexual/bisexual males and eight (11·4%) were females with only heterosexual intercourse as their risk factor. Heterosexual males accounted for six cases (8·6%). Four injecting drug users were seen (5·7%). The percentages for these groups of known epidemiology reported in the U.K.[8] were: homosexual/bisexual males — 58·8%; females with heterosexual intercourse — 5·0%; male heterosexual — 3·9%; injecting drug users — 18·6%. The different distribution of our cases in these four categories is statistically significant ($p < 0·001$). One person has been classified as unknown category. Fig 1 illustrates the numbers of new cases seen each year by sex and risk factors.

The 16 haemophiliacs (22·5%) identified as infected with the virus in 1985 when HIV antibody testing became available have been cared for by the Northern Ireland Haemophilia Service. Of the 55 remaining persons 49 (69%) have been cared for by the genitourinary medicine services. The remaining six (8·5%) have been cared for by other agencies.

TABLE I

Cumulative totals of HIV-1 antibody positive persons seen in Northern Ireland by exposure category to 31st December 1989

Exposure category	*Male*	*Female*	*Total*
Homosexual/bisexual male	34	—	34
Injecting drug user	2	2	4
Homosexual/bisexual male and injecting drug user	—	—	—
Haemophiliac	16	—	16
Blood/components recipient	1	—	1
Heterosexual contact:			
Partner(s) with above risk factor(s)	—	1	1
Others*			
Possibly infected abroad	4	2	6
No evidence of exposure abroad	2	5	7
Undetermined	—	—	—
Child of at-risk/infected parent	—	—	—
Multiple risks	—	1	1
Other/undetermined	1	—	1
Totals	60	11	71

*Partner(s) not known to have above risk factor(s).

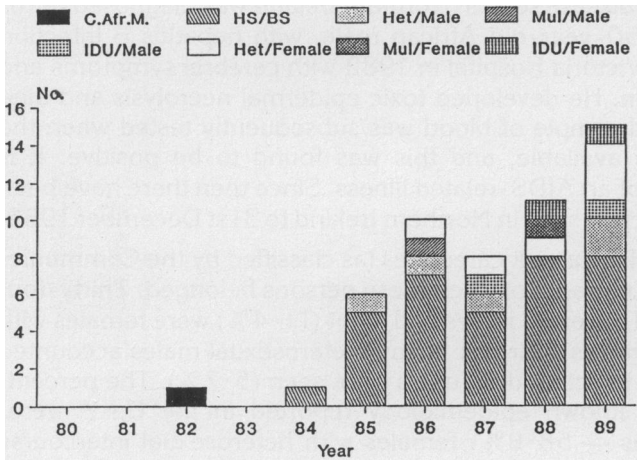

Fig 1. HIV positive persons identified each year 1980 – 1989 by sex and risk category (excludes 16 male haemophiliacs diagnosed 1985).
C.Afr.M = central African male;
IDU = Injecting drug user;
HS/BS = Homosexual/ bisexual male;
Het. = Heterosexual;
Mul. = Multiple risk factors.

To 31st December 1989, 21 persons with the Acquired Immune Deficiency Syndrome have been looked after in Northern Ireland; of these 11 have died. Table II shows the risk categories to which these patients belonged. Fig 2 illustrates the new cases of AIDS diagnosed each year. The first two cases in females were seen in 1989.

TABLE II

Cumulative totals of AIDS cases (deaths) seen in Northern Ireland by exposure category to 31st December 1989

Exposure category	*Male*	*Female*	*Total*
Homosexual/bisexual male	15 (11)	—	15 (11)
Injecting drug user	—	—	—
Homosexual/bisexual male and injecting drug user	—	—	—
Haemophiliac	—	—	—
Blood components recipient: abroad	1	—	1
UK			
Heterosexual contact:			
Partner(s) with above risk factor(s)	—	—	—
Others*			
Known exposure abroad	3	1	4
No evidence of exposure abroad	—	1	1
Child of at-risk/infected parent	—	—	—
Multiple risks	—	—	—
Other/undetermined	—	—	—
Totals	19 (11)	2	21 (11)

*Partner(s) not known to have above risk factor(s).
Figures in brackets are positive results.

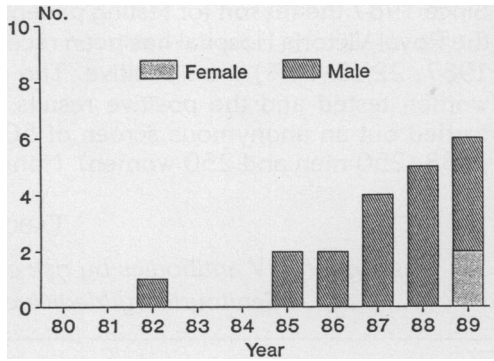

Fig 2. Number of new cases of the Acquired Immune Deficiency Syndrome seen per year 1980–1989 in Northern Ireland.

Testing

The Northern Ireland Blood Transfusion Service has screened approximately 65,000 donors per year, about 15% of whom are new donors. Of these, four persons have tested positive — two men, one of whom was known to be homosexual and two women. Subsequent contact tracing showed that one male partner of this homosexual man and the bisexual husband of one of the women also had a positive test.

The Regional Virus Laboratory has tested 9,093 other blood samples for HIV antibodies. One hundred and twenty-three patients with coagulation defects who had received treatment with blood products were tested and 16 were positive (13·8%). If only severely affected patients (less than 0·02 units/decilitre factor VIII) are included this rises to 25%. Stored sera were available on 11 of the 16 positive patients and when tested showed that seroconversion occurred between 1983 and 1985. The source of seroconversion in one patient in 1985 was traced to a batch of heat treated factor VIII which was found retrospectively to be contaminated with HIV (Fig 3).

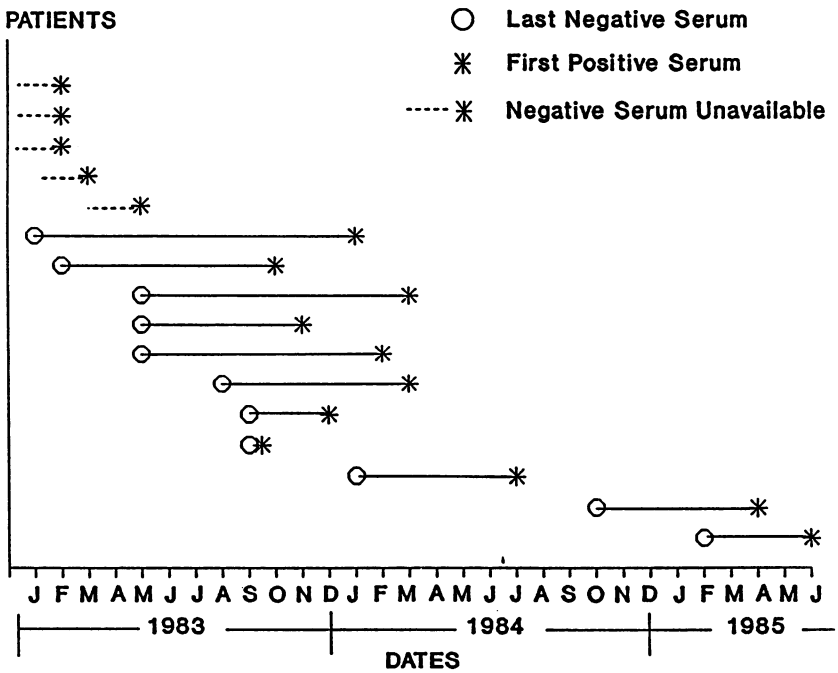

Fig 3. Time of anti-HIV–1 seroconversion in 16 haemophiliac patients.

Since 1987 the reason for testing patients at the Genitourinary Medicine Clinic in the Royal Victoria Hospital has been recorded. Of the 1433 tests carried out since 1987, 22 (0·16%) were positive. The epidemiological categories for men and women tested and the positive results are shown in Table III. In addition we carried out an anonymous screen of 500 consecutive attenders at this clinic in 1988 (250 men and 250 women). None of these tests was positive.[10]

TABLE III

Testing for HIV antibodies by risk categories in Royal Victoria Hospital Genitourinary Medicine Clinic — 1987–1989

Male	*1987*	*1988*	*1989*	*Total*
Homosexual	85 (2)	60 (4)	41 (2)	186 (8)
Bisexual	24	9 (1)	11 (1)	44 (2)
Heterosexual with risk factor	41 (1)	23	25 (1)	89 (2)
Injecting drug users	6 (1)	5	4 (1)	15 (2)
Anxiety	244	203	152 (1)	599 (1)
Needlestick injury	1	2	0	3 (0)
			Total:	936 (15)

Female	*1987*	*1988*	*1989*	*Total*
Bisexual contact	7	4	2	13 (0)
Heterosexual with risk factors	17 (1)	11 (1)	14 (1)	42 (3)
Injecting drug user	0	0	2 (1)	2 (1)
Prostitute/IDU	0	1 (1)	0	1 (1)
Anxiety	159	126	145 (2)	430 (2)
Children	2	1	0	3 (0)
Unknown	4	0	0	4 (0)
Needlestick (unknown source)	0	2	0	2
			Total:	497 (7)

Figures in brackets are positive results.

Of the remaining 7,160 tests from various sources in hospital and general practice, three male patients were found to be positive; one male with heterosexual contact in central Africa, one heterosexual male with a history of blood transfusion in the USA prior to HIV screening of blood, and one having had heterosexual contact in Amsterdam. This last patient had positive serology for syphilis and hepatitis B which are both much commoner infections in homosexual men — as we have not seen this man at the clinic there may be doubt about this epidemiological information. It should be noted that the positive tests do not correlate with the positive diagnoses shown in Fig 1, as six of these persons had had positive tests outside Northern Ireland which were not repeated.

Five persons have suffered needlestick injuries from HIV positive patients — three doctors in the genitourinary medicine service and two nurses in the haemophilia services. None of these has seroconverted during follow-up of between three to 12 months. Two infants have been born to mothers with HIV infection; neither of these has been shown to have become infected on follow-up.

HIV disease

Manifestations of HIV disease are classified according to revised guidelines laid down by the Communicable Disease Centre (CDC) in Atlanta, USA[11] (Table IV). Category 1 was only recognised in 1985[12] and was at first thought to be an unusual event, although it has now been recognised in over 50% of cases in some series.[13] Common manifestations are fever, sore throat, lymphadenopathy, macular rash (especially involving the trunk), arthralgia, myalgia and headaches.[13, 14] This illness usually occurs within a few weeks of infection and predates the seroconversion of the HIV antibody test. It has been suggested that the more severe and prolonged this acute illness the worse is the prognosis, with a more rapid decline in T helper cells and onset of late HIV disease.[13] We have not observed this illness as yet in any of our patients, although retrospectively several reported prior illnesses which would have fitted. One patient had been referred to a medical outpatient department with this illness, but not surprisingly at that time the diagnosis was not made; this is an illness which medical practitioners need to be aware of today.

TABLE IV

CDC classification of human immunodeficiency virus disease manifestation

Group I	Acute infection
Group II	Asymptomatic infection
Group III	Persistent generalised lymphadenopathy
Group IV	Other disease
Subgroup A	Constitutional disease
Subgroup B	Neurologic disease
Subgroup C	Secondary infectious diseases
Category C – 1	Specified secondary infectious diseases listed in the CDC surveillance definition for AIDS
Category C – 2	Other specified secondary infectious diseases
Subgroup D	Secondary cancers
Subgroup E	Other conditions

The majority of patients probably have little or no early symptoms, and those who do invariably recover and become asymptomatic (Group II). Persistent generalised lymphadenopathy (Group III) is defined as the persistence for over three months of two or more extra-inguinal lymph nodes greater than one centimetre in size in persons at risk of HIV infection and having no other cause for lymphadenopathy. This was felt initially to have prognostic significance but recent work suggests this is not the case.[15] Onset of late HIV disease (Group IV)

is often marked by constitutional symptoms of malaise, indolent fever, profuse night sweats, loss of appetite, persistent diarrhoea and mucocutaneous manifestations which include ichthyosis, seborrhoeic dermatitis and deterioration or re-emergence of disorders such as fungal infections (often atypical), acne, psoriasis and eczema. These conditions are by no means specific. More suspicious disorders are recurrent and persistent herpetic infections especially perianal disease in homosexual/bisexual males. Herpes zoster which is more severe than usual, often multidermal or even bilateral and which responds poorly to treatment, facial molluscum contagiosum in adults, oral candidiasis and hairy leukoplakia[16] (a condition said to be specific to HIV infected persons appearing as white plaque-like lesions on the lateral borders of the tongue) are all suspicious. We have seen each of these conditions in our patients except for psoriasis. Some patients had consulted general practitioners, hospital doctors and dentists with many of these problems, sometimes for longer than two years before being diagnosed as HIV positive, so it is necessary today for all medical disciplines to have a high level of awareness of the possible significance of such disorders.

AIDS indicator diseases which led to a classification of AIDS[17] for the 21 cases we have managed are shown in Table V along with diseases diagnosed and treated after the indicator disease. *Pneumocystis carinii* has been the commonest diagnosis accounting for 33% of the indicator diseases, which is not significantly different from the overall figure of 50% reported from the rest of the UK.[8] The longest surviving AIDS patient we have seen is a man with Kaposi's sarcoma, first diagnosed in California in 1985. This man is alive and well at the time of writing this article. The median survival of the 11 patients who have died has been 11 months from the time of initial diagnosis of AIDS, which compares with 9–10 months up to 1987, rising to 18 months in 1987 for patients in England and Wales.[18]

TABLE V

Indicator disease for AIDS diagnosis in 21 patients

	Initial diagnosis	*Subsequent diagnosis*
Pneumocystis carinii pneumonia	7	3
Kaposi's sarcoma	2	—
Oesophageal candida	3	—
Cytomegalovirus infection	2	2
Persistent herpes simplex infection	2	2
Cryptosporidiosis	1	—
HIV encephalopathy	1	—
Cerebral lymphoma	1	3
Intracerebral toxoplasmosis	—	2
Myelitis	—	2
Severe peripheral neuropathy	—	1
Mycobacterium avum intracellular hepatitis	—	1
Unknown	2	—

Unfortunately, no post-mortems have been available in Northern Ireland because of the inadequacy of mortuary facilities. This has precluded us from making additional subsequent diagnoses which undoubtedly have been missed, or confirming some of our presumptive diagnoses such as intracerebral toxoplasma and lymphomas.

Of the 16 haemophiliac patients infected, three have died, one by suicide, one from liver failure unrelated to HIV infection and one in whom HIV infection was contributory. None have had evidence of opportunist infections other than oral candidiasis affecting four and pityriasis versicolor affecting one. Two patients have required treatment for HIV-associated thrombocytopenia, three patients have required treatment with antiviral agents, and the remaining 10 are asymptomatic patients in category CDC II.

Prognosis

Predicting the prognosis for people with HIV disease using laboratory markers has been the subject of intensive research since the disease was first described. A recent study by Fahey et al[19] looked at eight parameters, and concluded that the most useful laboratory markers were the total T4 lymphocyte count, serum beta-2-microglobulin and serum neopterin. Of these three laboratory markers only serial T4 lymphocyte counts have been carried out routinely on HIV positive patients by the genitourinary medical services. Some authors have noted that a T cell count level less than $200 \times 10^6/l$ at the time of presentation is highly predictive of development of an AIDS indicator disease.[15,20] In 30 patients followed up in the genitourinary medicine clinic this parameter gave a good indication of the likely development of AIDS within a 24 month follow-up ($p = 0{\cdot}0011$ Fisher's exact probability test). Nineteen were not evaluated as they either presented to us with AIDS (8), have been lost to follow-up (5), or were temporary visitors to Northern Ireland and were not assessed (6). (Table VI). Use of such markers is of value today along with the clinical state of the patient, as they allow the clinician to make logical decisions on the introduction of antiviral and prophylactic therapy.

TABLE VI

Development of AIDS diagnosis (in brackets) in 30 patients related to T4 cell count at HIV diagnosis (p value calculated using Fisher's exact probability test)

	T4 cell count		
	$> 200 \times 10^6/L$	*$< 200 \times 10^6/L$*	
Follow-up			
0 – 12 months	4 (0)	4 (2)	NS
13 – 24 months	6 (0)	1 (1)	NS
24 + months	11 (2)	4 (4)	$p = 0{\cdot}00011$

Antiviral therapy and prophylaxis

The only anti-HIV drug licenced in the United Kingdom is azidothymidine (AZT). It acts as an inhibitor of reverse transcription which is a vital step in the life cycle of retroviruses and as a chain terminator in proviral DNA synthesis.[21] It has been

shown that azidothymidine inhibits the replication of virus which can lead to clinical improvement, and objective improvement in laboratory markers.[22-24] Unfortunately, the side-effects of this drug may require dose reduction or discontinuation. The most serious side-effect commonly seen is bone marrow suppression with a reduction in both red and white cell counts. Serious side-effects are more common in persons in more advanced stages of the disease. This would be in keeping with our experience of this drug, as nine out of 10 patients treated for aids have had to have dose reduction or complete withdrawal. On the other hand, there seems to be evidence that HIV positive persons who are asymptomatic and have good laboratory parameters are more tolerant of this drug.[25] The Medical Research Council in conjunction with the French research authority INSERM are presently conducting a multi-centre, double-blind study (Concorde Trial), comparing azidothymidine with placebo in asymptomatic persons with HIV infection. The Royal Victoria Hospital Genitourinary Medicine Clinic is a centre in this study and nine patients have been entered for a mean of 44 weeks (range 3 to 59). So far none have had to have dosage reduction because of haematological problems. No information is yet available on progression of disease, but a similar study in America has indicated efficacy in this respect.

Management

Patients other than haemophiliacs with HIV infection have mostly been managed as outpatients by the Genitourinary Medicine Service at the Royal Victoria Hospital, although some attend genitourinary clinics held in Altnagelvin and Coleraine hospitals. These patients have open access to the clinics and the counselling and social services provided at these centres. A designated HIV clinic is in operation at the Royal Victoria Hospital. Inpatient management has mostly been handled by the genitourinary medicine physicians, with close co-operation with relevant specialists, mostly gastroenterology, immunology, neurology and respiratory medicine. Some initial misgivings were voiced by nursing, paramedical and ancillary staff in the care of patients and handling of specimens, but with explanation of the epidemiology of the infection, familiarity with day to day management, and the advent of the EHSSB staff education programme,[26] these have largely been allayed, and our experience compares favourably with that of our colleagues in England and Wales.

With a few exceptions, all our patients have consented to their general practitioners being notified of their diagnosis, and in only one instance did that doctor not wish to care for the patient because of the HIV infection. We have now successfully managed three patients with AIDS in the community with the co-operation of the general practitioners, community nursing and social services. Two of these patients received terminal care at home. Co-operation from the funeral services has been exemplary, both in the community and for patients who died in hospital.

CONCLUSION

In Northern Ireland we have been relatively fortunate in having fewer cases of HIV infection reported per 100,000 of population (4·1 per 10^5) than in any other region in the UK.[8] We can only speculate on the reasons for this difference. Homosexual men in the past have left Northern Ireland to express their sexuality in a more liberal and anonymous community such as London. Another factor is

the low incidence of injecting drug misuse in Northern Ireland which is borne out from a number of sources.[27] Both these factors may have conspired to give a disproportionate number of heterosexually transmitted cases of HIV infection. Comparing the overall figures for patients with coagulation defects for the United Kingdom to those for Northern Ireland there is a 41% HIV positive rate with an increase to 59% for severely affected patients,[9] compared to 15·8% and 25% respectively. The lower figure for infection of haemophiliacs in Northern Ireland may be explained by the use of more factor VIII derived from European sources. All factor VIII products became infected eventually but the European material became contaminated at a later date compared to that imported from the United States of America.

Entering the 1990's is a time of hope for better treatment of HIV disease, with a consequent improvement of quality of life and survival time for those infected. Forward predictions of the number of cases up to 1993 for England and Wales have been revised downwards for homosexual males, which reflects a marked change of sexual behaviour in this group of people. Little is known of the sexual behaviour of the population of Northern Ireland, although one study indicated little change in homosexual risk behaviour in Northern Ireland over the period 1981 – 1987 despite a greater awareness in this population of HIV infection and a significantly greater resolve to change sexual behaviour because of perceived risk.[28] Because of this, and the fact that comparison between Northern Ireland and England and Wales may not be valid, we have chosen not to make projections for the 1990's in Northern Ireland. With the foregoing evidence, an awareness of HIV disease in the community is essential for all medical practitioners, and we express the hope that people in our population will recognise the risk of HIV transmission and take appropriate action in their own lives to avoid infection.

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Surgical training posts in Northern Ireland: assessment by surgeons in training

R L E Thompson, B J Rowlands, G W Johnston, T G Parks, S T Irwin

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SUMMARY

Northern Ireland has one of the largest surgical training programmes in the United Kingdom. The surgical trainees' assessment of the quality of training provided has been collated prospectively since 1983, and provides a useful insight into the strengths and weaknesses of the programme, as well as the training value of individual posts.

The overall quality of clinical training in surgery was considered to be well above average, but some registrars felt that supervision of operative surgery could be improved. Clinical research was considered to be of average quality in the teaching hospitals but below average in district general hospitals. In the current climate of restriction of the number of training posts in general surgery, the views of the trainees should not be neglected in assessing which posts are best suited for training.

INTRODUCTION

A rotational surgical training scheme was set up in Belfast over 35 years ago. This has evolved to include a total of about 100 trainees in the senior house officer, registrar and senior registrar grades. The training scheme encompasses all 19 hospitals in Northern Ireland that provide surgical services. The Surgical Training Committee oversees the training undertaken in all the surgical senior house officer posts in Belfast as well as several posts in other hospitals, and all of the registrar and senior registrar posts throughout Northern Ireland. This includes not only general surgical trainees, but also those in the surgical specialties (fracture and orthopaedic surgery, plastic surgery, neurosurgery, paediatric surgery, cardiothoracic surgery, urology) and in the Professorial surgical units. Cross-rotational movement between specialties is possible at senior house officer and registrar levels, and in some instances also in the senior registrar grade.

Department of Surgery, The Queen's University of Belfast, Institute of Clinical Science, Grosvenor Road, Belfast BT12 6BN.

R L E Thompson, FRCS, Surgical Registrar.

B J Rowlands, FACS, FRCS, Professor of Surgery.

Royal Victoria Hospital, Belfast BT12 6BA.

G W Johnston, MCh, FRCS, Consultant Surgeon.

Belfast City Hospital, Belfast BT9 7AB.

T G Parks, MCh, FRCS, Professor of Surgical Science.

S T Irwin, MD, FRCS, Consultant Surgeon.

Correspondence to Mr Irwin.

Substantive appointments in the registrar grade are for two years and senior registrars receive a four year contract in the first instance, which may be extended on an annual basis. Senior house officers have a one year contract initially and must reapply and compete for a place in the scheme on an annual basis. The schedules for annual posting are drawn up by the Surgical Training Committee, and an attempt is made to allocate training posts in line with the career aspirations of trainees. In 1983 the committee approved the introduction of continuous assessment of training standards in all surgical units by the trainees themselves. The results from the first four years of this audit are presented.

METHOD

At the end of each posting a questionnaire was sent to each trainee of registrar or senior registrar status. The questions were scored according to quality of training into five categories (unsatisfactory, below average, average, above average or outstanding). The data was collected by one of the two trainee representatives on the committee and was subsequently analysed on a CP/M based statistical package (AMSTAT).

RESULTS

There were between 53 and 60 trainees on the registrar/senior registrar rotation per year during the four years studied. Some of the postings in surgical specialties were of three or six months duration. A total of 227 questionnaires were sent to 104 registrars and senior registrars, of which 195 were returned. It was not possible to contact some of the overseas trainees who had left Northern Ireland at the end of their contracts (as many as nine in one year).

Table I shows the assessment of various aspects of registrar and senior registrar training. Table II shows the assessment of the teaching and the district general hospitals in the rotation. In the first two year period (1983–1985) the overall scores were rather higher than in the subsequent two years. As the survey progressed, the response rate improved from 57% to 82% in 1984–85, falling to 71% and 76% in subsequent years.

TABLE I

Assessment by Registrars and Senior Registrars

	Registrar responses (n = 123)			*Senior Registrar responses (n = 72)*		
	Unsatis / below average	*Average / above average*	*Out-standing*	*Unsatis / below average*	*Average / above average*	*Out-standing*
	%	%	%	%	%	%
Ward experience	10	62	28	5	67	28
Operative experience	19	54	27	8	56	36
Ward supervision	22	57	21	17	61	22
Operative supervision	27	50	23	17	64	19
Teaching	34	53	13	21	66	13
Meetings	37	49	14	18	65	17
Study time	27	48	25	42	44	14
Research in progress	49	36	15	33	53	14
Encouragement to do research	38	46	16	35	50	15

TABLE II

Assessment of teaching and district general hospitals. (General surgery only)

	Teaching hospitals			*District general hospitals*		
	Unsatis / below average %	*Average / above average* %	*Out-standing* %	*Unsatis / below average* %	*Average / above average* %	*Out-standing* %
Ward experience	0	57	43	5	67	28
Operative experience	0	57	43	16	42	42
Ward supervision	8	51	41	19	65	16
Operative supervision	11	57	32	28	46	26
Teaching	22	73	5	37	47	16
Meetings	22	59	19	59	36	5
Study time	24	68	8	45	35	20
Research in progress	40	49	11	77	21	2
Encouragement to do research	35	51	14	68	30	2

Table III shows the assessment by general surgical trainees undertaking rotational training in specialist surgical units (66 responses). Their views were remarkably consistent with those received from specialist senior registrars in the same units.

TABLE III

Assessment by general surgical trainees rotating through specialist units

	Unsatis / below average %	*Average / above average* %	*Out-standing* %
Ward experience	11	62	27
Operative experience	21	64	15
Ward supervision	18	59	23
Operative supervision	29	51	20
Teaching	21	59	20
Meetings	23	57	20
Study time	21	64	15
Research in progress	29	54	17
Encouragement to do research	30	55	15

Only 62% of trainees had discussed the progress of their training in individual posts with the consultant in charge of those units. Fifty four percent of trainees offered specific comments about the units in which they had worked; many of these were complimentary and almost always constructive. Two comments were particularly common — the need for more direct supervision of operative surgery by consultants, and the desire for better organisation of research within individual surgical units. A total of 21 trainees in the four year survey had filled research posts either as joint appointments (university/NHS) or on research fellowships.

Encouragement to perform research was scored as average (38%), above average (28·5%) or outstanding (33·5%) by these individuals.

DISCUSSION

Considerable interest in surgical training has been aroused in recent years by discussions on the format of the Fellowship examination and the imminent introduction of the 'career registrar' grade. Surprisingly, little attention has been paid to the assessment of the actual quality of surgical training currently being provided within the United Kingdom. Dehn[1] has surveyed registrars undertaking full time research posts and found that 24% felt that supervision of their research was below average. In the present study a comparable proportion of registrars expressed disappointment with both the encouragement to perform research and the actual research in progress. There were 21 responses from trainees engaged in full time research, 38% of whom felt that the encouragement to perform research was average. The remaining 62% of trainees felt that research encouragement was above average or outstanding, while no trainees felt that it was below average. However, 33% of research fellows felt that the quality of their actual research in progress in the department was below average, a figure very close to that reported by Dehn.[1] Surgeons remain obsessed with the concept that 'research' is in some way a measure of surgical ability,[3, 4] and this anxiety is not unique to Northern Ireland.[2]

In a small survey of 25 post-fellowship registrars in the Mersey region, Diggory found similar results to our own.[2] Training in patient management was considered good by 56% of registrars, adequate by 25% and inadequate by 18% (our own figures including pre-fellowship trainees were 62%, 28%, 11% respectively). Diggory considered that operative experience and in particular operative supervision was sometimes inadequate. Registrars in the Mersey region seem to express the same anxieties as our own. Steps are being taken to initiate improvements in supervision of the minority of junior trainees where this seems to have been deficient. This survey did not distinguish between the supervision of elective and emergency cases. Steele et al found that 58% of Scottish trainees felt that there was too little supervision of operative surgery, and that 21% of respondents at times felt 'out of their depth' when performing emergency cases.[5] This worrying situation seems less common in North America.[6]

It has to be accepted that trainees will always express a desire for more experience and supervision in operative surgery, and this must be balanced against the need to complete a reasonable number of cases in the time allotted to each operating list. Junior surgeons will inevitably operate more slowly and this does not encourage consultants to assist them when operating time is limited. Clearly a more detailed analysis of the amount of supervised operating performed by surgical trainees is required.

The clinical training of senior registrars is more closely monitored by the Specialist Advisory Committees in their respective surgical specialties than is the training of other grades of surgeons, and their responses indicate that the clinical training they receive is of excellent quality. Apparent inadequacies in the 'academic' aspects of senior registrar training require further evaluation. Middle grade registrars as a group were rather less satisfied that the senior registrars. While the

posts provided good experience, many felt that supervision both on the ward and in the operating theatre was unsatisfactory. Junior registrars (those at the peri-fellowship stage) were usually adequately supervised and gained satisfactory experience, but over 22% felt operative supervision should be improved. Many trainees felt that there was insufficient time available for personal study and that ward meetings and postgraduate teaching should be improved.

General surgical trainees expressed approval of their training in the surgical specialties. Though they occasionally commented that these posts offered less in the way of operative experience, the scoring suggested that training was of an acceptable standard. The fact that 38% of trainees did not (or felt they should not) discuss their performance with their trainers was disappointing. Perhaps introduction of a compulsory two-way discussion between the trainee and his/her trainer on the completion of each period of training should be considered.

The results of this survey have been presented to the Northern Ireland Surgical Training Committee and consultant surgeons have been sent an overall numerical assessment of the 4 years responses for all units but with only the score for their own unit identified. It will be interesting to assess in future years whether this information has had any beneficial effect on the trainees' assessment of the quality of surgical training. In responding to the questionnaire, trainees were asked to make judgements around a hypothetical average. Clearly they have little experience by which to gauge what is average, especially since few have worked outside Northern Ireland. Nevertheless, only a minority of responses were scored 'average', clear opinions being demonstrated, perhaps more in comparison of the training value of the post with the expectation of what is 'adequate'. We have found this prospective evaluation by trainees a useful adjunct in the audit of training standards. The rotational training scheme has been well received, though significant deficiencies have been indentified. In particular, the quality of supervision of operative surgery should be critically assessed by trainers. It is a useful stimulus for a consultant surgeon to know that it is not just his registrar whose performance is being judged.

We are grateful to the members of the Northern Ireland Surgical Training Committee for their co-operation with this survey and to the trainees on the training scheme who have completed the questionnaire. Professor A D Roy and Mr A J Wilkinson played a vital part in the introduction of this assessment.

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July 1st 1916 — a surgical catastrophe

H Ellis

The Sir Thomas and Lady Edith Dixon Lecture for 1990

On the morning of July 1st 1916, after five days of intense bombardment, the British Fourth Army under General Sir Henry Rawlinson, with a ration strength of 519,324 men, supported by two divisions of the Third Army, under General Sir Edward Allenby, advanced into what was to be known hereafter as the first day of the Battle of the Somme. Within the first 60 minutes of that attack, those troops sustained some 30,000 casualties, dead, dying and wounded, and that number would be almost doubled by the end of the day.

This lecture, founded in memory of Sir Thomas and Lady Edith Dixon, tries to convey to you how the Royal Army Medical Corps coped with the most enormous casualties in wounded ever sustained by our armed forces in any one day of any campaign before or since. Before considering the purely medical aspects of that day, let me briefly describe the military background of the battle.

In 1915 had been the abortive attempt to break the stalemate on the Western Front by the Allied landings at Gallipoli. The Allied plans for 1916 were for combined French and British attacks on the West with a simultaneous Russian advance in the East. However, the German attack at Verdun in February 1916 rendered the French army incapable of joining in a combined offensive on a large scale, and made the French, moreover, desperate for relief from their British Allies. But the old British regular army had almost gone — decimated in the early battles of 1914 and 1915 and at Gallipoli. The British Expeditionary Force casualties in 1914 alone had amounted to 86,000 men. Kitchener's "New Army" of half a million volunteers was still training, was largely untested in battle, and had few experienced officers. In the original plan, the French were to advance on a 25-mile front, while that of the British stretched north for another 18 miles. Because of Verdun, the French front was reduced to eight miles. The French High Command issued what almost amounted to an ultimatum; they told Sir Douglas Haig, Commander in Chief of the BEF, that the French Army would not be able to hold out after July 1st, a date earlier than Haig himself would have wished.

The plan of action

Sir Henry Rawlinson's plan was for an intensive artillery barrage which would destroy the German front-line trenches, which occupied sloping and commanding ground overlooking the British line. The attackers, heavily equipped, would systematically occupy the German first line and beat off any counter-attack. The artillery would then destroy the second line, which would be occupied in turn.

Professor Harold Ellis, CBE, DM, MCh, FRCS, Department of Anatomy, University of Cambridge, Downing Street, Cambridge CB2 3DY. Late Consultant Surgeon to the Army.

The Fourth Army, supported by elements of the Third Army on its left, having broken through the German lines, would enable the Reserve Army (Lt General Sir Hubert Gough), with its three cavalry divisions, to break through into clear country beyond.

There were two dreadful snags to the Rawlinson plan. First, the artillery was not sufficiently heavy nor sufficient in numbers to destroy the German deep and heavily reinforced dug-outs nor to cut the barbed wire entanglements. Second, our heavily laden troops could not move quickly enough to occupy the enemy trenches and to destroy their dug-outs before the German machine gunners could emerge from their largely-undamaged deep shelters to re-man their guns. These two factors together proved fatal to the British Fourth Army.

Indeed, the obstacles facing the British along that 18 mile front were daunting. In addition to the fact that the German trenches were situated on high ground overlooking the British lines, these were supplemented by fortified redoubts and no less than nine heavily fortified villages, the names of which have been burnt into the history of the British Army. From south to north these were: Montauban, Mametz, Fricourt la Boissells, Ovillers, Thiepval, Beaumont Hamel, Serre and Gommercourt.

In spite of the formidable opposition there were some successes that day. On the extreme right flank, adjacent to the French, the 30th Division captured Montauban, although Rawlinson refused to allow the cavalry to exploit this advantage. Further north, at Thiepval, the Ulster Division made significant advances at great speed; so much so that troops encountered our own artillery barrage. Later that day, unsupported on either flank and infiladed with machine-gun fire, the Ulstermen had to fall back. Their casualties were enormous — 5,500 killed and wounded. No less than four of the nine Victoria Crosses awarded that day went to men of this division.

Medical planning

Detailed arrangements had been made for the reception of the inevitable heavy casualties from the battle. The lines of evacuation were as follow: –

1. Battalion stretcher-bearers were increased from 16 to 32 per battalion for evacuation of the wounded to the regimental aid post (RAP).
2. From the regimental aid posts, wounded were to be collected by field ambulances using wheeled stretchers, hand carriages on trolley lines and horse wagons or motor ambulances, especially at night.
3. The field ambulances would distribute the wounded to: –

   a) Walking wounded collecting points, where fit enough wounded were marshalled to make their own way to the rear, b) Advanced dressing stations (ADS), c) An advanced operating centre of 40 beds for urgent (and especially for abdominal) cases.
4. From the advanced dressing stations wounded were evacuated to main dressing stations, mainly using the motor ambulance transport of the field ambulances, but patients could also be evacuated directly from the ADS to the advanced operating centre or to casualty clearing stations (CCS) allocated for urgent cases.

5. From the casualty clearing stations patients were to be evacuated mainly by ambulance trains but also by motor ambulance convoys and canal barges to base hospitals.

At the regimental aid post only the most elementary first aid could, of course, be given, supplemented by an injection of morphia. At the field ambulance, essential life saving surgery was carried out. This comprised amputation of completely smashed limbs and control of haemorrhage, preferably by ligation of the blood vessel. If this was not possible, plugging of the wound or direct pressure was used, but patients were not to be sent back with a tourniquet on the limb. The bulk of the surgical work was carried out at the casualty clearing stations together with the advanced operating centre. However, at times of great pressure, patients might have to be evacuated further to the rear before even emergency surgery might be possible.

Operating theatre of No. 3 Casualty Clearing Station, July 1916.
(Reproduced with permission of the Imperial War Museum, London).

The casualty clearing stations were to be the mainstay for dealing with urgent surgical cases. These were designed to admit between 150 and 300 casualties at a time and a rotation system was to be employed so that these could be rapidly cleared. At the beginning of the battle the Fourth Army had 14 casualty clearing stations together with one advanced operating centre with its 40 beds, ready for casualties. The lines of communication and base hospitals in France had 61,000 beds and more than 30,000 of these were vacant, ready and waiting to receive casualties on July 1st. Essential for the rapid evacuation plans were the ambulance trains. Rawlinson himself stressed the importance of these and personally asked

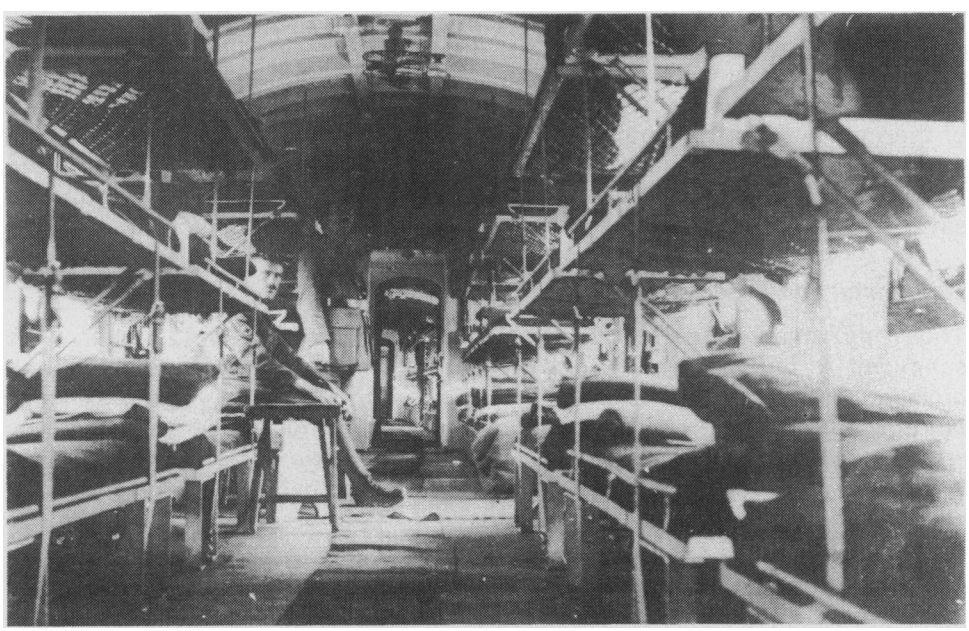
that 18 trains should be made ready for the first day of the battle. In the event, these proved to be, as we shall see, the weak link in the evacuation lines.

The casualties

On that first day, 57,000 casualties were sustained by the British Forces — more than the combined losses for the whole of the Crimean, Boer and Korean wars. There were two casualties for every yard of the front: imagine a line of men, shoulder to shoulder, stretching from Westminster Abbey to St Alban's, all dead or wounded by the close of July 1st — indeed it seems *beyond* imagination.

During the first day of the battle the field ambulances dealt with 863 officers and 22,826 other ranks. Of these, over 14,000 were evacuated to the casualty clearing stations. On the morning of July 1st but a single ambulance train was available. Two more ran that afternoon and two more arrived at midnight. These five trains evacuated some 3,200 cases, many of them left over from the previous day and 647 of them were in fact medical. On the night of July 1st/2nd, the casualty clearing stations held over 12,000 cases, far in excess of their capacity. Yet the flood of wounded continued to arrive at the overflowing CCSs — on July 2nd, 13,800 and on the 3rd, 8,800 casualties were received.

At this point it is worth bearing in mind that the usual allocation to each casualty clearing station was 15 medical officers and 15 nurses (the closest that women got to the front in World War I) — hardly a lavish number of staff — together with about 70 NCOs and other ranks. Of course, the vast numbers of casualties swamped the medical services at every level. Many were lying out in the battle-field on the morning of July 2nd when heavy rain drowned unknown numbers of them. Wounded men from the first day of the battle were still coming back in



Interior of ambulance train at Boulogne.
(Reproduced with permission of the Imperial War Museum, London).

considerable numbers by July 5th and one private, wounded on July 1st near Beaumont Hamel, was brought in on the fourteenth day.

Tremendous efforts were made to clear the base hospitals for the influx of casualties. The hospital ships brought 5,600 wounded to the United Kingdom on July 3rd and each day the numbers increased. The peak was on July 6th, when nearly 12,000 wounded were evacuated by ship to the home ports.

Surgical management

How were casualties dealt with in 1916? In the early days of the war, a whole variety of antiseptics were applied to and within the wound. But Listerian methods, adequate for the trauma of civilian life, were soon found to fail hopelessly in the face of the massive injuries produced by shot and shell. Gas gangrene was more common than in any other war before or since, due to a combination of extensive tissue injury and the fertile soil of Flanders. Tetanus complicated 8·8 per 1000 of all wounds in September 1914.

By 1916 the lessons had been learned. Wounds were dressed at the field dressing stations and wide excision performed at the casualty clearing station, with removal of all damaged tissue and particularly of any foreign body. Dry gauze was used to pack the wound and delayed primary suture then performed four or five days later at the base hospital — a technique which has been used ever since. This, combined with tetanus prophylaxis given at the field ambulance, had reduced the incidence of tetanus to the region of 0·2 per 1000. Gas gangrene, however, was still encountered when there was delay in the wounded soldier receiving definitive surgery.

The Thomas splint was in widespread use by the end of 1915 and proved to be a great life saver. Modifications of the splint were also used for upper limb fractures. Compound skull injuries were treated by careful excision, and Harvey Cushing had taught how a glass sucker could be used to débride pulped brain. Removal of the missile from the wound tract was important and this was helped by the availability of X-rays at the casualty clearing station. The scalp wound was closed by primary suture, if necessary by flap rotation. Many lives were undoubtedly saved by the recently introduced "tin helmet".

Abdominal and vascular injuries

Those abdominal cases surviving to reach the casualty clearing station were submitted to laparotomy. Perforations of the small bowel were sutured with drainage, or resected if extensive. Perforations of the colon were sutured if small but otherwise exteriorised. The mortality of bowel injuries was very high: for the small intestine in the region of 65% and for the colon in the region of 59%. Wounds of the stomach were sutured as were wounds of the bladder, which were closed with catheter or suprapubic drainage.

In spite of the pioneer work of Carrel, who had shown how to suture arteries in the experimental laboratory, arterial reconstructive surgery was virtually unknown. Major arteries were ligated and frequently, especially in the presence of an associated fracture, amputation was more or less inevitable — a finding made again in World War II.

Surgery at base hospitals

At the base hospitals there was much to do. Excised wounds required secondary suture. Many urgent guillotine amputations required revision. Gas gangrene was not rare, particularly where surgery had been delayed, and again amputation might prove necessary. A particularly serious problem was wound infection. After much experimentation, irrigation of the wound with hypochlorite solution through multiple tubes (the Carrel-Dakin technique) or packing with BIPP (bismuth iodoform and paraffin) as advocated by Rutherford Morison of Newcastle were in common use. Secondary haemorrhage, resulting from infection, was not uncommon and would require arterial ligation and perhaps amputation. Dreadful injuries of the face, with extreme mutilation, were particularly difficult and the pioneer work of men like Harold Gillies laid the foundations of modern plastic surgery. The invention of the endotracheal tube by Ivan Magill (an Ulsterman) contributed greatly to the safety of anaesthetising men with maxillo-facial injuries.

RAMC casualties

In the First World War, battalion medical officers frequently left their regimental aid posts and, together with their stretcher bearers, went out in close support of their men across no-man's land. The consequence of their heroism was a very high casualty rate. On the Somme, 52 officers and 406 other ranks were killed; 188 officers and 2,107 other ranks were wounded. Among the dead were no less than 43 infantry battalion medical officers.

There were numerous individual acts of great heroism. On that first day of the Somme, Captain John Green, RAMC, attached to the Sherwood Foresters at Gommecourt, although himself wounded, went to the assistance of an officer who had been wounded and was hung up in the enemies' wire entanglements. He succeeded in dragging him to a shell hole, where he dressed his wounds. He then carried the wounded officer to cover under a hail of bombs and rifle grenades, but he was hit again and killed before he could reach the British lines. The officer died that night and Green's body was not found until eight months later. He was 27 years of age. He was awarded a posthumous Victoria Cross.

Two more doctors were to receive the VC during the Somme. Major William Barnsley Allen was decorated for his devoted care of the wounded under shell fire although he himself had been wounded four times. By the end of the war he had also received the DSO, and the MC and Bar. He returned to general practice in Hounslow, where he remained until his death in 1933. Captain Noel Godfrey Chavasse, who had already been awarded the MC, received his VC for rescuing wounded under fire on October 26th at Guillemont. He gained a posthumous Bar to his VC in August 1917, again for rescuing wounded under fire. He died of his wounds.

The Battle of the Somme ended on November 14th 1916. During those 140 days the British sustained 400,000 casualties and advanced six miles. What lesson can we learn? First, that human flesh and bones are no match for high velocity missiles, nor can bravery alone overcome machine gun fire over open sights. Second, that under extreme adversity, men can show a degree of courage that goes beyond our imagination. Third, that the Royal Army Medical Corps can look back with a mixture of pride and humility at the tenacity, fortitude, bravery and downright hard work of its grandfathers on July 1st 1916.

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Care of the elderly in North and West Belfast

A Hussain, D H Gilmore, T R O Beringer, Vivienne Crawford, D Grant, Ann Montgomery

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SUMMARY

A survey of all elderly people aged 65 years and over from North and West Belfast receiving long-term care in residential and nursing homes, and in psycho-geriatric and geriatric care was undertaken. A total of 967 subjects was studied and physical dependency and mental impairment documented. The high dependency of residents in geriatric and psycho-geriatric care was highlighted, with greater levels of dependency than among those receiving nursing home care. Professional assessment prior to admission should be common to all long-term care facilities and is essential if services for the projected demographic increase in numbers of very elderly people are to be provided, and inappropriate admission and expenditure avoided.

INTRODUCTION

The pattern of care for dependent elderly people continues to evolve, with increasing emphasis on community support to enable them to be maintained in their own homes. This has been accompanied by an expansion in the provision of non-statutory nursing home and residential home accommodation. The government document People First: Community Care in Northern Ireland in the 1990's[1] has major implications for the role of nursing home, residential home and hospital care of the elderly.

The present elderly population of North and West Belfast is approximately 22,000 over the age of 65, with 8,100 over the age of 75, out of a total population of 168,300. The projected increase in the population over the age of 65 between

Geriatric Medical Unit, Royal Victoria Hospital, Belfast BT12 6BA.
A Hussain, MB, MRCP, Senior Registrar.
D H Gilmore, MB, MRCP, Consultant Physician.
T R O Beringer, MD, MRCP, FRCPI, Consultant Physician.

Department of Geriatric Medicine, The Queen's University of Belfast, Whitla Medical Building, Belfast BT9 7BL.
Vivienne Crawford, BSc, MSc, Research Associate.

Psychiatric Unit, Mater Infirmorum Hospital, Belfast BT14 6AB.
D Grant, MB, DMH, Senior House Officer.
Ann Montgomery, MB, MRCPsych, Consultant Psychiatrist.

Correspondence to Dr Beringer.

1991 – 1996 is 2·3% and the population over the age of 85 will increase by 23% during this 5 year period.[2] The future demands on services for the elderly will be considerable. Central to whatever pattern of care evolves is the accurate assessment of need, and the appropriate targeting of available resources. To identify services required within the present pattern of care a survey to assess mental and physical disability was undertaken of all elderly people in institutional care in North and West Belfast.

METHODS

The survey was carried out between January and July 1989. The proprietors of the private and voluntary residential and nursing home establishments registered in North and West Belfast were approached. The purpose of the survey was explained, and agreement to participation obtained. Agreement to approach residents in statutory residential care was obtained from senior social work officers, and from senior medical staff to approach patients in geriatric and psycho-geriatric care. Permission was also sought from the appropriate general practitioners. All patients resident in the psycho-geriatric facility for North and West Belfast situated in Purdysburn Hospital were included in the survey, regardless of previous home address or age. The residents and patients were then visited individually by a physician trained in the care of the elderly. A standard proforma was completed which included age, marital status, home address and address admitted from, date of admission, whether supplemented or self-financing if applicable, and drug therapy. A Barthel Index[3] of activities of daily living was completed with help from the attendant staff, the score varying from 0 (severely disabled) to 20 (fully independent). This is a simple index of independence to score the ability of a person to care for himself. A mental test questionnaire[4] was also completed, the score ranging from 0 (severely confused) to 10 (normal). A postal survey was carried out of nursing and residential homes in the remainder of Northern Ireland outside North and West Belfast to identify the number of residents originally domiciled in North and West Belfast who had chosen to move outside this area for care.

All data were analysed using SPSSX on the ICL 2988 mainframe computer at the Queen's University of Belfast.

RESULTS

A total of 967 subjects was surveyed. There were 248 residents in private and statutory residential care, 347 in voluntary, charitable or private nursing home care, 112 in psycho-geriatric care and 260 in geriatric hospital care. The overall ratio was 3·7 females to 1 male. The age distribution and home address in each of the four categories is shown in Table I. The nursing home sector has the highest proportion of residents aged less than 65 years, and also the highest proportion whose home address is outside North and West Belfast. The postal questionnaire of nursing homes outside North and West Belfast identified 20 females and 5 males originally from North and West Belfast, and 43 females and 14 males in private and residential homes outside North and West Belfast. The residential sector received 65% of admissions from home, 20% from hospital, geriatric and psycho-geriatric care and 8% from other hospital sources. The nursing home

sector received 53% of admissions from home, 4% from hospital, geriatric and psycho-geriatric care, and 32% from other hospital sources. The psycho-geriatric sector received 63% of admissions from home, 23% from hospital and 14% from residential homes. The geriatric sector received 65% of admissions from home, 24% from hospital and 11% from residential homes.

TABLE I

Age structure and home address of 967 subjects

	n	*Mean years*	*Age (range)*	*Age less than 65 yr*	*Home address* *North and West Belfast*	*Outside North/West Belfast*
Residential home	248	82·4	(54–100)	8 (3·2%)	220 89%	19 8%
Nursing home	347	82·4	(40–101)	23 (6·6%)	229 66%	105 30%
Psycho-geriatric care	112	81·0	(52–100)	2 (1·8%)	95 85%	17 15%
Geriatric care	260	82·7	(63–107)	3 (1·2%)	236 91%	22 8%

The lengths of stay are shown in Table II for each of the four categories. Some of the facilities in each category were opened less than five years prior to the survey and this would be reflected in the pattern of their lengths of stay. Similarly, other psychiatric institutions such as Purdysburn Hospital have a number of patients who were admitted at a young age and remained in institutional care before passing into the geriatric sector.

TABLE II

Length of stay of 967 subjects recorded at the time of survey

	n	*1 yr*	*1 yr*	*2 yr*	*3–5 yr*	*>5 yr*
Residential home	248	53	38	41	43	73
Nursing home	347	117	78	42	52	58
Psycho-geriatric care	112	35	21	20	10	26
Geriatric care	260	132	35	23	33	37

The Barthel index scores and the mental scores are shown in cross-tabulation form for residential home subjects, nursing home residents, psycho-geriatric patients and geriatric hospital patients in Table III. The subjects with the lowest mental scores (0–3) combined with the lowest Barthel scores (0–4) are the most heavily dependent and confused. In residential homes 4% fall into this category, with 12% in nursing homes, 13% in psycho-geriatric care, and 33% in hospital care. Conversely subjects with the highest mental scores (8–10) and Barthel scores (15–20) are largely independent and not confused. In residential homes 28% fall into this category, with 26% in nursing homes, 1% in psycho-geriatric care and 6% in hospital care.

TABLE III

Mental scores correlated with Barthel scores for the four groups of subjects

			Mental score			
			0–3	*4–5*	*6–7*	*8–10*
Residential home	Barthel score	0–4	9	3	4	—
(246)		5–9	17	4	—	6
		10–14	32	14	11	18
		15–20	18	14	26	70
Nursing home	Barthel score	0–4	40	13	9	4
(336)		5–9	19	13	7	20
		10–14	17	19	11	36
		15–20	11	16	14	87
Psycho-geriatric care	Barthel score	0–4	14	—	—	—
(111)		5–9	48	—	—	—
		10–14	31	2	1	—
		15–20	9	3	2	1
Geriatric care	Barthel score	0–4	83	11	13	13
(254)		5–9	26	12	8	17
		10–14	9	3	11	27
		15–20	3	2	2	14

In the nursing home sector 293 patients (84%) were receiving supplementary financial support. This approximates to an annual cost of £3·5m in North and West Belfast, assuming an average financial supplementation of £200 per week. The proportion of subjects at present in care in one or other of the residential home, nursing home, psychiatric and geriatric care groups is shown in Table IV. The projected changes in the population by 1996 are included, and adjustments to the current numbers of beds available in the present facilities have been projected, which indicates the need for an overall 11% growth by 1996 if the present pattern of care is to continue.

DISCUSSION

The major strength of this study is the uniform method by which information has been gathered from the four separate components providing care for those elderly no longer able to remain at home in North and West Belfast. The major weakness is the absence of similar information on those remaining at home and cared for by their families and community services. Although the assessment tools (Mental test score and Barthel index) are not designed to assess behavioural disorders or social circumstances contributing to admission to care, they are well established methods of measuring confusion and independence, two factors which often determine need for care outside the home.

TABLE IV

North and West Belfast: Residential home, nursing home, psycho-geriatric and geriatric hospital care.
Proportion of subjects in care by age, and projected placement needs by 1996

Age: yr	*65 – 74*	*75 – 84*	*85 +*	*Total*
No. of placements in 1989	112	362	388	862
% of total placements	13%	42%	45%	100%
No. of people age > 65 in N/W Belfast	14,000	6,500	1,600	22,100
Proportion of these in care in 1989	1%	6%	24%	3·9%
Projected population change 1991 – 1996	−0·4%	+1%	+23%	+2·3%
Projected additional placement needs by 1996	−0	+4	+89	+93 (11% growth)

In the residential sector a total of 70 subjects (28%) have a normal mental score (8 – 10) and a Barthel score of 15 – 20 which indicates a high degree of independence without confusion. While social and behavioural factors contributing to admission were not assessed it is likely that a substantial number of these residents could remain at home if improved home care support was available as an alternative to residential care.

In the nursing home sector 7% of the residents are aged less than 65, showing that these facilities are not used exclusively by the elderly. Also, 30% of the residents came from home addresses outside North and West Belfast indicating that such facilities, although sited in one health district, may care for patients from other surrounding districts. A surprising number of nursing home residents, 87, (26%) were mentally normal with a score of 8 – 10 and had a good Barthel score of 15 – 20 indicating a high degree of independence. A substantial number of these residents could be cared for at home if improved care was available, or in less costly residential homes.

There were 160 subjects whose length of stay was greater than 6 months in hospital and who may be deemed unlikely to recover independence to enable them to return home or to a residential home and who therefore require long-term nursing care. Current residents in geriatric hospital care are heavily dependent, 33% with a mental score of 0 – 3 and a Barthel score of 0 – 4 which supports the conclusion that these facilities are appropriately used. A similar appropriate pattern of limited physical ability in addition to mental impairment is present in the psycho-geriatric care facilities.

This survey establishes that at present elderly people in North and West Belfast occupy 277 places in residential care (34/1,000 over the age of 75), 254 places in nursing home care (31/1,000 over the age of 75), 95 places in psycho-geriatric care (12/1,000 over the age of 75) and 236 places in hospital geriatric

care (29/1,000 over the age of 75). This means that there are 106 places/1,000 people over the age of 75, or that 3·9% of the total of 22,100 people over the age of 65 are presently receiving care in either hospital, residential or nursing home facilities. This is lower than the reported figure of 5·6% of old age pensioners in institutional care in Scotland.[5] There is clear evidence of major inappropriate placement in the nursing home sector. Similar findings of lower levels of nursing dependency have been reported in registered nursing homes in Edinburgh[6] and West Glasgow[7] in comparison to geriatric long-term care wards. This is in contrast to Brighton[8] where a larger proportion of residents in private nursing homes required heavy nursing than in the long-stay hospital wards. The provision of 5 beds/1,000 population aged 65 and over in Brighton is much lower than the 11·5/1,000 hospital beds available in North and West Belfast indicating a significantly different pattern of care, although psycho-geriatric provision was not included in the overall analysis from Brighton. It is evident that at present in North and West Belfast nursing home care and long-term hospital care are providing for elderly people with significantly different levels of dependency, with lower dependency in nursing home care and high dependency in hospital care. If the number of elderly in hospital care falls, there will be an accompanying rise in dependent elderly who will require care in nursing home accommodation. At present these two facilities are not providing for similar populations, and should not be viewed as comparable.

We believe that the present lack of formal assessment before admission to nursing home care is invidious and costly, and may deprive some of the elderly of more appropriate community care. There is evidence from this study that strengthened community services would allow a proportion of the fitter residents of nursing home and residential home facilities to remain in their own homes. A substantial number of the elderly will nevertheless continue after appropriate assessment and treatment to require long-term nursing care, and it is essential that provision of such care on the basis of need continues to be available. The projected demographic changes in numbers of elderly people will result in the largest increase occurring in the very elderly section of the population which currently consumes the greatest proportion of resources. At present 24% of the over 85 year-olds are receiving long-term residential home, nursing home or hospital care and an 11% increase in resources will be required to maintain the present provision of care over the next 5 years alone. If the expectations of the projected demographic increase in numbers of very elderly are to be effectively met, skilled professional pre-admission assessment should become common to all long-term care facilities. This will allow the allocation and targeting of care to individual need, at home or in long-term care, and reduce the present level of inappropriate admission and expenditure.

We acknowledge the help of all those who care for the elderly from North and West Belfast and for their co-operation in allowing us to survey the residents of their individual facilities. We are also grateful to Miss Gillian Reid for assistance with data handling and Mrs Brenda Ferris for typing the manuscript.

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Historical Note

Doctor Sanders' silver lancet case

J S Logan

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Some years ago Mr Ronald Cohen, a dental surgeon, of 2 Old Square, Warwick, purchased in Devon a little silver lancet case. It no longer contained lancets, but small though it was, it was of admirable workmanship and handsome appearance. It bore the following inscription in minute lettering:

Presented to
J.M. Sanders Esq M.D.
by
the Students of the Practical Anatomy Class
in the Royal Belfast College
April 1836

Sanders had been on the surgical staff of the Fever Hospital in Frederick Street, Belfast, now the Royal Victoria Hospital, from 1838 to 1846. With great kindness Mr Cohen, through Professor Stoy, presented the silver lancet case to the Royal Victoria Hospital. It is illustrated here in the photograph.

Doctor J M Sanders' silver lancet case.

Doctor J M Sanders, 1814 – 1846.

Correspondence to Dr J S Logan, Honorary Archivist, Royal Victoria Hospital, Belfast BT12 6BA.

James Maxwell Sanders (his name was occasionally spelt Saunders) was assistant to Doctor James Lawson Drummond, professor of anatomy and physiology in the collegiate department of the Belfast Academical Institution (Royal from 1831). The minutes of the Joint Boards of the Institution[1] record that on 3 May 1836 "Doctor James Drummond presented through Mr Robert James Tennent an address from the students of the anatomical class to Doctor Sanders, assistant to Doctor Drummond, expressing in strong terms their sense of his great merit, and presenting him with a case of lancets". One hundred and thirty-nine years later the lancet case returned to Belfast, but nothing is known of the text of the address.

Sanders was born on the 24 April 1814. A G Malcolm[2] tells us that while he was still only three years of age both his parents died and he was brought up by a paternal uncle and aunt. His schooling began in Glasgow, but when he was twelve years old the family removed to Belfast, and his education was continued at the Academical Institution until May 1830. According to Malcolm he began his medical training in Belfast. There was no formal medical school in the town until 1835, so the opportunities locally for medical training were in the department of anatomy and physiology in the Academical Institution, and in pupilships with the local physicians and surgeons in their practices. The committee of the Fever Hospital had authorised the admission of the pupils of the physicians and surgeons on the staff "to see the practice of the hospital" on the 16 January 1820.[2] David Moore[3] writing the surgical report of the Fever Hospital for the year ending 31 March 1845 states that he himself was the originator of clinical instruction in the hospital, and that when he joined the staff in 1821 there were no pupils. At the committee meeting on 16 June 1822[4] it was resolved that Mr Francis Archer be allowed to visit the patients in the hospital along with the surgeons, Mr Moore becoming responsible for his conduct and his conforming to the regulations respecting pupils. Evidently Sanders took advantage of the opportunity, for T H Purdon[3] writes, in early 1846, of those who "have acquired, in part, their professional knowledge at this hospital, among whom it may not be invidious to mention my colleague Dr Sanders, whose lamentable illness has excited such warm and just sympathy". These pupils were not resident. Residence came later.

Sanders continued his studies in Dublin, Glasgow and Edinburgh. He was licensed to practise surgery by the Royal College of Surgeons of Edinburgh on 25 April 1835, and on the 1 August of the same year received the degree of M.D. from the University of Edinburgh. His thesis was on delirium tremens. In 1836, aged 22, he was appointed a medical attendant in the Belfast Dispensary to Number 2 district, the area of the town bounded by the north side of York Street, the upper part of Donegall Street and the new Cave-Hill road on the east. In 1838 he was appointed to the surgical staff of the hospital. Besides doing the duty of surgeon in the hospital, he continued to attend the sick in Number 2 district until his last illness overtook him. Robert Esler, when presenting the portrait of Sanders (by the kindness of Professor Dill) to the Ulster Medical Society in the Session 1884–85, said that Sanders, in the General Hospital, "distinguished himself as a brilliant operator". He was married on 12 December 1843[5] at Donaghadee to Marianne Barnsley, eldest daughter of Richard Barnsley of Lisburn. He died, no doubt of pulmonary tuberculosis, on 26 July 1846 aged 32 at Shrubhill[6] and was buried in the New Burying Ground, the present Clifton Street Cemetery. The Reverend James Morgan of Fisherwick congregation preached the funeral sermon.

It should be remembered that Sanders helped, or helped to form, in Belfast a branch of the Royal Medical Benevolent Fund of Ireland. At a meeting of the committee of the Fever Hospital on 11 February 1843 leave was given to Doctor Sanders to hold a meeting of medical practitioners in the library of the hospital for the purpose of establishing the branch. Since then the fund has relieved many widows and orphans of medical men. He was secretary of the Belfast Medical Society from 1838. Malcolm credits him with the systematic institution of the reading of papers on medical and surgical subjects at the monthly meetings. This must in the past have been at least occasional, for on the 4 November 1822 Doctor McDonnell and Mr Coffey reported two cases of laryngeal cyanche.

Malcolm says that "none, probably, at his early age, ever before enjoyed so high a place in the public mind". "His ardent temperament stimulated him to labour without ceasing, and induced him to listen to every call of distress". "His kindness of manner and gentleness of deportment, combined with an excellent education and the strictest moral and religious principles" contributed to establish his success. We have the text of the memorial inscription erected by those "to whom he was greatly endeared by the amiability and benevolence of his disposition, the integrity and purity of his life, the accomplishments of a liberal education and the highest professional attainments". The inscription declares that "The righteous shall be in everlasting remembrance". That is not often true, but happily Mr Cohen's kindness and the little lancet case have recalled to us Sanders' exemplary life and work.

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6. The Northern Whig, Belfast. 30 July 1846. Shrubhill has not been identified.

In Malcolm's History, appendix iv, page vii, the word physicians at the head of the right hand column is an error. It should be deleted and surgeons inserted.

The important assistance of Mrs E O Russell, secretary of the Archives of the Royal Victoria Hospital, in the investigation of Doctor Sanders' life and work is gratefully acknowledged.

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Case report

Thigh infection: a rare complication of colonic perforation

W J Campbell, W G Humphries

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INTRODUCTION

Thigh infection is a rare complication of intra-abdominal sepsis. We report two cases of infection in the thigh resulting from colonic perforation; one patient subsequently developed necrotising fasciitis, a rare and often fatal condition affecting subcutaneous tissues characterised by spreading inflammation along fascial planes with initial sparing of overlying skin and underlying muscle.

CASE REPORTS

Case 1. A 55-year-old woman was initially referred for a gynaecological opinion with a history of crampy lower abdominal pain; a large bowel lesion was suspected and a barium enema undertaken. Before the results of this X-ray were known she was admitted urgently to the medical unit where a history of tiredness and weight loss of 1 – 2 stones in the previous two months was obtained. She also suffered from arthritis and hypothyroidism for which she was being treated with a non-steroidal anti-inflammatory drug and thyroxine 100 µg daily respectively. On admisison she was noted to be pale (haemoglobin 10·1 g/100 ml) with a leucocytosis (WCC 32 x 100^3, 91% neutrophils), and an ESR of 9 mm/hr. On the next day she developed a pyrexia of 39·6°C for which no cause was identified and she complained of severe pain in her back. The barium enema performed prior to admission had revealed diverticular disease with a persistent irregularity in the mid pelvic colon consistent with a neoplasm. Three days after admission she was transferred to the surgical unit for flexible sigmoidoscopy, but this was not possible due to faecal loading of the rectum. On that evening she again developed a pyrexia of 39·4°C. Full blood picture, blood cultures, sputum, and urine for organisms and sensitivities were obtained and she was commenced on antibiotic therapy with mezlocillin 2 g three times daily. Forty-eight hours later she complained of further pain in her abdomen, back, and right hip. On examination she was noted to have tenderness in her lower abdomen with muscle guarding and rebound. The right thigh was erythematous and held in a flexed

Department of Surgery, The Queen's University of Belfast, Belfast City Hospital, Belfast BT9 7AB.
W J Campbell, FRCS, Research Fellow.

Waveney Hospital, Ballymena.
W G Humphries, MD, FRCS, Consultant Surgeon.

Correspondence to Mr Campbell.

position. Passive extension of the hip caused considerable pain. Straight X-ray of the abdomen suggested a mass in the right iliac fossa and surgical emphysema in the pelvic tissues.

In view of these findings emergency laparotomy was undertaken at which numerous small bowel adhesions were found in the lower abdomen with surgical emphysema visible and palpable in the pelvis. An abscess had formed postero-lateral to the rectum on the left side of the pelvis due to a perforated stenosing carcinoma in the mid sigmoid colon. A Hartmann procedure was undertaken after sigmoid colectomy. On the second postoperative day she complained of pain in her right hip similar to the pain she had suffered for many years as a result of her arthritis. The thigh was inflamed by the 7th day and by the 11th postoperative day she had developed a fluctuant area on the lateral aspect of her right thigh approximately 10 cm above the knee joint. On the next day a 6 cm incision was made in the lower part of the lateral aspect of the thigh, revealing marked destruction of the subcutaneous tissues with sparing of the overlying skin and underlying muscle and releasing one litre of pus. A large drain was inserted into the space which appeared to extend up to the greater trochanter. A mixture of *Strept. viridians, Coliforms,* and *Proteus* species were found on culture of the pus.

Her general condition failed to improve despite treatment with mezlocillin, gentamicin and metronidazole and high calorie intake by both enteral and parenteral routes. A sinogram was performed through the drain revealing a communication between the thigh abscess cavity and the pelvis through the sacrosciatic notch. Subsequently her thigh was incised from the greater trochanter to the lateral condyle of the femur when the necrotic fascia lata was excised and the communication with a large pelvic abscess laid open. Six hours postoperatively the patient developed septicaemic shock and died. Pathological examination of the sigmoid colon revealed a perforated Duke's B adenocarcinoma.

Case 2. A 66-year-old male was admitted with a four week history of lower abdominal pain radiating to his left flank. The pain had been so severe that for three weeks he had been confined to bed with a diagnosis of possible sciatica. On the day of admission the pain had become worse and he had not passed urine for 12 hours. There were no other gastrointestinal or genitourinary symptoms. He was pyrexic (38°C) and looked ill. He was tender in the left renal angle and left flank, with pitting oedema. There was tenderness and guarding in the left lower abdomen and bowel sounds were absent. A urinary catheter was inserted obtaining 700 ml of foul-smelling urine, but no organisms were noted on direct microscopy or on subsequent culture. Haematological investigations revealed a leucocytosis (23×10^3/ml). Blood urea was elevated to 22·7 mmol/l. X-rays revealed gas in the soft tissues of his left thigh. Blood cultures were taken and therapy with intravenous benzylpenicillin and gentamicin was instituted. Intensive resuscitation was required before laparotomy could be carried out.

At laparotomy through a left Rutherford-Morrison incision he was noted to have subcutaneous gas and pus in the abdominal wall. Pus originating from perforated diverticular disease of the pelvic colon extended throughout the peritoneal cavity. Peritoneal toilet was undertaken, drains were placed in the abdominal and pelvic cavities and a transverse defunctioning colostomy was fashioned. The lateral aspect of his left thigh was incised widely and a small amount of pus and gas

was released. One week later his thigh incision was extended to drain a further collection of pus. On each occasion a mixed flora of *Bacteroides, Coliforms,* and *Streptococci* was cultured. Initially his condition improved but over the ensuing weeks he developed overwhelming sepsis with multi-system organ failure and he died 25 days postoperatively.

DISCUSSION

Subcutaneous emphysema of the abdominal wall or lower limb has been recognised as an unusual sign of intra-abdominal sepsis either from enteric perforation or gas formation in an intra-abdominal abscess.[1] The sepsis may result from both benign and malignant disease. Thigh abscesses more commonly follow local infections such as pyomyositis secondary to trauma, infected haematoma, osteomyelitis, cellulitis or thrombophlebitis.[2] In those cases resulting from enteric perforation the most common sites of perforation are the colon and rectum, with infection spreading into neighbouring extraperitoneal tissues.

Injection of air into the presacral space of cadavers results in surgical emphysema in the lower abdominal wall, thigh, and buttock regions. The routes by which such extension can occur are neurovascular bundles, defects in the abdominal wall, femoral vessels or through the pelvic floor alongside the rectal tissues.[1] In a review of 46 cases of thigh abscess resulting from enteric perforation, Rotstein and colleagues found 39 to arise from the colorectum, four from the appendix and three cases from the small bowel; the common feature of all these cases being perforation into extraperitoneal tissues.[2] The commonest cause of colonic perforation was carcinoma.

It is reported that between three and nine percent of colonic carcinomas will have perforated by time of presentation. This has been considered to be a poor prognostic factor, being associated with operative mortality figures (death within 30 days of operation) of 18–80% and five year survival figures of 12–25%.[3, 4, 5, 6, 7] In one series comparing perforating and non-perforating carcinomas the operative mortality was increased fourfold and the five year survival reduced similarly when the tumour had perforated by time of presentation. This has been attributed to more advanced local disease with a higher percentage of advanced stages, to lower rates of resectability, and to high operative mortality due to emergency and life-threatening initial presentation. Emergency surgery, especially in the elderly, carries a worse prognosis.[3, 5, 6]

Necrotising fasciitis is a rare infection of subcutaneous tissues, resulting in liquefactive necrosis caused by bacterial hyaluronidase and lipase in which the skin and underlying muscles are initially spared; it is associated with a mortality rate of between 30–60%.[8] The infection was described by Hippocrates and Galen in ancient times, and by Meleney in 1924 who named it "acute haemolytic streptococcal gangrene".[9] Giuliano and colleagues undertook bacteriological studies in 16 cases and reached the conclusion that two forms of necrotising fasciitis exist, due either to Group A Streptococci or to a mixed growth of facultative and anaerobic organisms.[10] Necrotising fasciitis affects the extremities most often but can also occur on the abdomen, neck, face, perineum and genitalia[8] and may follow any breach of the protective integument; thus minor trauma, injection injuries, frost bite and compound fractures may all result in this

widespread infection. Biochemically or immunologically compromised individuals such as diabetics, pregnant women, those with renal failure, cirrhosis or patients with an underlying malignancy are especially susceptible.

The clinical course in both types of necrotising fasciitis is identical. Initially there are signs of inflammation with localised evidence of cellulitis. The skin becomes tense and shiny gradually darkening to a dusky blue, with blistering. Necrosis of subcutaneous tissues results in a thin, watery, foul-smelling fluid referred to as "dishwater pus". Eventually with thrombosis of skin nutrient arteries areas of necrosis form, later developing into frank gangrene with generalised signs of systemic toxicity leading to septic emboli or septicaemic shock. The diagnosis should be suspected when a patient's condition deteriorates rapidly after developing a soft tissue infection. Radiologic evidence of gas in the soft tissues and in the fascial planes may support the diagnosis and CT scanning may also prove helpful. The definitive diagnosis is made at operation when the ability to pass a blunt instrument between the subcutaneous layer and the underlying muscle without resistance is said to be pathognomonic. Frozen section biopsy at operation may aid diagnosis and when combined with appropriate treatment has reduced mortality from 72·7% to 12·5%[8] in one series.

Aggressive treatment must be instigated early as the survival rate is inversely proportional to length of delay. Radical débridement and drainage of the affected tissues with adequate treatment of the underlying cause are required. High dose parenteral antibiotic treatment is necessary, penicillin G being the most appropriate for group A Streptococcal infection,[8, 11] with metronidazole being a suitable agent for use against anaerobic organisms; delay beyond seven days in instigating treatment nearly always proves fatal.[8]

The first case reported confirms the poor prognosis associated with perforated colonic carcinoma requiring emergency surgery, and illustrates one of the recognised routes available for spread of infection from the abdomen to the thigh through the sacrosciatic notch. It is unusual in that the sigmoid colonic perforation occurred in a relatively young patient causing infection and necrotising fasciitis in the right thigh. The second case also highlights this unusual complication of colonic perforation. Thigh infection should be suspected in patients who present with symptoms and signs referred to the lower back and hip in whom the general physical condition suggests more serious underlying pathology. In such patients an urgent barium enema may be the most appropriate form of investigation. Where signs of localised sepsis exist in the thigh, immediate exploration is indicated and if communication with the pelvis is identified laparotomy should be undertaken concurrently so that the precipitating cause can be adequately treated, by colonic resection, drainage of pelvic or intra-abdominal abscess, and diversion of the faecal stream.

We would like to thank Miss Andrea McKibbin for typing this manuscript and Proefssor T G Parks for his assistance in its preparation.

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Case report

DIDMOAD syndrome: a family with three affected siblings

A Varghese, B A Sims

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In 1938 Wolfram reported the occurrence of diabetes mellitus and optic atrophy in four of eight sibs.[1] Over 100 similar cases have since been reported and several other clinical features have been described.[2, 3, 4] The genetic disorder is commonly known as DIDMOAD syndrome, the mnemonic for Diabetes Insipidus, Diabetes Mellitus, Optic Atrophy and Deafness. This report describes three siblings with this syndrome in a family of ten born to healthy non-consanguineous parents. The family has been briefly referenced in McKusick's catalogue of Mendelian inheritance in man.[5]

CASE 1 (MG). A female born in 1959, presented with symptoms of diabetes mellitus at the age of eight. At that time she had diminished vision (N/34), deafness, and was considered to be educationally subnormal although attending a school for the deaf and blind. Ophthalmological examination revealed rotary nystagmus, a left convergent squint, early cortical cataracts and bilateral primary optic atrophy. She was treated with insulin, and during the next seven years she had frequent hospital admissions with hypo- or hyperglycaemic states. The co-existence of diabetes insipidus became apparent in 1974 at age 15, and polyuria was controlled with oral chlorpropamide. The same year she had to be admitted for long term care in a hospital for special care, due to behavioural problems. In 1975 she aspirated while eating, and required intensive resuscitation with artificial ventilation for ten days. While unconscious her serum osmolality remained normal without chlorpropamide, but on regaining consciousness polydipsia and polyuria recurred, the urine osmolality fell to 230 mosm/l and serum osmolality rose to 316 mosm/l. On recommencing chlorpropamide the serum osmolality improved to 304 mosm/l and urine osmolality to 762 mosm/l. Hypertonic saline infusion test was unsuccessful due to poor patient co-operation. Her other abnormalities included high tone deafness, bilateral hydronephrosis and hydroureters and incomplete emptying of the bladder. At the age of 19 she developed grand mal seizures. EEG showed non-specific abnormalities. In 1982 she aspirated again while eating and died.

Waveney Hospital, Ballymena, Co Antrim, Northern Ireland.
A Varghese, MB, MRCP, Senior Registrar.
B A Sims, MD, FRCP, Consultant Physician.
Correspondence to Dr Sims.

At autopsy the macroscopic abnormalities were pulmonary congestion and oedema, hypoplastic aorta, bilateral hydroureters, minimal hydronephrosis, scarring of both kidneys suggestive of pyelonephritis and atrophic optic nerves. Microscopically, the lung changes were consistent with asphyxiation and early aspiration pneumonia. The pancreatic acinar pattern was well maintained, but islets were not readily seen, and those present were small. The kidneys showed chronic pyelonephritis with marked chronic inflammatory cells within the interstitium. Both optic nerves showed bilateral atrophy. Sections from the cerebral cortex and brain stem showed some oedema consistent with asphyxia.

CASE 2 (VG). A female born in 1962, developed diabetes mellitus when 5 years old. Diabetes insipidus was diagnosed in 1976 aged 14. Impairment of vision and hearing were noted early in life and like her sister, she attended a school for the deaf and blind. In 1975 she had been noted to have a large bladder, and intravenous urography demonstrated bilateral hydronephrosis, hydroureters and dilatation of the bladder. A micturating cystogram showed impaired bladder emptying but no ureteric reflux suggesting abnormal neurological control of bladder function. She attended the diabetic clinic at the Waveney Hospital, with occasional hospital admissions for urinary infections or poor diabetic control.

In 1988 aged 26 she was admitted after a fall at home, and subsequently vomited and aspirated, and was transferred to an intensive care unit for ventilation. She gradually recovered from aspiration pneumonia in the left lower lobe, but had impairment of swallowing on occasions necessitating tracheostomy to protect the airway. Her swallowing gradually improved and the tracheostomy healed. Four months later she was re-admitted with poor diabetic control, associated with aspiration pneumonia in the right lower lobe. She was again transferred to the intensive care unit for assisted ventilation, where she slowly recovered. To prevent further aspirations epiglotti-pexy was performed, feeding being maintained with a nasogastric tube as she was unable to swallow. She suffered recurrent cyanotic episodes, in one of which she died in January 1990. Permission for autopsy was refused.

CASE 3 (DG). A male was born in 1966, of average intelligence. He has had epilepsy since 1981; diabetes mellitus onset in 1980 aged 13, which is reasonably controlled on once-daily insulin; and diabetes insipidus onset in 1980 aged 14, controlled on desmopressin. Visual acuity is 6/24 in both eyes and he has perceptual deafness requiring a hearing aid.

HLA typing of VG showed HLA – A38, A28, B44, B63. Typing of DG showed HLA – A1, A28, B8, B44, DR3, DR5. Typing was not possible for MG.

DISCUSSION

The family described is unusual in that each of the three affected members had all the major features of the syndrome (Table). Epilepsy, found in two of our patients, is not a recognised feature although EEG abnormalities have been previously reported.[6] Only three previous autopsies have been reported, the gross findings being similar to our Case 1 except for the presence of a hypoplastic aorta.[7] The main cause of death in Cases 1 and 2 was failure of brain stem function leading to aspiration pneumonia, and in Case 2 to loss of respiratory control. Axonal

TABLE

Age of onset of the features of the DIDMOAD syndrome

Feature	*Age of onset*		
	Case 1 (MG)	Case 2 (VG)	Case 3 (DG)
Diabetes mellitus	8	13	14
Diabetes insipidus	15	17	14
Deafness	14	14	17
Optic atrophy	8	14	14
Enlarged blindspot	NC	NC	14
Hydroureter	16	17	17
Atonic bladder	16	A	A
Low intelligence	8	17	N
Behavioural problems	18	17	A
Epilepsy	19	A	16
Colour blindness	NC	NC	14
Hyperalaninuria	A	A	14
Treatment of diabetes insipidus			
Chlorpropamide only	15	17	NT
Vasopressin only	NT	NT	14
Vasopressin + Chlorpropamide	NT	22	NT

NC = Not co-operative, NT = Not tried, A = Absent, N = Normal.

degeneration and demyelination without gliosis has been found in the pons in previous post-mortem examination.[7]

One third of patients with the DIDMOAD syndrome have had diabetes insipidus either at the time of presentation or subsequently. In all cases the polyuria could be partially or wholly controlled by exogenous vasopressin. This response to exogenous vasopressin suggests that the primary pathology is in the neurohypophysial system. Nevertheless, in our patients chlorpropamide had been effective in controlling the diabetes insipidus particularly in its early phase, the beneficial effect of this drug probably being due to potentiation of the action of reduced levels of endogenous vasopressin on the renal tubules.

Cremers et al observed that diabetes mellitus was the presenting symptom in 78% of cases, the age of onset ranging from two to 34 years.[3] The course of the diabetes mellitus is not thought to be different from insulin dependent diabetes. The presence of optic atrophy in a patient with insulin dependent diabetes of short duration should alert the clinician to the possibility of the DIDMOAD syndrome:[8] the optic atrophy is progressive and eventually leads to blindness irrespective of diabetic control. Audiometric abnormalities have been reported in 60% of patients with high tone nerve deafness as the characteristic feature. Dilatation of the efferent urinary tract and bladder atony have frequently been found, these changes being predominantly due to the increased flow of urine, although autonomic dysfunction of the bladder may have been a factor in Case 2.

The syndrome is autosomal recessive. The male/female ratio in 89 cases is 46:43 and in a fifth of all reported cases there is parental consanguinity. HLA DR2 which is rare in insulin dependent diabetes has been frequently reported in the DIDMOAD syndrome, but as yet there is no consistent haplotype.[9, 10] It is over fifty years since the syndrome was first described, but the pathological processes involving the pancreas, neurohypophyseal system, the optic and auditory nerves remain obscure. Perhaps with the developments of DNA technology, it may be possible to obtain a clearer understanding of the pathogenesis at a molecular level of this disabling genetic disorder.

We wish to pay tribute to the late Dr R J Skelly who first diagnosed the syndrome in this family. We are grateful to Dr D Hadden, Professor N C Nevin and Professor D Archer and their staff for their contribution to the diagnosis and management of the children in the family. Also to Professor Ingrid Allen for her helpful comments regarding the postmortem findings. More detailed reports on the neurohypophyseal histology will be available for Case 1.

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Case report

Acute acalculous cholecystitis in intensive care

M Gomaa, A M Chisakuta, J P Alexander

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Acute acalculous cholecystitis is increasingly being recognised as a complication of critical illness. The disease usually develops on a background of prolonged illness following multiple trauma, extensive burns, severe sepsis, major surgery or drug overdosage. The clinical picture is virtually indistinguishable from acute obstructive cholecystitis and the diagnosis is often made at laparotomy.[1] We report three cases which occurred over a nine-year period in a six bedded intensive care unit.

CASE 1. A 39-year-old male with longstanding ankylosing spondylitis underwent manipulative spinal osteotomy to correct spinal deformity. Four days later he became profoundly shocked, with respiratory and renal failure. Initial laparotomy revealed a large perforated gastric ulcer. A long complicated illness ensued, with prolonged respiratory failure necessitating artificial ventilation via a tracheostomy, inotropic support, and haemodialysis. Another laparotomy was performed on the seventeenth day to drain a subphrenic abscess; a distended gangrenous gallbladder was found and removed. Four months after the start of his illness, a third laparotomy was done because of persistent vomiting. There were widespread adhesions and infected bile escaped during mobilisation of the right colonic flexure, which was adherent to the remains of the gallbladder bed. *Candida albicans* was cultured from a specimen of bile, and the same organism was isolated from blood cultures. This man was nearly six months in intensive care, and we were later able to identify a deficiency of the trace element selenium.[2]

CASE 2. A 22-year-old female developed acute renal failure secondary to postoperative hypovolaemia and hypotension following small-bowel resection for adhesions and gangrenous bowel. She was transferred to this hospital for dialysis. A second laparotomy, one week after the first, revealed further necrotic bowel which was resected. There were about two litres of green fluid in the abdominal cavity and the gallbladder was noted to be stained a deep green colour but otherwise seemed healthy. She remained acutely ill after this operation with paralytic ileus, large naso-gastric aspirates, tachycardia and hypertension. She

Intensive Care Unit, Belfast City Hospital, Belfast BT9 7AB.
M Gomaa, MD, BSc, Registrar in Anaesthetics.
A M Chisakuta, BSc, MB, ChB, Registrar in Anaesthetics.
J P Alexander, FRCPI, FFARCS, Consultant Anaesthetist.
Correspondence to Dr Alexander.

developed tenderness over the gallbladder which was removed at a third laparotomy one week later, and found to be still stained dark green, slightly distended and flabby. Some adhesions were mobilised during this operation, and she subsequently made a slow but satisfactory recovery.

CASE 3. A 42-year-old male suffered very severe chest and shoulder trauma during a road traffic accident. There was a marked flail segment and a major degree of surgical emphysema which extended as far as the pubis. He required prolonged ventilatory support. On the twelfth day he became critically ill with refractory hypotension, disseminated intravascular coagulopathy and severe jaundice. He gave every appearance of septicaemia although no organism was isolated. An ultrasound scan showed biliary ducts and gallbladder of normal calibre. One week later CT scan of chest and abdomen was normal. After a further week the patient was able to indicate that he had abdominal pain. His white cell count rose from $26 \times 10^9/1$ to $60 \times 10^9/1$. Repeat ultrasound scan suggested cholecystitis with a dilated tender gallbladder. This was confirmed at laparotomy, and a tense gallbladder with a patchy gangrenous wall was removed. Eight days later he required wound exploration for evacuation of a haematoma but otherwise he made a gradual recovery.

DISCUSSION

Acute acalculous cholecystitis accounts for up to 8% of acute cholecystitis.[1] It is not a new disease, the first recorded case being in 1844.[3] Sporadic reports appeared over the next century, and there has been a dramatic and linear increase in incidence since 1950. Such increase would seem to coincide with the advent of intensive care. The incidence of the disease has been estimated at between 0·5–1·6% in critically ill patients.[4] In our series we estimated that 383 patients were at risk, having stayed in intensive care for more than seven days, giving an incidence of 0·8%.

Our patients suffered from many of the risk factors known to be associated with acute acalculous cholecystitis. These have been listed as shock, septicaemia, prolonged fasting, prolonged ventilatory support, use of total parenteral nutrition, dehydration, prolonged infusion of opiate drugs, and multiple blood transfusions.[4] Many of those risk factors are known to diminish gallbladder function. Positive pressure ventilation has been shown to increase pressure within the common bile duct, while the physiological effects of prolonged starvation and opiate drugs are well recognised inhibitors of gallbladder contraction. Inspissation of bile and perhaps obstruction of the cystic duct predispose to some degree of gallbladder ischaemia and the risk of secondary infection.[5] Orlando and colleagues[3] discussed the concept of gallbladder perfusion pressure (mean arterial pressure minus intraluminal pressure) in the development of the syndrome. Mean arterial pressure is decreased by hypotension and the use of vaso-active drugs, while intraluminal pressure is increased by biliary stasis, inspissated bile and oedema of the ampulla. A decrease in gallbladder perfusion pressure would lead to ischaemia and necrosis, the causes of which can be considered to be multifactorial. The epithelial damage that occurs during low-flow states thus shares a common cause with stress ulceration, renal tubular necrosis and haemorrhagic enteritis, and can be considered to be yet another manifestation of multiple organ failure. In one small study, 45% of 25 critically ill patients had bile sludge or a thickened gallbladder

wall demonstrated by ultrasonography, although none of the patients required operation.[6] Another report hinted at an association between acute gallbladder disease and multiple organ failure following major long bone trauma, but this has not been confirmed.[7]

The role of total parenteral nutrition in the aetiology of the disease is difficult to understand. Presumably the majority of patients would not survive long enough to develop acute gallbladder disease without intravenous feeding. However, Roslyn and colleagues[8] have documented a very high incidence of gallbladder disease (45%) in a series of patients with short bowel syndrome or inflammatory bowel disease who received total parenteral nutrition for a period of two months or more. The average period of intravenous feeding in their patients was 18 weeks, and the majority of patients with gallbladder disease had gall stones. Other workers[9] have compared the histological appearance of intense vascular injury in the muscularis and serosa of the gallbladder to that which can be produced in some animals experimentally following activation of factor X11 (Hageman factor) dependent pathways by intravenous injection of bacterial endotoxins.

Pathological examination of the diseased gallbladders in our cases showed the classical appearance[1] of enlarged organs with thickened oedematous walls, marked cellular infiltration, and varying degrees of mucosal ulceration, necrosis and patchy thrombosis of vessels. Gangrenous areas showed complete destruction of the normal architecture. In none of our cases were bacteria or fungi seen microscopically or isolated on culture. An increased index of suspicion for this disease is required if the high mortality associated with late diagnosis and delayed treatment is to be avoided.[3] Serial ultrasound investigations in high-risk patients are of proven value, and an aggressive surgical philosophy aimed at early laparotomy where intra-abdominal sepsis is suspected is recommended.[4]

We are grateful to all those medical, nursing and paramedical staff, too numerous to name, who through their enthusiastic and devoted care enabled these patients to survive their critical illnesses.

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Case report

Skin rash associated with accidental addition of excess aluminium sulphate to the water supply

V K Tohani, R McCann, M Fox, R Fulton

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INTRODUCTION

The fitness of water supplies for public consumption may be assured by minimal treatment where high purity sources are available. Aluminium sulphate is used in the coagulation process forming a floc which acts as a filter for the removal of finer particles. The presence of a high concentration of aluminium sulphate in the water supply lowers the pH of the water and may result in the release of copper, lead, nickel and zinc from plumbing systems.

Case History. A 40-year-old healthy Tyrone female took a bath in the afternoon of 9th October 1988 at her home in Carrickmore. Before getting into the bath she noticed that the water had a "bluish" tint. Immediately after her bath she developed a diffuse pale macular rash similar to that of rubella which was confined to the part of her body which had been submerged. The rash was itchy, not associated with systemic upset, and persisted for four weeks.

She was patch tested to the following aqueous solutions at the recommended concentrations: 2% aluminium sulphate, 1% lead acetate, 5% copper sulphate and 5% zinc sulphate. There was no immediate skin reaction after 20 minutes, and no delayed reaction after two and four days. However, further patch testing with nickel and cobalt revealed that she was very strongly allergic to both of these metals. She had been known to have a skin sensitivity to nickel, such as found in cheap jewellery.

Public Health investigations. Just before midnight on 8th October the Chief Officer of the Western Water Division for the Department of the Environment had contacted the Chief Administrative Medical Officer of the Western Health and Social Services Board informing him that an excessive amount of aluminium sulphate had been added to the water supply due to the malfunctioning of

Western Health and Social Services Board, 15 Gransha Park, Clooney Road, Londonderry, Northern Ireland BT47 1TG.

V K Tohani, MFCM, Consultant in Public Health Medicine.

R McCann, MFPHM, Senior Registrar in Public Health Medicine.

M Fox, MB, BCh, General Practitioner.

R Fulton, MRCP, Consultant Dermatologist, Altnagelvin Area Hospital.

equipment. Notification to the public in Carrickmore was made through public notices, radio and subsequent press announcements, asking them to refrain from using water within the next 12 hours as it was contaminated with aluminium sulphate. Various samples at the point of delivery were taken for chemical analysis. The EEC maximum admissible concentration for aluminium in water for drinking is 0·2 mg/l.[1] Levels ranging from 0·05 mg/l in Garvaghey to 1·8 mg/l in Carrickmore were recorded on 10th October. By 7th November the levels had fallen to between 0·2 – 0·6 mg/l. At the time of the incident the pH in water supplied around the Carrickmore area had dropped to 5·0 for a short period[2] before rising to within the acceptable range of 5·5 – 9·5. Water samples taken from the patient's house on 9th December showed a pH of 9·0 to 9·2, nickel concentration of $<0·02$ mg/l and copper concentration of 0·03 to 0·07 mg/l.

DISCUSSION

Excessive amounts of aluminium sulphate had been added in the past to drinking water due to instrument failure[3]; in Carrickmore this fault was detected early so that amounts added were not very high. The low pH of the water may also have been associated with the release of metals from the plumbing system and the patient's rash may actually have been related to the presence of nickel in her bath water.

There is concern that in the long term aluminium in water may increase the risk of Alzheimer's disease, but present evidence is not sufficient to establish a causal relationship. Further epidemiological investigation is required but progress is slow as Alzheimer's disease may be misdiagnosed and under-reported, and exposure to aluminium in water is hard to determine accurately. Support for the hypothesis that aluminium in water is associated with the occurrence of Alzheimer's disease has come from a variety of sources.[4] Dialysis patients were found to be at risk from encephalopathy in areas with high concentrations of aluminium in water. Animal experiments have shown that injecting aluminium into the brain produces neurofibrillary tangles similar to those found in Alzheimer's disease.

Martyn et al carried out a survey of 88 country districts in England and Wales and found a 50% increased risk of Alzheimer's disease in those areas where aluminium concentration in water exceeded 0·11 mg/l compared to areas with a concentration under 0·01 mg/l.[5] Although the association between Alzheimer's disease and aluminium concentration was statistically significant, questions arose over the reliability of the data on the aluminium content of the water and the completeness of the ascertainment of frequency of Alzheimer's disease in the different areas.

In any future such incident, it would be wise to warn the public not to consume contaminated water, as well as not to bathe if they suffer from known allergy to metals.

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Case report

Microcystic adenoma of the pancreas

M K Heatley, D C McCrory, M D O'Hara

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Microcystic adenoma of the pancreas is a benign tumour mainly occurring in elderly females. It is usually encountered as an incidental finding at laparotomy or autopsy. We report a case which occurred in a 66-year-old female, which was identified radiologically before operation and which was associated with a serous cystadenoma of the ovary.

Case Report. A 66-year-old lady presented with back pain so severe that she had remained in bed for the preceding four months. A mass was palpable in the left hypochondrium. She had a macrocytic anaemia (Hb 11·1 g/dl MCV 111 fl) due to vitamin B_{12} deficiency. There was no hyperbilirubinaemia and the liver transaminase concentration in the blood was normal. A random plasma glucose was also normal. Ultrasound and CT scans of the abdomen revealed a cystic mass related to the tail of the pancreas and a cystic tumour of the left ovary. At laparotomy a large mass was identified in the tail of the pancreas, which was attached to the transverse colon by a few adhesions. When these adhesions were broken the mass shelled out easily. The presence of a left ovarian cyst was confirmed and this was also excised. She made an uneventful recovery and was discharged from hospital after three weeks. Her anaemia was treated with hydroxycobalamin injections and she remains well one year later.

The resected specimen from the pancreas weighed 783 g and measured 14 × 11 × 8 cm. On section its multicystic character was confirmed, the cysts measuring up to 0·5 cm diameter, with a stellate scar at its centre. The cysts were lined by flattened cuboidal epithelial cells. The periodic acid Schiff stain, with and without prior diastase digestion, confirmed the presence of large quantities of glycogen in the cytoplasm of these cells. No mucin was detected. Sections from the capsule of the lesion showed compressed ribbons of cells which on immunohistochemical study stained positively for insulin and glucagon confirming that they were compressed islets of Langerhans. These appearances were characteristic of a microcystic adenoma of pancreas. The ovarian lesion showed the typical histological appearances of a benign serous cystadenoma.

Department of Pathology, The Queen's University of Belfast, Belfast BT12 6BA.
M K Heatley, MB, BCh, MRCPath, Senior Registrar.
M D O'Hara, BSc, MB, FRCPath, Consultant Histopathologist.

Department of Surgery, The Queen's University of Belfast, Belfast BT12 6BA.
D C McCrory, FRCSI, Registrar.

Correspondence to Dr Heatley.

Review of the surgical pathology records at the Royal Victoria Hospital, Belfast, over a 50 year period between 1939 and 1988 revealed only three other microcystic adenomata. All occurred in females. (Table). In the same period 102 primary pancreatic adenocarcinomata and 27 tumours of islet cell origin were diagnosed, suggesting that microcystic adenoma is an uncommon lesion.

TABLE

Clinical details of four patients with microcystic adenoma of the pancreas

Patient	*Sex/Age*	*Presentation*	*Site/ Maximum dimension*	*Diabetes*	*Other tumour*	*Length of follow-up/ Outcome*
1	F (44)	Incidental finding	Body 3 cm	No	Adrenal cortical adenoma	6 years Alive
2	F (48)	Obstructive jaundice	Head 12 cm	No	None	5 years Alive
3	F (75)	Incidental finding	Head Not stated	Yes	None	18 years Alive
4 (present case)	F (66)	Back pain	Tail 14 cm	No	Ovarian cystadenoma	1 year Alive

DISCUSSION

The majority of cystic lesions of the pancreas are of inflammatory or developmental origin and only 10–15% represent true neoplasms.[1] Neoplastic cysts may be classified on the basis of their epithelial lining into mucinous or serous cystadenomas.[2] Serous cystadenomas are also known by the more popular term microcystic adenoma of the pancreas. In five recent series[2-6] describing a total of 70 cases, microcystic adenomata were found to occur most commonly in females (F:M = 51:19) with a mean age of 67 years (range 37–89 years).

Microcystic adenomata most commonly occur in the pancreatic head but may also be encountered in the body or tail. Symptoms often reflect the site of the primary lesion. Those located in the pancreatic body and tail may present, as in this case, with non-specific symptoms such as backache and loin pain. Lesions situated in the pancreatic head can obstruct the external biliary tract, giving rise to obstructive jaundice[6] and ascending cholangitis.[2] Acute pancreatitis which might result if the pancreatic duct were obstructed by the tumour has not been described. Local pressure on the duodenum may induce mucosal ulceration resulting in gastrointestinal bleeding which can be fatal.[2] Other presenting complaints include weight loss, nausea and vomiting. Some cases are an incidental finding at laparotomy or at autopsy[2] or are identified on straight abdominal X-ray.

Microcystic adenomata are well defined lesions, since compression of adjacent pancreatic tissue results in the formation of a pseudo-capsule in which islet cells may be identified. The pseudo-capsule presents a line of surgical cleavage which

enables the tumour, especially if located in the tail of the pancreas, to be shelled out. A Whipple's operation may be required to ensure complete excision of a tumour located in the pancreatic head. In the series reviewed, patients were followed up for between three days and 25 years. There were six postoperative deaths; a few patients died due to the local effects of the microcystic adenoma.[2] A further 19 patients died due to unrelated disease. Malignant transformation was not described in any of these cases.

In cases 1 and 4, tumours in organs other than the pancreas were identified. A review of the literature failed to reveal any previous case in which either an ovarian serous cystadenoma or an adrenal cortical adenoma occurred in association with a microcystic adenoma of the pancreas. A greater incidence of tumours in body organs other than the pancreas, and of diabetes mellitus[2, 3] have been recognised in patients with this condition, although these findings may simply reflect the age of the patient.

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Case report

Infective endocarditis due to ulcerative colitis

D P Nicholls, C F Stanford

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A recent report of infective endocarditis in Crohn's disease[1] prompted us to report this case of fatal endocarditis in a young girl with ulcerative colitis, not on immunosuppressive treatment.

CASE REPORT. A 15-year-old girl was admitted with a seven day history of unproductive cough, mild dyspnoea and more recent muscle pains, anorexia and vomiting after a tablet of aspirin. On the night of admission, she was found unconscious and fitting by her parents after visiting the toilet. A year previously she had been admitted with a four week history of hip pains, low grade pyrexia and an erythrocyte sedimentation rate of 96 mm/h. A diagnosis of Still's disease was considered but not proven, and her pains improved with prednisolone 15 mg on alternate days, having not responded to naproxen. Five months later she presented with a ten day history of bloody diarrhoea. Barium enema and sigmoidoscopy confirmed severe ulcerative panproctocolitis, and it was thought that her arthritis was related to this. An increase in the dose of prednisolone to 40 mg daily improved her bowel and joint symptoms but enteric-coated sulphasalazine 500 mg qds was not tolerated due to vomiting. Colectomy was considered but not carried out because of partial remission of symptoms, and she was able to discontinue prednisolone treatment. At the time of admission to our unit, her bowel and joint symptoms were moderate and had been stable for several months, and she had been able to return to school. She was taking oral iron supplements only, and no prednisolone for at least eight months. In particular, there had been no recent instrumentation or radiological examination.

On examination she was pale and thin, and looked unwell. She was mentally alert and apyrexial. There were no splinter haemorrhages. She had a tachycardia of 120 beats/min, blood pressure was 100/60 mmHg and there was no evidence of cardiac failure. A fourth heart sound was audible, and a soft systolic murmur at the left sternal edge, but no diastolic murmurs were heard. Her chest was clinically clear, and abdomen normal. No neurological abnormalities were detected.

Her condition remained stable during the first 12 hours of admission, but then she had two brief episodes of profound hypotension, peripheral circulatory failure and unconsciousness without fitting. To exclude a cardiac cause for her

Royal Victoria Hospital, Belfast BT12 6BA, Northern Ireland.
D P Nicholls, MD, MRCP, Consultant Physician.
C F Stanford, MD, FRCP, Consultant Physician.
Correspondence to Dr Nicholls.

symptoms, an echocardiogram was performed 18 hours after admission (see below). During the procedure she complained of nausea and dizziness, and was observed to have a sinus tachycardia rate 140 beats/min. At the end of the procedure she collapsed again, and the electrocardiogram showed asystole. Resuscitation was not successful.

INVESTIGATIONS

The haemoglobin was 11·3 g/dl, mean corpuscular volume 83 fl, and total white cell count $11 \cdot 5 \times 10^9/l$. The erythrocyte sedimentation rate was 100 mm/h. Urine analysis was normal. A biochemical profile was normal except for a creatine kinase level of 302 U/l (normal 30–140). The electrocardiogram showed sinus tachycardia, an inferior frontal plane axis and loss of R wave in the precordial leads V1 – 4. The chest X-ray showed patchy shadowing in mid and lower zones bilaterally. Blood cultures showed a scanty growth of *E. coli.*

The echocardiogram showed dilation of all four chambers, especially the left ventricle, with impaired systolic function (Fig 1a). Early closure of a normal mitral valve was also observed (Fig 1b), probably related to increased left ventricular end diastolic pressure. A large vegetation was seen on the non-coronary cusp of the aortic valve (Fig 1c). The cusps did not oppose and severe regurgitation was observed during pulsed wave Doppler examination from the left ventricular outflow tract (Fig 1d). The tricuspid valve also appeared thickened.

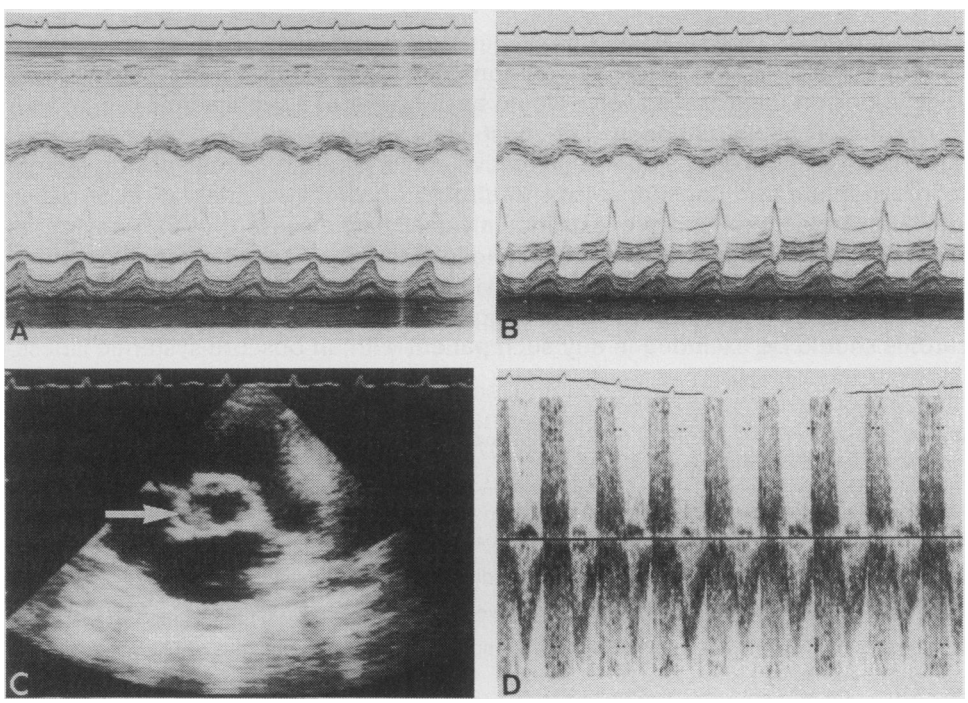

Figure. Echocardiographic examination showing (a) a dilated left ventricle with impaired systolic function, (b) marked premature closure of the mitral valve, (c) a vegetation on the non-coronary cusp of the aortic valve (arrowed) and (d) marked diastolic and lesser systolic turbulence in the left ventricular outflow tract.

Postmortem examination confirmed the echocardiographic findings. Large soft friable vegetations were found on the aortic and tricuspid valves, and a hole in the non-coronary cusp of the aortic valve. The entire large bowel was inflamed but no ulcers or perforations were found. The liver and spleen were congested. The cerebrospinal fluid was cloudy, with a protein content of 4·5 g/l (normal 0·15 – 0·45) and 1600 white cells/μl, mostly lymphocytes. Histological examination of the aortic valve showed mixed inflammatory and thrombotic tissue; no bacteria were demonstrated. Postmortem culture of the valve grew scanty growths of *E. coli, Proteus spp* and *Clostridium perfringens.*

DISCUSSION

Although aortic regurgitation may be associated with colitis and with seronegative arthritis, no diastolic murmurs had been detected in this patient at any stage, and the basic valve structure at necropsy appeared to be normal. The hole in the cusp did not have the appearance of a fresh tear, which could have been caused by resuscitation or by postmortem examination. The presence of severe regurgitation, as well as possibly an obstructive element due to the vegetation in view of the systolic turbulence noted on Doppler ultrasound (Fig 1d), had evidently caused left ventricular strain and dilation. With the increased end diastolic pressure and premature mitral valve closure (Fig 1b), tachyarrhythmias would be tolerated poorly and would produce a marked reduction in cardiac output. We suspect that this was the mechanism of syncope and eventual death in this case.

The macroscopic appearance of the vegetation would suggest an infective origin, although bacteria could not be demonstrated. In addition, the presence of vegetations on the tricuspid valve would be in favour of a septicaemic origin, with *E. coli* the probable pathogen. The most likely source would be the large bowel, but infective endocarditis due to ulcerative colitis is rare.[2, 3] Predisposing factors to infection are immunosuppressive treatment,[1] bowel instrumentation or radiological examination[2] and pre-existing valvular heart disease, but in many cases the cause of infection is not identified, and infection may occur in patients with no cardiac abnormalities.[4] The risk to individual patients with inflammatory bowel disease must be small, but we would suggest that the diagnosis of infective endocarditis should be excluded in any such patient with an obscure systemic illness.

We are grateful to Mrs C Anderson for her help, and to Dr N P S Campbell and Dr M M Khan for their help in interpretation of the echocardiogram.

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Case report

Postsplenectomy pneumococcal septicaemia resulting in gangrene of the extremities

A B Fogarty, J O Small, J Colville

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The enhanced susceptibility to certain infections following splenectomy has been increasingly recognised since the 1950's.[1] More recently the syndrome of overwhelming postsplenectomy infection (OPSI) has been defined.[2] This describes the clinical picture of an acute fulminant illness, associated with disseminated intravascular coagulation and shock, progressing rapidly to coma and death within a few hours of onset. We present a case of pneumococcal septicaemia occurring 25 years after splenectomy for trauma.

CASE REPORT. A 37-year-old male presented to a local hospital with a short history of nonspecific illness. He had been unwell for three days, feeling feverish with diarrhoea and shortness of breath. He gave a history of having had a splenectomy carried out when he was 13 years old following blunt abdominal trauma. He had not suffered any other serious illnesses.

On examination he was pyrexic with a tachycardia and a blood pressure of 105/65 mmHg. He had a generalised purpuric rash, and his hands and feet were cold and cyanosed. The white cell count was 30,000/μl and there was moderate elevation of plasma glucose and urea. Gram-positive diplococci were cultured from the peripheral blood and the diagnosis of pneumococcal septicaemia was later confirmed.

He was treated with intravenous benzylpenicillin, two mega units four hourly, and fluid and electrolyte support. Over the next few days he became hypotensive and his peripheral circulation remained shutdown. Disseminated intravascular coagulation was diagnosed and was treated with fresh plasma transfusion. He was also treated with dobutamine and naftidrofuryl oxalate. He developed gangrene of both feet and of all the fingers, also skin necrosis of the tip of the nose and upper lip.

His general condition nonetheless improved, and three weeks after the initial presentation he was transferred to this unit where amputations of both legs below the knees and of all the fingertips were carried out. The necrotic areas at the tip of

Department of Plastic and Reconstructive Surgery, The Ulster Hospital, Dundonald, Belfast BT16 0RH.
A B Fogarty, FRCS(Ed), FRCSI, Senior House Officer.
J O Small, FRCSI, Consultant Plastic Surgeon.
J Colville, FRCS(Ed), FRCSI, Consultant Plastic Surgeon.
Correspondence to Mr Fogarty.

his nose and lip demarcated and healed spontaneously. Pathological examination of the legs confirmed occlusion of the smaller blood vessels in keeping with disseminated intravascular coagulation.

DISCUSSION

The responsible organism for overwhelming postsplenectomy septicaemia is usually *streptococcus pneumoniae* but *meningococcus spp* and *haemophilus influenzae* are commonly implicated. The current literature suggests that the rate of overwhelming infection following splenectomy for trauma ranges from 0·5% to 2·5% after long-term follow up.[3] If splenectomy is performed in childhood however, the rate of overwhelming infection is significantly higher, with most cases occurring within two to three years of operation. Consequently there has been a move towards spleen-saving surgery following blunt abdominal trauma, especially in children. Non-operative management in conjunction with non-invasive investigation of splenic integrity is common practice. A useful classification of splenic injuries is given in the Table. In cases where laparotomy is undertaken, lesser degrees of splenic injury (types I – III)[4] can usually be treated by splenorrhaphy or partial resection, reserving splenectomy with autotransplantation for type IV injuries.

TABLE

Types of splenic injury

Type I	Incomplete parenchymal tear.
Type II	Parenchymal tear extending up to the hilus but not dividing it.
Type III	Complete parenchymal tear dividing the spleen into two fragments, each with an intact blood supply.
Type IV	Complete fragmentation with a torn hilar vessel.

The functional deficit in the asplenic patient appears to be partly a diminished filtration ability and partly lower levels of IgM and opsonization factors.[5] Unfortunately autotransplanted splenic tissue never fully regains the function of a normal spleen. It is generally accepted that patients who are asplenic should receive polyvalent pneumococcal vaccine.[6] The value of long-term chemoprophylaxis however has not been proven, but if appropriate, one should prescribe penicillin V 250 mg bd or amoxycillin (erythromycin if allergic to penicillin). Children under the age of four do not respond well to pneumococcal vaccine and should receive chemoprophylaxis until aged five. This patient did not require pneumococcal vaccination having survived a septicaemic episode and so he was commenced on penicillin V.

The patient described illustrates an atypical case of postsplenectomy sepsis. He did not have the full-blown picture of the overwhelming postsplenectomy infection syndrome, his clinical course being less severe although more protracted. The peripheral gangrene was most unusual and could possibly be explained on the basis of peripheral circulatory shut-down along with intravascular coagulation. There is little doubt that his illness was directly attributable to his asplenic state and this case serves as a reminder that the spleen can no longer be viewed as an expendable organ.

We thank Dr W J McIlwaine, Consultant Physician, Ards Hospital, for his permission to publish this case.

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Historical Review

Sir William Osler's Arab and other Middle Eastern contacts

Anand Date

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Although Sir William Osler died more than 70 years ago his life and writings continue to engender interest as manifest by the very active societies dedicated to his memory and the number of publications about him that continue to appear every year. The cause of this continuing admiration is difficult to explain, since, as has been pointed out, many of his now forgotten contemporaries were equally gifted clinicians and writers and made greater contributions to medical research.[1] Perhaps the reverence he still inspires is because his life, as described by his biographer Harvey Cushing, epitomises the ideal relationship between teacher and student, between physician and patient, between a doctor and his colleagues; and between men and books and libraries and societies and universities.

At this time, readers of the journal might be interested in Osler's contacts with a now much troubled area of the world. The first draft of this article was written, between alarms and anxieties, in the author's flat in Iraqi-occupied Kuwait. The writing gave much needed aequanimity. It was completed while with friends who provided shelter and succour in the United Kingdom after the author's escape from Kuwait.

CONTACT IN SPACE: AN EGYPTIAN HOLIDAY

In 1911, after a difficult winter, and probably in an effort to shake off a persistent respiratory infection precipitated by the chill of examination rooms, Osler travelled to Egypt with his wealthy brother Sir Edmund Boyd Osler. They met at Naples on February 4th and went by sea to Egypt.[2] The second week of February was spent in Cairo which they reached "in one of those sand storms, the air filled with a greyish dust which covers everything and is most irritating to eyes and tubes". While in Cairo he visited hospitals, the Khedival Library and Gizeh.[2] The party then went up river on board the S S Seti described in his letters as follows: "This boat is delightful". "Such a trip! . . . Everything arranged for our comfort and the dearest old dragoman who parades the deck in gorgeous attire with his string of 99 beads — each one representing an attribute of God!" "He knows everything and manages the boat like a first-class hotel".

"The Nile itself is fascinating, an endless panorama — on one side or the other the Arabian or the Libyan desert comes close to the river, often in great limestone ridges, . . . Yellow water, brown mud, green fields, and grey sand and rocks

Anand Date, MD, Professor of Pathology, Christian Medical College and Hospital, Vellore, India and Consultant Pathologist, Ministry of Public Health, Kuwait.

Address for correspondence: Dr Anand Date, Institute of Pathology, The Queen's University of Belfast, Grosvenor Road, Belfast BT12 6BL.

always in sight; and the poor devils dipping up the water in pails from one level to the other". Sometimes they "tied up to one of Cook's floating barge docks; squatted outside is a group of natives, and the Egyptian policeman (who is in evidence at each stopping place) is parading with an old Snider and a fine stock of cartridges in his belt. . . . " The journey from Cairo to "Assouan" and back took four and a half weeks with frequent stops including visits to the Hospital of the American Mission at Assiut and various antiquities, and on March 5th: "We are here at the first Cataract, across which is the great dam, a bit of work of which even the old Rameses II would have been proud".

The antiquities fascinated him. After visiting the tombs of Denderah: "Heavens what feeble pigmies we are! Even with steam, electricity and the Panama Canal . . . " After Luxor: "wonderfully impressive. No such monument of human effort exists as Karnak. It is simply staggering". "The great pyramid came up to my expectation . . . we saw it by the full moon".[3] And of medical interest: "I have just come from paying my respects to Dr Imhotep", the architect of the step pyramid and "the first physician with a distinct personality to stand out in the mists of antiquity".

His medical observations were incorporated into the new edition of his famous text-book. A few comments from his letters: "The country has one God — the sun; and two devils — dust and flies; the latter responsible I am sure for two-thirds of the disease. The ophthalmia is awful and one sees a great deal of blindness".

Regarding hookworm disease he writes: "They have not yet organised a crusade against the disease and it really seems hopeless as no one wears anything on the feet in the country, and the conditions about the villages could not be more favourable for its spread. At every landing-stage one can pick out the victims. Bilharzia is even worse — very common and more hopeless. The Hospital has a score or more of bladder cases and as many of the intestinal form".

His interest in books was not neglected: "I saw some great books in the Khedival Library . . . Korans superbly illuminated. The finer types have been guarded jealously from the infidel, and Moritz the librarian showed me examples of the finer forms that are not in any European libraries. Then he looked up a reference and said — 'You have in the Bodleian three volumes of a unique and most important 16th cent Arabic manuscript dealing with Egyptian antiquities. We have the other two volumes. Three of the five were taken from Egypt in the 17th century. We would give almost anything to get the others'. And then he showed me two of the most sumptuous Korans, about 3 ft in height, every page ablaze with gold, which he said they would offer in exchange. I have written . . . to get the curators to make the exchange, but it takes a University decree to part with a Bodley book!"

He has much to say about the people he met and their religion. "The Arabs are fine; our Reis, or pilot, is a direct descendant, I am sure, of Rameses II, judging from his face. After washing himself he spreads his prayer mat at the bow of the boat and says his prayers with the really beautiful somatic ritual of the Moslem". "Our dragoman is a fine old Arab full of humour. 'Me', he says, 'I have my Koran, my cold water, my cigarette and my home'". "We had a great treat yesterday afternoon. The Pasha of this district has two sons at Oxford. . . . We had tea in his house and then visited a Manual Training School for 100 boys, which he supports. In the evening he gave us a big dinner. I wish you could have seen us

start off on donkeys for the half mile to his house. It was hard work talking to him through an interpreter, but he was most interesting — a great tall Arab of very distinguished appearance. A weird procession left his house at 11 pm — all of us in evening dress, which seemed to make the donkeys very frisky. Three lantern men, a group of donkey men, two big Arabs with rifles, and following us a group of men carrying sheep — one alive! chickens, fruit, vegetables, eggs, etc, to stock our larder". "The old Pasha, by the way, is a very holy man and has been to Mecca where he keeps two lamps perpetually burning and tended by two eunuchs. He is holy enough to do the early morning prayer from 4 to 6 am with some 2000 sentences from the Koran".

"The Musselman at prayer is the most impressive thing I have yet seen. 'Tis the secret of the success of the most successful religion if one judges by numbers. To see a great stalwart fellow stop his work at the call from some distant mosque and go through the impressive ritual of his prayers, and when we read in Lane the beautiful words of that prayer — the feeling comes of the intense realism of their faith and its magnificent tribute to the majesty and immanence of the one God".[3] His only reservation was on the position of women.

In Cairo again, he writes: "I spent a couple of hours yesterday with the chancellor of this ancient university (10th cent). The teaching is all in the open — and all on the Koran and its commentators. A little geography, law, etc. There are 12,000 students from all parts of the Moslem world. Students stay 1, 10 and even 20 years. It takes a life-course to know the Koran. An extraordinary religion and with great potency". At a more general level; "I got a splendid answer from the Sphinx in front of whom I stood just at sunset in a splendid glow of light. And as I sat on the sand and gazed and wondered and wondered — what do you suppose peeped over the very tip in full radiance? The evening star, symbol of Hope and Love! It really startled me — but was it not a good answer to the riddle of existence?"[3]

A final comment on his Egyptian journey. "I have never had such an enchanting trip".

CONTACTS IN TIME: BIBLIOGRAPHY AND HISTORY

Osler did not revisit the Arab world, but contacts at an intellectual level continued, through his passion for collecting books and his interest in the history of medicine. He began buying books early on in his professional career; this increased after he came to Oxford and he spent a significant percentage of his earnings on this pursuit.[4,5] In 1912 he decided that his library should be housed in McGill University in Montreal, and that it should consist of books of historical importance in the evolution of medicine and books whose authors were of special interest to physicians.[6] It contains many items of interest on the history of Arabic medicine. By July 1914 he had decided to prepare an extended catalogue of his collection and though he began work on this it was left to others to complete, many years after his death. The classification he proposed was adhered to and his comments on the items, where available, were included.[7,8] The catalogue which is distinguished from the library itself by its Latin title: Bibliotheca Osleriana has become a classic and has been described as "perhaps the most unusual and rewarding catalogue that exists . . . a bible and a bedside book to hundreds of medical librarians, historians and bibliophiles".[9] Osler divided the collection into eight sections: Bibliotheca Prima, a chronological bio-bibliographical account of the evolution of science, including medicine, illustrated by a small number

of works, the essential literature grouped about the men of the first rank. The index lists 58 items in this section related to Arabian medicine. Bibliotheca Secunda, the largest section, includes works of men who have made notable contributions, but not of the first importance. This contains 37 items of Arab interest. Bibliotheca Litteraria, which groups literary works by medical men and books dealing in a general way with doctors and the profession, has three items relevant to Arab medicine. Thirty-nine other items of Arabic interest are in the remaining sections entitled: Historica, Biographica, Bibliographica — whose titles are self explanatory — Incunabula which contains books printed before 1501, and a final section of Manuscripts.

A few months after his return from Egypt, Osler was invited by the President of Yale University to deliver a series of lectures on the Silliman Foundation.[2] Though primarily religious, the terms of the Foundation were wide enough to allow Osler to choose an historical topic — The Evolution of Modern Medicine, which he later described as "semi-popular and represents a sort of aeroplane flight through the centuries". Busy preparing the lectures, the next year finds him writing: "I have been deep in all sorts of out of the professional reading for these lectures trying to get in touch with men and times and places in our history. 'Tis not easy but the personal interest in individuals helps over the dull periods". His biographer points out that "His interest in the early medical incunabula had been a by-path followed in the preparation of his Silliman Lectures to give him 'a mental picture of the professors and practice of the time, from the characters of the books they thought it worth while to have printed'".[2] Osler had a "Deuce of a job getting these lectures ready" and they were finally given only in April 1913. The galley proofs of the lectures arrived from the Yale press later that year, but he was reluctant to have them published and in the next year: "I have bought off the Yale book by returning my honorarium. I was doubtful about them. I suppose I have got critical — possibly hyper-critical! the deeper I get into medical history".[2]

"The Evolution of Modern Medicine" appeared in book form eight years after the lectures were delivered, and after Osler's death. The section on Arabian medicine runs for 14 pages, and tells how the scientific knowledge of Greeks and Romans was preserved and nurtured by the Arabs during the Middle Ages, when it was lost in Europe; and of its return to the West. Earlier, Osler had written: "Once only in modern times has a tropical people, reaching a high grade of civilization, spread far and wide, in the magic outburst with which the Arabians shook the very foundations of Christianity".[10] In the Silliman Lectures this seventh century tide is described as follows: " . . . the Crescent had swept from Arabia through the Eastern Empire, over Egypt, North Africa and over Spain . . . " the Arabs were " . . . deeply appreciative of all that was best in Graeco-Roman civilization and nothing more than of its sciences. The cultivation of medicine was encouraged by the Arabs in a very special way".[11]

Osler tells how "close upon the crowd of translators who introduced the learning of Greece to the Arabians came original observers of the first rank, . . . Rhazes . . . With a true Hippocratic spirit he made many careful observations on disease, and to him we owe the first accurate account of smallpox, which he differentiated from measles. . . . He was a man of strong powers of observation, good sense and excellent judgement. His works were very popular, particularly the gigantic "Continens", one of the bulkiest of incunabula. . . . It is an encyclopaedia filled with extracts from the Greek and other writers, interspersed with memoranda of

his own experiences. His "Almansor" was a very popular text-book, and one of the first to be printed".[11]

"The first of the Arabians, known throughout the Middle Ages as the Prince, the rival indeed of Galen, was the Persian Ibn Sina, better known as Avicenna, one of the greatest names in the history of medicine. Born about 980 AD in the province of Khorasan, near Bokhara" according to his autobiography "He could repeat the Koran by heart when ten years old, and at twelve he had disputed in law and in logic. So that he found medicine was an easy subject, not hard and thorny like mathematics and metaphysics! . . . He was a voluminous writer to whom scores of books are attributed, and he is the author of the most famous medical text-book ever written. It is safe to say that the "Canon" was a medical bible for a longer period than any other work". "The Western Caliphate produced physicians and philosophers almost as brilliant as those of the East . . . the most famous of the professors were Averroes, Albucasis and Avenzoar . . . Averroes, called in the Middle Ages "the soul of Aristotle" or "the Commentator", is better known today among philosophers than physicians".[11]

The section ends with a discussion of how Graeco-Arabic learning passed into Europe through the efforts of translators, particularly those in southern Italy and Spain, who produced Latin translations of an extraordinary number of Arabic works. "Many of the translators of the period were Jews, and many of the works were translated from Hebrew into Latin. For years Arabic had been the learned language of the Jews, and in a large measure it was through them that the Arabic knowledge and the translations passed into South and Central Europe".[11]

The works of the early and later translators and other contributors to Arabic medical science are well represented in Osler's collection. Those found in the Bibliotheca Prima are mainly books by or about the three major figures of Arabic medicine: Rhazes (Ar Razi), Avicenna (Ibn Sina) and Averroes (Ibn Rushd). A section of the Bibliotheca Prima is labelled "The Arabians"[12] and a closer look at this gives us an insight into Osler's very personal method of organising his collection. It begins with "The Holy Qur-an" with Arabic text and English translation; a German work on Medicine in the Koran and two recent histories of Arabian medicine. Next comes the Rhazes collection which includes an Arabic manuscript of al-Hawi (the "Continens" in Latin) written in the 15th century; an 18th century Arabic manuscript of Rhazes' Kitab al Kunnar or Al-Fakhir (Splendid) on the whole practice of medicine; 15th century Latin translations of his summary of Greek medicine dedicated to the Abbasid Caliph Al Mansur and called Kitab al-Mansuri (Liber Almansorem, in Latin). Also 18th century and later translations of his treatises on smallpox, measles and urinary calculi; and finally a modern biography of Rhazes.

Avicenna's great work on medicine the Qanun ("Canon" in Latin) is represented by a 17th century Arabic manuscript of all five books of the Canon; two 15th century Arabic manuscripts of Book I and a 17th century Arabic manuscript of Book IV; also 15th, 16th and 17th century Latin translations of the above. A 14th century Arabic manuscript on logic; a Latin manuscript written in the 14th century translating a lost Arabic work on alchemy, and printed versions of this. Miscellaneous items including modern biographies are also included. Two 15th century Latin books translating the Colliget (the Latin form of Kittab Al Kulliyyat) of Averroes and a 15th century book of Averroes' commentary on Aristotle, comprise the Averroes collection together with two modern works.

The usual source of Osler's books were from sales, catalogues and second-hand book shops.[5] A study by Wells, of invoices of books bought by Osler suggests that the highest price paid for a single item was £40 for an extremely rare edition of Rhazes' Liber nonus ad Almansorem which he left to the British Museum.[4] He got some good bargains at sales, for example that at Sotheby's of George Dunn's collection of manuscripts where he purchased an important Avicenna manuscript for six guineas and an Averroes first edition 1482 at £23. A note added to this last item by Osler shows the care that went into classifying his collection: "I hesitated a long time whether or not to put Averroes in Bibliotheca Prima; I have done so less on medical than on general grounds — 1. Because the history of the profession offers no parallel to the influence he exercised for more than 400 years on human thought. 2. He was the great heretic. 3. He was the "great commentator" on Aristotle and to his writings scholars still turn for the interpretation of dark passages. . . . 4. He blazed a trail seemingly back to Aristotle, but actually leading forwards to Nature".[12]

Osler was in the habit of adding such notes and inserting letters into his books. Others of interest in this section are letters from Dr M Sa'eed and Dr A R Neligan of Teheran through whom various Arabic manuscripts had been purchased. We will meet these two again. Another of Osler's hand-written notes: "Aug. 7, 1915. Dr Neligan, physician to the British embassy, Teheran, told me to-day that he had a consultation on a case of fever with a native physician who quoted Avicenna and said he did not think the case was one of typhoid as it did not correspond with the symptoms laid down in the Canon".[12]

Osler did not of course know Arabic or consider himself an expert on the history of Arabic medicine. When Dr J C Comrie, the lecturer on the History of Medicine in the University of Edinburgh was proposing to edit a series of medical biographies Osler agreed to write those on Sydenham and Boerhaave, and suggested other contributors. But he writes: "I don't know whom to suggest for Greeks and Arabians. Save Browne of Cambridge, I don't believe we have an Arabian scholar in the profession — it is time we tried to breed one". Cushing describes his efforts to do this.[2]

SPACE AND TIME: A FRIEND AND A TOMB

In December 1910 when Osler was laid up with bronchitis Dr Cowley of the Bodleian told him of an Arabic manuscript translation of Dioscorides.[2] Osler replies: " . . . I would like to see the MS. — but I am in bed, with a mild bronchitis. Could you send it to me by my fraülein and say if you think it is a good example of an Arabic MS, . . . " Cowley replied: The MS is a very good specimen of Arabic writing — especially Vol I, but the pictures make it specially valuable. The Arabs did not run to such things much. The portrait of Dioscorides himself has been partly erased by a pious owner (as being idolatrous) and then restored, with the halo turned into a turban — so typical of modern progress! . . . I am very sorry to hear that you are laid up — but I don't wonder. I hope the sight of your ancient predecessor will really do you good. Will you let me have him back in the morning?" The manuscript was returned to Persia and led Osler into correspondence with Dr Sa'eed, who became his great admirer. Through Sa'eed the important Dioscorides manuscript (written in 1239 AD, the earliest known complete medical manuscript) and the Al-Ghafiki manuscript were purchased in 1912. He also obtained for Osler many Arabic manuscripts of Rhazes and Avicenna, all at prices under £15.[4]

In 1913 there arrived from Persia a rare manuscript on which was written: "Copied in the year AH 761 (1360) by one who carries back his ancestors to a man who studied directly under Avicenna himself in Hamadan the last home of the great Philosopher. Presented to Sir W Osler to whose sound teachings the profession all the world over owes so much, by M Sa'eed, July 1913".[2]

Osler replied on August 1st: "Dear Dr Sa'eed, — It is exceedingly kind in you to send me that beautiful Avicenna manuscript [the 'Isharat']. I have just shown it to Mr Cowley at the Bodleian who is delighted with it, and says it is in an unusually good state of preservation. Let me know please, at any time, of others that may be offered for sale, and I would particularly like a manuscript of Avicenna's poems. Mr Cowley tells me that he thinks modern volumes of his poems have been issued. I would like very much if you could have someone take a good photograph of the tomb of Avicenna, and send me a memorandum of the cost. I am interested also in Rhazes. How long shall you be staying in Hamadan? I should like to send you a copy of the new edition of my Text-book (1912)".

Cushing describes their first meeting as follows: "And among other pilgrims to 13 Norham Gardens [Osler's Oxford home] at this time [September 1913] was a foreign-looking physician, Dr M Sa'eed, who bore under his arm an illuminated MS of the Canon of Avicenna, wrapped in a Persian shawl almost as old, together with two other books without which, as he said, he never moved — his Bible, and Osler's 'Practice of Medicine'; and it is certain that all the Arabic MSS in the Bodleian were got out for inspection and there was much talk about Avicenna and the plan to get his dilapidated tomb repaired".

"The Evolution of Modern Medicine" contains a picture of the tomb and these words: "Avicenna died in his fifty-eighth year. When he saw that physic was of no avail, resigning himself to the inevitable, he sold his goods, distributed the money to the poor, read the Koran through once every three days, and died in the holy month of Ramadan. His tomb at Hamadan, the ancient Ecbatana, still exists, a simple brickwork building, rectangular in shape, and surrounded by an unpretentious court . . . The illustration . . . is from a photograph sent by Dr Neligan of Teheran. Though dead, the great Persian has still a large practice, as his tomb is much visited by pilgrims, among whom cures are said to be not uncommon".[11] The restoration of the tomb had become important to him. Early in 1914 he was writing to F H Garrison the medical historian: "I am taking no steps about the Avicenna tomb until I get an estimate; then I will arrange a committee and send a circular".

In the next few months there was much correspondence about this, and when Dr Sa'eed was leaving England Osler wrote him: "I had a note this morning from Mr Funk with the estimates — repairs at £100 and £300 to provide an income of £15 a year for a caretaker. This amount I am sure we could raise. Would it be possible to have it done under the auspices of the Regent or of the Shah, so that we could put at the head of the circular 'under the auspices of His Etc., Etc.'? I am writing to Funk and to Neligan at once, asking them as to the names of men in Persia who should go on the committee. . . . Goodbye! I hope you will have a very comfortable journey. It has been so nice to see you. Do let me hear how everything progresses. I suppose your address is Hamadan".

The Proceedings of the historical section of the Royal Society of Medicine record that at the meeting held on May 27th, 1914, "Sir William Osler called attention to the need for restoring the tomb of Avicenna. He stated that the sarcophagus still

exists and that from time to time the tomb itself has been repaired. The present cost of repair and the expense of keeping a watchman would be from £500 to £600, a sum which might perhaps be raised without much difficulty by the combined action of the Société Francaise d'Histoire de Médécine with the Royal Society of Medicine, these two societies being especially named because they represented the two European nations most interested in the state of medicine in Mohammedan countries. He suggested that the Persian Government should first be approached and, if a favourable reply were received, that a subscription list should afterwards be opened".[13]

But the world was soon to be enveloped in war. On the day that Osler and his colleague, Professor Margoliouth, spoke in London at a meeting of the Persian Society, to arouse interest in the tomb there was a test mobilisation of the three British fleets at Spithead on Winston Churchill's orders.[2] After the outbreak of war Osler wrote to Dr Neligan: "There is nothing to do but postpone matters relating to Avicenna's tomb, and keep your eye open please for any good MSS. I am very anxious to have one of Rhazes".

The war did not spare the Middle East, as seen from this letter of October 1916 from Dr Sa'eed: "As you see by the address I was compelled to escape from Hamadan about four months ago for the Turks led by the Germans were coming, and the fanatic Kurds too were ready to put an end to this apostate Kurd". As Cushing comments: "Small chance for the tomb of Avicenna". Occasional glimpses of Dr Sa'eed continue, and Osler writes to a friend in May 1917: "The Persian Embassy sent me a fine Rhazes MS in Arabic the other day. I expect it came from my friend Sa'eed".

After the war, and the terrible grief he suffered at the loss of his beloved son Revere, Osler took up the project again and in July 1919, in a letter to Dr Charles Singer; "In '14 we had almost completed arrangements for the repair of the Prince's tomb at Hamadan. We must take it up again. I have written to Neligan, . . . to find out just how far he had proceeded, i.e. whether he really had the Shah's consent". The project remained incomplete at his death on December 29th, 1919. Cushing summarises Osler's efforts in this matter in a long footnote " . . . Osler attempted to arouse the interest of the profession by letters to the journals; by getting Dr Sa'eed, on another visit to England, to speak at the Historical Section on the subject; . . . even the war and its aftermath did not cause him to leave off. Meanwhile Avicenna's tomb continues to disintegrate. Of it Dr Sa'eed wrote at this time: 'the date of 1294 AH at the top is the date of renewing the place by the daughter of the Shah. The dome also was built by the Princess but is decaying and needs attention. Inside it is black with the smoke of wood opium and hashish used by the Dervishes who take shelter there'".

Osler's affection for Avicenna can be seen in these lines from "The Evolution of Modern Medicine": "The touch of the man never reached me until I read some of his mystical and philosophical writings translated by Mehren. It is Plato over again. The beautiful allegory in which men are likened to birds snared and caged until set free by the Angel of Death might be met with anywhere in the immortal Dialogues. The tractate on Love is a commentary on the Symposium; and the essay on Destiny is Greek in spirit without a trace of Oriental fatalism, as you may judge from the concluding sentence, which I leave you as his special message: "Take heed to the limits of your capacity and you will arrive at a knowledge of the truth. How true is the saying: – Work ever and to each will come that measure of success for which Nature has designed him"".[11]

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The Ulster Medical Journal, Volume 60, No. 1, p. 129, April 1991.

Book review

Difficult medical management. By R B Taylor. (pp 729. £47.00). Philadelphia: W B Saunders Company, 1991.

This book considers a series of acute and chronic medical management problems. Separate chapters on each topic give some essential background information before concentrating on therapeutic options. Some are dealt with in quite a didactic fashion, others enter into broader discussion. The chapters I read were clear and informative. Some bits of pharmacology were difficult to translate from US to UK practice. On a few occasions treatments suggested are a little surprising reflecting also different practice across the Atlantic. The difficulty with this book, however, is in deciding who in the British Isles will wish to buy and read it. For hospital physicians, who have chosen the difficult and often ill understood role of maintaining a general interest in internal medicine, there is much that is useful and interesting. But even the most broadly based hospital physician will find this book rather too wide ranging with its coverage of some paediatric and psychiatric issues. On the other hand most family practitioners in this country (and it is their counterparts in the USA for whom this book is mostly intended) will find the orientation too much towards hospital practice.

P M BELL

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