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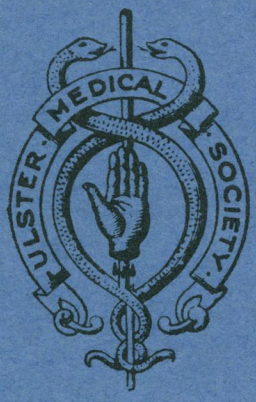

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2. Manuscripts should be typewritten with double spacing and with wide margins. They should be fully corrected, and contributors will be responsible for the payment of any sum charged for alteration in printer's proof.

3. References should be restricted to those really necessary and useful. This Journal has used the Harvard reference system. Aware of the burden imposed on authors by the different styles required by different journals it has been decided to support the move by an increasingly large number of major medical journals to the 'Vancouver style'. Papers for volume 50 to appear in early 1981 should conform. Details appear in the British Medical Journal 1979; **1**: 533-535 and in Lancet 1979; **1**: 429-430. Journal titles are to be abbreviated to the style of the Index Medicus or given in full.

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5. Tables must be kept simple and should avoid vertical lines. They and illustrations must be kept to a minimum and data should not be given in both text and tables. Line drawings should be used whenever possible. All illustrations must be in a form ready for publication. Authors may be charged for all blocks at cost prices.

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VOLUME 49 1980 No. 2

SOME HIGHLIGHTS OF OBSTETRICS IN IRELAND

by

J. F. O'SULLIVAN, M.B., F.R.C.S., F.R.C.O.G.

Consultant Obstetrician

JUBILEE AND ROYAL MATERNITY HOSPITALS, BELFAST

Based on a lecture to the Ulster Obstetric and Gynaecological Society

THERE has been a noble tradition in the art of Obstetrics in Ireland. Our Universities alone award the Degree of the Bachelor of the Art of Obstetrics. Unfortunately during the golden age of medicine in Ireland no obstetrician ranked with Colles, Corrigan, Cheyne, Stokes and others. At the Combined Meeting of the British, Irish and Canadian Medical Associations held in Dublin in 1976, a lecture was given on Ireland's contribution to medicine throughout the ages. Mosse was the only obstetrician mentioned.

James Wolveridge, born in England, graduated from Trinity College, Dublin, in 1664. He practised medicine in Cork. He has been given the credit for writing the first textbook of midwifery in the English language. Dr Aveling (1884), the well known obstetric historian, described his book to the London Obstetric Society as the earliest original work in midwifery in English by an English author. This obviously may be disputed but it certainly is one of the earliest works to appear in English. The first original work in English was Harvey's "De Geratione Anamilium" in which one chapter was devoted to "De partu". This fact prompted Aveling to describe Harvey as the Father of British midwifery. His book was published in 1651 in Latin and then translated into English and published in 1653. Despite Aveling's claim, Harvey is better remembered as a physician for he discovered the circulation of the blood in 1616 and published his findings in his book "De Motu Cordis" in 1628. There were several earlier books in English but they were translations of continental authors. "The Birth of Mankynde" was published over one hundred years earlier in 1540. It was a translation of Rosslin's "De Partum Hominis" published in 1532 on

the continent. A later book "The Expert Midwife", published in 1637, was a translation of Rueff's "De Geratione Hominum" published on the continent in 1632.

Wolveridge's book was printed in two editions—the "Irish Midwives Handmaid" or "Speculum Matricis Hybernicum" in 1670 for the Irish market, and "The Expert Midwives Handmaid" or "Speculum Matricis" printed in 1671 for the English market. The books consisted of one hundred and fifty-six pages with eight plates and twenty-one illustration in the text. They contain an account of midwifery of the time and do not differ from other authors. Indeed, many of the figures were copied from the books of Rosslin and Rueff. They may be considered as the forerunners of the popular "catechism series". The contents are in the form of a dialogue between doctor and midwife—Dr Philadephos and Mrs Eutrapalia.

In the preface, Wolveridge wrote:

"Go little book, I envy not thy hap,
Mayest thou be dandled in the ladies lap,
I hope the ladies will not thee disdain,
Thou are clean, though in a home-spun dress and plain,
Nor mayest thou to a gawdy garb aspire,
Thy nature idiom is thy best attire".

In spite of the home-spun dress, Wolveridge used both Latin and Greek marginal notes—hardly a book for midwives of that day or indeed even obstetricians of today! In the English edition he wrote: "It hath an English dress under an Irish mantle"—it never being intended for the Irish—"whose fruitfulness is such that there is scarce one barren amongst them, etc."

Herbert Spencer (1927), another medical historian, suggests that the books are sheer plagarism from "The Expert Midwife" by Rueff. An appearance of originality had been given to the work by putting it into the question and answer form. The frontispiece drawn by Cross of Cork was original. It has two compartments—the upper representing the midwife, the patient and the infant, while the lower represents the doctor, midwife and the pregnant woman. Plagarism was rife at that time and it has been suggested that printers stole copies of books from one another and published them anonymously. A later anonymous book "The English Midwife Enlarged" was published in 1682. It copies Wolveridge's book almost word for word—using the question and answer technique.

There are seven copies of Wolveridge's books, now over three hundred years old, still available. Two copies of the Irish edition are available, one in the Univeristy of Lund, Sweden (Essen-Moller 1932) and the other in the Bodelian Library, Oxford. Five copies of the English edition are extant, in the libraries of the College of Physicians, Edinburgh, the Medical Library of Manchester University, the College of Physicians, Dublin, the College of Surgeons, London, and in the College of Obstetricians, London. There are two manuscript copies in the library of the Royal Society of Medicine.

Until recent times, most deliveries were performed by handy women, few doctors being interested. Indeed, the College of Physicians in Dublin refused to examine Fielding Ould for the degree of Bachelor of Physics at the request of Trinity

College—on the grounds that the candidate was, by his calling, a man midwife and therefore disqualified from obtaining a medical degree! Many of the handy women were of the Sarah Gamp type as described by Dickens, but in Ireland we had one whose memory has not been honoured in the way it should. She was Mary Donnelly. She performed the first successful caesarean section in the British Isles in 1738. This fact was noted by Smylie in his textbook. Fielding Ould (1742) in his "Treatise of Midwifery" unhesitatingly condemned this type of operation. He wrote: "I have taken upon me absolutely to explode the Caesarean Section operation as repugnant not only to all the rules of Theory and Practice but even humanity". He elaborated further and described the operation as detestable, and a barbarous illegal piece of inhumanity.

The description of this historic operation was published in "Edinburgh Medical Essays and Observations". The details were published by Mr Duncan Stewart, Surgeon in Dungannon (Stewart 1752) and a letter from Dr King of Armagh City confirmed the report. The details are as follows:

> Alice O'Neill, aged about thirty-five years, Wife to a poor farmer near Charlemont and Mother to several children, in January, 1738, was taken in labour, but could not be delivered of her child by several women who attempted it. She remained in this condition for twelve days; the child was thought to be dead after the first day.
>
> May Donnelly, an illiterate woman, but eminent among the common people for extracting dead births, being called, tried also to deliver her in the common way; and her attempts not succeeding, performed the Caesarean section operation by cutting with a razor, first the containing parts of the abdomen, and then the uterus; at the aperture of which she took out the child and the secundies. The upper part of the incision was an inch higher, and to one side of the navel, and was continued down-wards, in the middle betwixt the right os ilium and the linea albus. She held the lips of the wound together with her hand till one went a mile and returned with silk and the common needles which tailors use. With these she joined the lips in the manner of the stitch employed for hare lip; and dressed the wound with white of eggs. The cure was completed with salves of the midwife's own compounding. In about twenty seven days the patient was able to walk a mile on foot.

She later attended Surgeon Stewart with an incisional hernia which he treated conservatively. He reported that he met her regularly in Dungannon—the patient having walked six miles from her home to the town.

It was only in 1889 that the first caesarean sections performed by doctors in which the mother and child lived were reported. In that year, Sir Arthur Macan (1890) in the Rotunda performed the operation and Sir John Campbell (1890) of Belfast also reported successful operations.

Bartholomew Mosse was born in 1712 at Maryborough. Trinity College Medical School had been established one year earlier in 1711. He qualified as a surgeon in 1733 and as a licentiate of The King's and Queen's College of Physicians in 1742. The conditions under which the Dublin poor lived made an indelible impression on him. He wrote: "Their lodgings are generally in cold garrets open to every wind, or in damp cellars subject to floods from excessive rains; themselves destitute of

attendance, medicines and often proper food; by which hundreds perish with their little infants and the community is at once robbed of mother and child".

With the help of friends he purchased a house in George's Lane, Dublin, and opened his "lying-in hospital for the poor". It had twelve beds. It opened on 15th March 1745 and Judith Rochford was the first patient to be delivered in it. The building is now a cake and wallpaper shop in South Great George's Street, Dublin (Fleetwood 1951). In the twelve years of its use as a hospital, 3,975 women were delivered, at a cost of £3,913.13.0d—a hospital administrator's dream! The maternal death rate was one in one hundred, stillbirths were one in thirty-four deliveries and neonatal deaths one in seventeen births (Kirkpatrick 1913).

Money was badly needed so Mosse appointed his friends as Governors and raised money by lotteries. He had two aims:

1. The relief of the poor pregnant women.
2. The teaching of midwifery.

He had tremendous enthusiasm and vision. He won a prize in a state lottery in London and on 15th August 1748 he bought four acres and one rood of land on the North side of Great Britain Street. This is the site of the present Rotunda Hospital. He planned to build a hospital of one hundred and fifty beds, pleasure gardens and rooms for entertainment to finance the hospital. The hospital was designed by Richard Casels, the architect who also designed Carton and Powerscourt Houses. The hospital was built by direct labour under the direction of Mosse and the architect. The foundation stone was laid on 24th May 1751 and it opened on 8th December 1757. Band concerts and garden parties were held during this time to raise money. In 1754 lotteries were declared illegal but Mosse was fortunate in winning £2,260 in a Dutch lottery. In the following year he tried to take part in another Dutch lottery but was arrested in Wales. He escaped from custody but had to swim the Menai Straits to avoid recapture! The first phase of fifty beds was opened and Mary Rea and Elizabeth Knight were delivered on the opening day.

Mosse unfortunately died suddenly in February 1759 at the age of forty-seven. His famous four-poster bed which had been made specially for the Master's bedroom in the hospital was bought by the late O'Donel Browne in 1944 at a public auction and so it has been preserved for posterity. Mosse's remains were interred in Donnybrook cemetery. No trace of his grave could be found in 1847 when Sir William Wilde commenced to write his life story. Unfortunately for us Sir William lost all the original notes and record books of the hospital which had been lent to him for the purpose of his study. The vision of this one man made Dublin one of the foremost centres of midwifery for many years.

Progress in obstetrics was naturally centred in Dublin for some time to come. Fielding Ould was appointed second Master. He was born in Galway in 1710. His grandfather came to Ireland with King William's army. He published his textbook "A Treatise of Midwifery" in 1742, seventeen years before he became Master of the Rotunda. In this book he described the mechanism of normal labour for the first time. He also introduced the management of the third stage which was later described in more detail by Clarke in 1786 and is now known as the Dublin method of delivering the placenta. His other claim to fame was the delivery of the Countess of Mornington of a son in 1769. This son became the Duke of Wellington. There

were many wits in Dublin at that time. Ould was knighted in 1760. An epigram was written:

Sir Fielding Ould is made a knight,
He should have been a lord by right,
Then the ladies prayer would be,
'O Lord, Good Lord, deliver me'.

During his time as Master he completed the round rooms at the hospital, hence the usual name of the Rotunda Hospital.

The fetal stethoscope was first used in clinical practice in the British Isles in Dublin. J. C. Ferguson, a native of Tandragee (Graham 1950), then Professor of Medicine at Apothecaries Hall, Dublin, was the first doctor to report this in 1830. He moved to Belfast and his original contribution appeared lost, although O'Donel Browne (1947) acknowledged his work. René Laënnec invented the stethoscope in 1819. His pupil Vicomte De Kergaradec applied the stethoscope to the pregnant abdomen. He thought that he would hear the baby splashing in the liquor but to his surprise he heard the fetal heart. McAdam who was an Assistant Master in the Rotunda wrote about the use of the stethoscope in 1832 during the Mastership of Collins. Evory Kennedy in 1834 published a textbook on the subject and many people now wrongly give him the credit for introducing the fetal stethoscope into Ireland.

Its introduction to clinical use was not without controversy. Indeed, Collins had to defend McAdam. Professor James Hamilton of Edinburgh was opposed to it and heated correspondence developed in the medical press. On one occasion Hamilton wrote: "If you propose to apply the stethoscope to the naked belly of a woman you may be assured that in this part of the world at least such a proposal would be indignantly rejected by every young or old practitioner of reputed respectability" (Ratcliffe 1967).

Many forceps were invented by Dublin obstetricians but only one is in use today. In 1878, Barnes of London described his forceps and eight years later Neville, who was then the Assistant Master in the Rotunda, developed his traction handle to fit that forceps (Neville 1886).

William Featherstone Montgomery was born in Dublin in 1797 and died there in 1859. In 1827 he was appointed as first Professor of Midwifery in the College of Physicians, Dublin. He was an extremely able doctor and was elected President of his College for two separate terms of office. Despite this, little is known about him by local obstetricians until 1958 when the American historian Harold Spreet included Montgomery's life in the book "Obstetrics and Gynaecological Milestones". This stimulated Professor J. B. Fleming of Trinity College to seek further information about him locally (1966).

Before the development of biological and biochemical tests for the diagnosis of pregnancy the doctor's only means of reaching a diagnosis was by the interpretation of the various body changes which the pregnant state produced. A series of signs were named after various authors, for example, Hegar, Jacquemier, Braxton, Hicks, etc. Breast changes were first adequately described in English by Montgomery in his book "An Exposition of the Signs and Symptoms of

Pregnancy" (1837). A copy of this book is available in the Simms collection in the Medical Library, Queen's University, Belfast. In the book Montgomery has produced seven coloured drawings of a patient's breasts from the third to the ninth month. The patient permitted an artist to do this at each visit. "I believe", wrote Montgomery, "that such a series of illustrations are now for the first time laid before the Profession". With each drawing he wrote a long description of the changes from the preceding month. It is interesting to note that although the fetal stethoscope had been used in Dublin by Ferguson, Montgomery does not mention it. In the fourth chapter of his book he discussed the different opinions of authors on the changes in the areola during pregnancy. He wrote: "These differences are due to want of sufficient care in observing and accuracy in describing the findings". How often have similar sentiments been expressed by medical teachers since that time! Montgomery acknowledged the writings of Roederer on the breast changes. His own description was more elaborate.

Montgomery published many papers but is best remembered for his signs and symptoms of pregnancy and the spontaneous amputation of fetal limbs in utero. He collected a large number of specimens for the Obstetric Museum in the College of Physicians. In 1859, after his death, it was transferred to Queen's College, Galway.

When the London Obstetric Society was founded Montgomery was elected as an Honorary Member. On his death, Arneath of Vienna wrote that his name is known and honoured wherever midwifery is practised. It should be noted that his book is devoted mainly to changes in the breast, especially the areola, but he is remembered because his name has been given to the tubercles in the areola.

Montgomery was not attached to any of the well known Dublin Maternity Hospitals. There were many small maternity hospitals and it is presumed that he worked in some of these. His great grandson was the late Mr H. L. Hardy Greer, for many years Senior Obstetrician in the Royal Maternity Hospital, Belfast. Montgomery is buried in Mount Jerome Cemetery, Dublin.

Macafee (1945) described his experience of the conservative management of antepartum haemorrhage due to placenta praevia. This article was a watershed. It led to the abandonment of the active management of bleeding due to placenta praevia early in the third trimester. His policy formulated in the Royal Maternity Hospital, Belfast, is now adopted in all countries throughout the world. When asked how he had formulated his plan, Macafee simply stated that he had listened to his patients. He realised that many patients had several haemorrhages during the latter months of pregnancy but they did not seek medical help until bleeding occurred at near full term. Only then did they seek help for themselves because they thought they might be starting labour. He realised that if these women could go about at home with impunity they could be kept in hospital to near term and so the baby would be allowed to become more mature.

During the five years 1932 till 1936, before the conservative treatment was introduced the maternal loss was 2.6 per cent and the fetal loss was 51.3 per cent. During the following eight years, using Macafee's conservative technique, the maternal loss fell to 0.57 per cent and the fetal loss to 23.6 per cent. In 1963, his last year in active practice, this management resulted in no maternal loss and a fetal loss of less than 10 per cent.

"These men have lived their useful day,
And to the shades have passed away.
They handed on the Lamp of Truth,
To light the steps of ardent youth.
And we their age-long heirs to-night,
Must hand it on undimmed and bright".

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SURVEY OF QUEEN'S UNIVERSITY MEDICAL GRADUATES

by

ELIZABETH A. EGERTON, B.A. (Mod.)

Northern Ireland Council for Postgraduate Medical Education

INTRODUCTION

IN RECENT years a growing concern about manpower problems within the National Health Service, the maldistribution of medical staff and the high rate of emigration among doctors has precipitated a number of surveys of medical manpower in Great Britain, most of them relating to choice of specialty.

Little work, however, has been done in this field in Northern Ireland. One of the main functions of the Northern Ireland Council for Postgraduate Medical Education is to provide a careers information and advisory service for recent graduates. This service is limited by a lack of basic information about the factors which influence young doctors in choosing a specialty and deciding in which part of the world they will practice. There is no reliable information available about the career preferences of Queen's medical students; how these preferences may be influenced by academic achievements and home background or how preferences may change as students are exposed to various specialties and aspects of medical practice during their undergraduate and early postgraduate years. Information about the ultimate location of Queen's medical graduates has been derived largely from heresay.

In an attempt, therefore, to obtain a better understanding of the subject, Council has undertaken a two-fold survey with the assistance of the Faculty of Medicine. In general terms the objectives of the survey are:-

1. To collect information on career preferences and their determinants and the desired location of practice among Queen's medical undergraduates and how far these are or can be fulfilled.
2. To collect information on the chosen specialty and on the destination (transient and permanent) and its determinants of Queen's medical graduates.

This paper is a report on the second aspect of the study, and includes references, where relevant, to other work done in the Republic of Ireland, Great Britain and the United States. Details concerning the undergraduate survey have been published separately (Egerton, 1979).

METHOD

Five cohorts were chosen for the study (those who graduated in 1950, 1955, 1960, 1965 and 1970) in the belief that they might offer a fairly representative sample of graduates over the past 25 years. It was decided that the 1975 graduates should not be included, since the majority could not be expected to have made firm decisions about their career and ultimate location of practice two years after qualifying.

Graduation lists were obtained from the Secretary's office, and current addresses, where possible, from the Medical Directory and Medical Register, and, in the case of

those living abroad, from relations and former colleagues still in this country, and from the General Medical Council.

Of the total of 418 graduates, 15 were known to be dead. Addresses were obtained for all but 9 of those believed to be alive and 394 postal questionnaires were distributed at the end of September and the beginning of October 1977. In the event, 8 of the addresses were found to be out-of-date when the questionnaires were returned by the Post Office and no forwarding addresses could be obtained. Consequently the total number of questionnaires presumed to have reached their destination was 386. Reminders, personally signed by the Chairman of Council, then the late Sir John Biggart, were sent out in January and again in April 1978, bringing a response of 357 completed forms, 88.6 per cent of the number of doctors believed to be alive, and 93 per cent of the number presumed to have received forms (Table 1).

TABLE I

Number of questionnaires distributed and returned

Year	*Total No. of graduates*	*No. believed to be alive*	*No. presumed to have received forms*	*No. of forms returned*	*As percentage of those presumed to have been received*	*As percentage of those believed to be alive*
1950	93	86	84	78	92.7	90.7
1955	90	86	80	74	92.5	86.0
1960	63	62	57	53	93.0	84.1
1965	71	69	67	*58	86.6	84.5
1970	101	101	98	94	95.9	93.1
TOTAL	418	403	386	357	93.0	88.6

*Another two questionnaires, making a total of sixty, were returned too late to be included in the statistical analysis.

The questionnaire covered (1) background information (age, sex, marital state, place of residence before going to Queen's); (2) employment (whether working and, if so, specialty/ies practised; if not, former employment); (3) present location: if living abroad, reasons for leaving Northern Ireland and feelings about returning; and (4) comments.

RESULTS

Background Information

Age at Graduation

The majority of students (62.8 per cent of the 1950 cohort, 77 per cent of the 1955 cohort, 79.2 per cent of the 1960 cohort, 70.7 per cent of the 1965 cohort, and 89.4 per cent of the 1970 cohort), were aged 23 to 25 on graduation. One of the 1950 graduates commented (later on the questionnaire) that his was not a typical year. A number of the students were ex-servicemen and consequently their choice of

specialty was probably influenced by the need to earn a good income as soon as possible. Although this sounds a reasonable assumption, the percentage of 1950 doctors graduating over the age of 26 (24.4 per cent) does not exceed the average for the five cohorts (21.2 per cent) to the extent one would expect, and is considerably less than the 1965 figure (29.1 per cent). Clearly, then, the age factor alone is no more likely to have influenced choice of specialty in 1950 than in subsequent years. In fact the most noticeable point of variation in 1950 is the relatively large percentage (12.8) who graduated under the age of 23. Only one other from the five cohorts, a 1960 graduate, did so. This is because the main graduation in 1950 was in December, the medical course being then a five and a half year one. After 1950, the course changed to one of six years' duration. The person who graduated at the age of 22 in 1960 had presumably been exempted from the first MB year, or had his twenty-third birthday immediately after graduating (or possibly both).

Present Age

The fact that questionnaires were returned over a period of eight months has meant a slightly wider spread of present age distribution, depending on the exact date of birth. At the time of completing the questionnaire, 60.2 per cent of the 1950 cohort was aged between 50 and 52, 71.6 per cent of the '55 cohort between 45 and 47, 75.5 per cent of the '60 cohort between 40 and 42, 67.3 per cent of the '65 cohort between 35 and 37, and 86.1 per cent of the '70 cohort between 30 and 32.

Sex

Responses from women doctors made up less than a quarter of the total (80, or 22.4 per cent). There were 25.6 per cent in the '50 cohort, 27 per cent in the '55 cohort, 20.8 per cent in the '60 cohort, 17.2 per cent in the '65 cohort and 20.2 per cent in the '70 cohort. These percentages are closely representative of the distribution of the sexes among the total number of graduates in each cohort (an average of 22.4 per cent women). Men and women, therefore, were equally conscientious about returning the questionnaires. The undergraduate aspect of this study, which was concerned with the 1976-77 second, fourth and final year students, showed that an average of 33.4 per cent of the students were female, a considerable increase on the current survey.

Marital State

The vast majority of the respondents (89.1 per cent) were married. Of the remainder, predictably, more of the younger doctors were single and more of the older ones were widowed.

Place of Permanent Residence before entering Q.U.B.

Table II illustrates the place of permanent residence of the respondents before entering medical school. Of the small number classified under "elsewhere", 10 came from African states, 10 from various parts of Asia, 5 from North America and 1 from Hungary. Most striking is the upsurge of students coming from outside Northern Ireland in the 'fifties, 17.1 per cent of the 1954 intake (i.e. the 1960 cohort of graduates), almost doubling to 29 per cent of the 1959 intake (the 1965 graduates), followed by a dramatic decrease to 4.3 of the 1964 intake (the 1970

TABLE II

Place of permanent residence before going to QUB

	1950	*1955*	*1960*	*1965*	*1970*	*TOTAL*
N.I.	76	66	44	41	90	317
	(97.4)	(89.2)	(83.0)	(70.7)	(95.7)	(88.8)
Rest of UK	1	5	2	3	3	14
and Eire	(1.3)	(6.8)	(3.8)	(5.1)	(3.2)	(3.9)
Elsewhere	1	3	7	14	1	26
	(1.3)	(4.1)	(13.3)	(23.9)	(1.1)	(7.3)

graduates). Data emerging from the parallel undergraduate study appear to indicate, however, a slight increase in the number of students from outside the province in the 'seventies (5.7 per cent of the 1971 intake, 7.7 in 1973 and 8.5 in 1975).

Present Employment

Of the 357 doctors who returned the questionnaire, all but six (married women) were engaged in some type of medical practice. Four of the six were 1970 graduates; the others were 1950 graduates. (The questionnaire did not differentiate between full and part-time employment).

Table III gives the specialties practised by those who were working. Respondents who were engaged in more than one specialty were not asked to indicate their main field, which means that there is a certain amount of overlap as the total number of specialties indicated was 408. In fact, a total of 43 doctors listed more than one specialty.

General practice, which attracts the greatest percentage of graduates each year, enjoyed its highest recruitment level (47.4 per cent) in 1950. Whether this was a result of the number of ex-servicemen who graduated that year (as suggested by the respondent mentioned previously), or of the lack of opportunity in hospital medicine, or whether indeed it was purely fortuitous, is open to conjecture.

On average, the second most popular specialty was anaesthetics, with medicine, surgery and community medicine lying equal in third place. From year to year, however, the pattern varies somewhat, psychiatry ranking third among the 1955 graduates and academic medicine and research lying second among the 1965 graduates. One might possibly generalise by saying that general practice, medicine and surgery (in that order) attract most of our newly qualified doctors (as borne out by Council's Careers Information and Advisory Service year after year), but that the period 1950-1970 was one of rapid growth and development in anaesthetics colouring the findings of this enquiry. The enduring attraction of community medicine for women doctors is discussed more fully in the next section.

Of those who were not working at present, the two 1950 graduates had previously practised anaesthetics, general practice and medicine, and the four 1970 graduates had been engaged in community medicine (2) paediatrics (2) and medicine (1).

TABLE III

Numbers in each specialty

Specialty	*Number Practising*	*Specialty*	*Number Practising*
Academic Medicine and Research	27 (7.6)	Otolaryngology	2 (0.6)
Anaesthetics	37 (10.4)	Paediatrics	12 (3.4)
Community Medicine	29 (8.1)	Psychiatry	25 (7.0)
General Practice	141 (39.5)	Radiology/Radiotherapy	14 (3.9)
Medicine	29 (8.1)	Surgery	29 (8.1)
Laboratory Medicine	9 (2.5)	Others	25 (7.0)
Obstetrics/Gynaecology	18 (5.0)		
Ophthalmology	11 (3.1)	TOTAL	408

Factors Influencing Choice of Specialty

The figures in Table III were broken down further by the variables of sex and marital state in an attempt to ascertain whether these had any influence on choice of specialty.

Sex

The specialties favoured most by women doctors were general practice (40.5 per cent of the women worked in general practice) and community medicine (which absorbed another 25.7 per cent). These findings correspond closely with those of Scottish Council in their survey (1979) of the 1965 and 1970 graduates of the Scottish University medical schools. While general practice was equally favoured by the male respondents in our survey (40.1 per cent), there is a significant difference between the percentage of males (3.6) and females (23.8) working in community medicine ($p < 0.001$). It is perhaps pertinent that in the parallel study of Queen's medical undergraduates, after second year the female students had little interest in community medicine, and certainly no more than the men. It would appear the qualified women doctors tend to be drawn into community medicine (the school medical service, family planning, etc) after marriage, largely because of the availability of part-time work, flexible hours, and conditions that are more compatible with domestic responsibilities and family commitments. All of the women in our survey who were practising community medicine (19) were either married (17) or widowed (2). The Scottish Council reported that the majority of women in community medicine covered by their survey stated, when questioned, that they did not regard it as a long-term career prospect.

The other specialty where the numbers of males and females differed significantly was surgery. Twenty-eight (10.1 per cent) of the men had gone into surgery and only one woman (1.3 per cent) was working in this specialty ($p = 0.0001$), and then only one session per week. Unlike the previous case, where the female preference for community medicine appears primarily a result of circumstances, which emerge usually after qualification and as a result of marriage and family, the striking lack of

female interest in surgery appears consistent from the early undergraduate years. Whether women veer away from surgery, anticipating at an early stage the keen competition for surgical posts and the long intensive training which does not lend itself to interruption or part-time work, whether they are conditioned from an early stage to regard surgery as a male-dominated domain, or whether they dislike intrinsically the nature of the work, is open to conjecture. Whatever the explanation, the small number of women in surgery is a universal fact. Stanley and Last (1968) noted that "women, on the whole inclined towards careers either outside hospital or in specialties within the hospital system that were less demanding in terms of clinical responsibility". Research done in the United States (Kosa and Coker, 1965; Phelps, 1968; Westling-Wikstrand et al, 1970; Shapiro et al, 1968; Powers et al, 1969) confirms this pattern which is presumably due in both countries to the resistance in hospitals to more flexible working hours and part-time training, and to the lack of provision for child care.

Marital State

On the basis of our results, marital state appeared to have no bearing on choice of specialty among male doctors. On the female side, one cannot generalise because of the very small numbers of single women (12 out of a total of 80 female respondents). Seven of the 12 were working in hospital; the other five who were working outside hospital were all in general practice or in the case of one woman, combining the two.

Of the remaining 68 female respondents, 62 were working, 56 of whom were married, 4 widowed and 2 divorced. Assuming for the sake of argument that the choice of specialty and careers of the widowed and divorced women have also been subject at some stage to the influence of marital state and possibly children, we shall include these six with the 56 married women. Twenty-two (35.5 per cent) were engaged solely in hospital specialties, 33 (53.2 per cent) were engaged in general practice (16), community medicine (12), or both (5). Five (8.1 per cent) were general practitioners with sessions in hospital. The remaining two (3.2 per cent) were employed by the Blood Transfusion Service and the DHSS (on medical referee work). Two of the women included above (one in hospital medicine, one in general practice) were doing additional work, one in the field of medical education, examination and evaluation techniques, and the other as a part-time police surgeon. To summarise, 35.5 per cent were engaged solely in hospital medicine, and 64.5 were engaged either solely or primarily in branches of medicine outside the hospital.

Although the number of single women is very small, the figures would appear to suggest a pattern that differs from that of the married women. The distribution of specialties among single women does not differ radically from that of the male doctors (except in respect of surgery). One might say that it is apparently not so much a woman's sex as her marital state which exercises most influence on her choice of specialty.

Place of Residence

Of the total number of respondents irrespective of origin or nationality (357), 58 per cent were living outside Northern Ireland. This includes, of course, graduates from abroad who have returned to work in their own country. Of more interest to those concerned about medical manpower in this country is the present location of

those who were resident in Northern Ireland before going to QUB, summarised below in Table IV.

Of those resident in Northern Ireland before going to QUB, 170 (53.6 per cent) are now living outside the province, the most popular destinations being Great Britain (22.4 per cent) and Canada (16.4 per cent). Other developed countries favoured by emigrants from Northern Ireland were the United States (5.4 per cent), Australia (2.2 per cent) and New Zealand (1.3 per cent). Seven (2.2 per cent) had gone to various parts of Africa, and three (0.9 per cent) to parts of Asia.

TABLE IV

Present location of those resident in N. Ireland before going to QUB

Country living in	*Northern Ireland*	*Rest of UK & Republic of Ireland*	*North America*	*Australia and N. Zealand*	*Africa and Asia*	*HM Forces*
Number and percentage	147 (46.4)	77 (24.3)	69 (21.8)	11 (3.5)	10 (3.1)	3 (0.9)

Little work appears to have been done on emigration patterns elsewhere in the British Isles but it is probably of little benefit to compare statistics on emigration, since many of the governing circumstances are unique to us; notably the insular geographical position of our country, our peculiar divided cultural inheritance and our political problems. Nonetheless consideration of other relevant work is of interest. Scottish Council reported (1979) that between 11 and 14 per cent of the 1964 graduates of the Scottish medical schools and approximately 8 per cent of the 1970 graduates had emigrated. Our figures are startlingly high in comparison. However, our situation is probably more comparable with that of Eire. There Joyce and Murphy (1972) showed that over the previous twenty years, approximately 15 per cent of Irish born graduates had emigrated to North America and that approximately 33 per cent were resident in Britain, totalling over 48 per cent outside Ireland.

Of the Ulster-born doctors who were living outside the British Isles (90 excluding those in HM Forces), 88.9 per cent were in developed countries and 11.1 per cent in developing countries. Oscar Gish found that 30 per cent of the subjects in his survey (1970) of all British and Irish-born doctors leaving Great Britain between 1962 and 1967 were destined for developing countries. The figures are not comparable, however, as our statistics tell us only how many are in developing countries at the moment and do not include those who have gone for a short period and returned. Gish found that, of more than 200 who emigrate from Great Britain to developing countries each year, "an almost equivalent number come back to Britain". Of the 63 per cent in Gish's survey who left for developed countries, 34 per cent went to Canada, 24 per cent to the United States and 32 per cent to Australia and New Zealand. His survey showed that only about one-third of these emigrants to developed countries return.

TABLE V

Emigration rate of doctors resident in N. Ireland before going to QUB

	1950	*1955*	*1960*	*1965*	*1970*
Total number of graduates resident in N. Ireland before going to QUB	76 (100.0)	66 (100.0)	44 (100.0)	41 (100.0)	90 (100.0)
Number of above who have left N. Ireland	48 (63.2)	42 (63.6)	22 (50.0)	18 (43.9)	40 (44.4)

Table V shows that the rate of emigration of doctors originating from Northern Ireland has declined a little over the past twenty-five years.

While it is still possible that more of the 1970 graduates will emigrate, the trends in Table VI suggest otherwise. In the past, the vast majority of doctors who have left Northern Ireland have done so within eight years of graduation, (i.e. before being appointed to a career post), whilst the peak period for emigration has been on average within the first three years after graduation. The 1970 cohort follows the general pattern, a very large proportion of them emigrating as house officers and senior house officers or newly appointed general practitioners, but after the first three years the rate dropped considerably.

In compiling Table VI from the detailed figures on every year from 1950 to 1977, it was decided to choose the groupings 0 to 3 years, 4 to 8 years and over 9 years after graduation, as the information fell so clearly into that classification. These groupings also correspond loosely with the house officer and senior house officer, registrar and senior registrar and consultant or career post periods, although this was not the basis on which they were chosen.

TABLE VI

Emigration of N. Ireland doctors: number of years after graduation

Year of graduation	*0—3 years*	*4—8 years*	*8 years +*
1950	33 (68.8)	10 (20.8)	5 (10.4)
1955	26 (61.9)	11 (26.2)	5 (11.9)
1960	10 (45.5)	9 (40.9)	3 (13.6)
1965	9 (50.7)	8 (44.4)	1 (5.6)
1970	33 (82.5)	7 (17.5)	

The factors influencing the decision to leave the province are discussed more fully in the next section, but it is worth mentioning at this point two in particular, (1) lack of job opportunity in the early 'fifties and (2) the "troubles", which elucidate the peak figures for emigration for the 1950, '55 and '70 cohorts, within the first three years of graduation. As might be expected, the majority of doctors coming from elsewhere to study at Queen's (not included in Table VI) returned to their own country within three years of graduation.

It is interesting to note that the emigration rate of Scottish doctors forms a totally different pattern. Scottish Council found in its study of the 1962 graduates of the Scottish medical schools that "there appeared to be two main peaks, one being between three and six years after graduation and the other ten and eleven years after". In its subsequent study (1977) of the 1965 and 1970 graduates, Scottish Council reported an increase in emigration after eight to ten years among the 1965 graduates. Emigration of the 1970 cohort was fairly evenly distributed over the five years after graduation. In his study of all doctors born and qualified in the British Isles (including Eire) leaving Great Britain between 1962 and 1966, Gish found the following in relation to the number of years between *registration* and leaving: between 0 and 4 years 26 per cent, between 5 and 9 years 29 per cent, between 10 and 14 years 17 per cent and 15 years and over 29 per cent.

These varying trends in emigration rates would appear to suggest an underlying difference in motivating factors. In general it would appear that lack of opportunity at higher grades in hospital medicine is a more compelling reason for the doctors covered by Scottish Council's survey and that of Gish, than for Northern Ireland doctors.

Factors Influencing Decision to leave the Province

Those who were living outside Northern Ireland were asked to indicate on a given list factors which influenced their decision to leave the province. The list comprised the first seven reasons which appear in Table VII, plus "Others". Two main themes recurred so frequently under "Others" that these have been listed separately as factors 8 and 9. A number of doctors who graduated in the 'fifties spoke of the difficulty in obtaining posts in hospital medicine in Northern Ireland at that time (one used the phrase "closed shop"), of the shortage of posts in general practice and the restriction on opening new practices. The other recurrent reason for leaving, predominant obviously among the 1970 graduates, was the political situation and sectarian violence in this country, and the effects it might have on their children. As early as 1950, a few claim to have left because of the "undesirable community relations situation existing even at that time"; a few were looking for a "better political, social and cultural climate overseas", and "freedom from the stultifying parochialism of Northern Ireland". (These points have all been included under factor 9). Where more than one reason for leaving was given by a respondent (as was frequently the case), he appears more than once in Table VII and in the paragraph following on the subject of "other reasons".

Other reasons listed under "others" were as follows. Twelve doctors (mainly 1970 graduates, some in HM Forces, some not, specified a desire to travel, a "wanderlust". Another eight (mainly 1955 graduates) said they left to obtain training not available here at that time, without a view to returning. Specialties

TABLE VII

Factors influencing decision to leave the Province

		1950	*1955*	*1960*	*1965*	*1970*	*TOTAL*
1.	Return to work in own country	1 (2.0)	5 (10.2)	5 (16.1)	11 (33.3)	1 (2.3)	23 (11.1)
2.	Professional advancement	20 (40.0)	13 (26.5)	17 (54.8)	10 (30.3)	10 (22.7)	70 (33.8)
3.	Better working facilities	11 (22.0)	12 (24.5)	3 (9.7)	5 (15.2)	9 (20.5)	40 (19.3)
4.	Greater financial rewards	11 (22.0)	13 (26.5)	10 (32.3)	5 (15.2)	13 (29.5)	52 (25.1)
5.	To obtain specialist experience	4 (8.0)	2 (4.1)	5 (16.1)	8 (24.2)	4 (9.1)	23 (11.1)
6.	Greater job satisfaction	12 (24.0)	19 (38.8)	6 (19.4)	9 (27.3)	13 (29.5)	59 (28.5)
7.	Marriage or family considerations	5 (10.0)	13 (26.5)	7 (22.6)	4 (12.1)	14 (31.8)	43 (20.8)
8.	Unable to obtain suitable post in N.I.	14 (28.0)	9 (18.4)	1 (3.2)	1 (3.0)	0	27 (13.0)
9.	Community relations, violence and effects on children	1 (2.0)	5 (10.2)	1 (3.2)	1 (3.0)	16 (36.4)	24 (11.6)
10.	Others	4 (8.0)	10 (20.4)	3 (9.7)	4 (12.1)	8 (18.2)	29 (14.0)

The percentage figures in Table VII are based on the total number (207) living outside Northern Ireland.

mentioned were tropical medicine, skin pathology and psychiatry (this was in 1956, when QUB had no Department of Mental Health), and vocational training for general practice, before the GP training scheme was underway in Northern Ireland. Five doctors (fairly evenly distributed among the five cohorts) left to do medical missionary work. Three (all '50 graduates) left out of dissatisfaction with NHS conditions. Two 1970 graduates (husband and wife) left because the husband was advised that he was at risk working in Northern Ireland and one 1955 graduate left because of our "miserable" climate.

Ultimate Plans for Location of Practice

The vast majority of those who are now living outside Northern Ireland have no plans to return: some were emphatic about this. Of the 170 Ulster-born doctors at present outside the province, 120 (70.6 per cent) do not intend to return. Only 5 (2.9 per cent) said that they definitely intended to return; another 10 (5.8 per cent) said that they probably would, and 35 (20.6 per cent) said they might possibly return. Many of the latter added that the decision to return depended on a satisfactory

outcome to our political problems. Three who do not intend to return to work in Northern Ireland said they plan to settle here in retirement, and another two pointed out that they enjoy frequent holidays here, but would not contemplate working in this country.

Specific Comments made by Respondents

Most of the comments concerned topics which recurred with each of the cohorts, and which fall into the following broad categories.

(a) Twenty-six pointed out that the factors influencing their decision to leave the province were different from those affecting their return.

(i) Eighteen said that, although the unstable political situation was not the major reason for leaving, it would now present the major difficulty to returning. Two compared the quality of life here favourably with the affluence of the United States, where they found that many facets of their life-style detracted from personal professional satisfaction.

(ii) Six who were interested in returning spoke of difficulty in securing a post. Two had already been unsuccessful in application for consultant posts (one alleged this was due to religious discrimination); the others said that very few posts were advertised, appearing only occasionally in the British Medical Journal, and then with such a short period to the closing date for applications that prospective candidates abroad do not know about them in time. One respondent also claimed that the method of appointment to NHS posts was arranged to favour pre-selected candidates.

(b) Sixteen gave information about their past career, about the work they had been engaged in (i.e. general practice before administration) or about periods spent abroad before settling permanently in Northern Ireland.

(c) Nine paid tribute to the "invaluable" and "first-class" training they received at QUB, which they have found has given them "a tremendous start on colleagues from other universities".

(d) Seven asked if they might have a copy of the summary of the findings of this survey.

(e) Five said that they had left Northern Ireland originally with the intention of returning but that circumstances and opportunities which arose persuaded them to remain away.

(f) Two practising abroad, one in Canada, the other in the United States, contrasted their present freedom to practise how and where they wished, with what they saw as excessive "non-medical (non-physician) interference and control in medicine" in this country. Another two who are still in Northern Ireland, in general practice, spoke of their "growing disenchantment with the NHS as a reasonable paymaster". Their "inability to practice good GP, due to too heavy a work load and inadequate investigatory facilities" was becoming more irritating.

(g) Two 1955 graduates, both of whom had emigrated to Canada, mentioned that they had since returned to the province to take part in postgraduate courses which they had greatly enjoyed, one in general practice, the other in anaesthetics.

Other comments from respondents include one from a 1950 graduate, now resident in Canada who said that he would like to receive more communication from QUB. More could be done for the university, he felt, if the overseas alumni were organised. His suggestion would obviously apply more to Canada than any other country abroad, the relatively high proportion of Queen's graduates there undoubtedly contributing to the feeling of fraternity. One of the 1960 graduates commented on the strong contingent (25) of Queen's graduates in Brampton, Ontario, population 100,000. All were active, he said on the local hospital staff and three had been chiefs of departments in the 500 bed hospital.

A 1950 graduate (also living in Canada) was of the opinion that graduates should not be given their final diploma before they had given the province a reasonable return for their education and training. Whether this should also apply to other professions, or indeed all who enjoyed the benefit of tertiary education, he did not clarify.

Still on the topic of emigration, a 1955 graduate felt justified in having made his decision to leave, although it would have been much easier, he said, had he been younger (he left in 1972, at the age of 41). Another 1955 graduate said that he had had to return because of a family crisis, and that he would definitely not have returned otherwise. Conversely, a 1960 graduate who is practising aviation medicine in the RAF protested that emigration was not his intention, but an unfortunate consequence of postings.

Referring to his choice of specialty, a 1960 graduate whose father was a general practitioner, observed that although he had followed on in his father's practice, he was now quite sure that, had he not had the practice, he would have done paediatrics.

SUMMARY

Questionnaires were distributed between September and October 1977 to 394 doctors who had graduated from Queen's in 1950, 1955, 1960, 1965 and 1970, in an attempt to collect information on their chosen specialty/ies and location of practice. Replies were obtained from 357, 88.6 per cent of those believed to be alive.

The majority of the respondents (75.9 per cent) were between the ages of 23 and 25 on graduation. Among the 1950 graduates, there was known to be a number of ex-servicemen, although the percentage of 1950 graduates aged 26 or more (24.4 per cent) did not exceed the average percentage for the five cohorts (20.4 per cent) as much as might have been expected. An average of 22 per cent of the respondents were female—an exact reflection of the proportion of the total number of graduates who were female. The vast majority were married (89.6 per cent) and came from Northern Ireland (88.8 per cent).

Only 6 (all women) of the 357 respondents were not engaged in some form of medical work at the time of completing the questionnaire. Almost 40 per cent were in general practice; second most popular was anaesthetics with 10.4 per cent, and medicine, surgery and community medicine ranked equal third, each attracting 8.1 per cent of the respondents.

The sex of the respondents appeared to influence their choice of specialty in that a significant difference was found in the proportion of men and women engaged in

community medicine and in surgery. Speaking in terms of percentages, community medicine attracted seven times as many females as males, and surgery attracted seven times as many males as females. All the women who were practising community medicine were either married or widowed, and there is evidence (ref Scottish Council 1979) to support the view that the choice was based primarily on availability of part-time work and compatability with family commitments. The virtual abscence of women in surgery, on the other hand, would appear to be due to an intrinsic lack of interest as well as practical difficulties with inflexible training programmes and domestic responsibilities.

Less than half (46.4 per cent) of those resident in Northern Ireland before going to Queen's (317) were still living here; 24.3 per cent were in Great Britain or Eire, and 29.3 per cent were abroad. Of the latter, the greatest concentration (52) was in Canada, 17 were in the United States, 11 were in Australia or New Zealand, and 10 in Africa or Asia.

The data indicated a gradual decrease in numbers leaving the province, from approximately 63 per cent of the 'fifties graduates to approximately 44 per cent of the 1970 graduates, at the time of completing the questionnaire in 1977. The vast majority who left did so within eight years of graduation, and the peak period for emigration was within the first three years. The trends in emigration formed a clear pattern, and one that differed from patterns which emerged from similar studies in Great Britain, suggesting an underlying difference in motivating factors.

The most commonly quoted reasons for leaving the province were professional advancement, greater job satisfaction and greater financial rewards, in that order. The sectarian violence rated eighth on a list of ten factors influencing the decision to leave. The vast majority of voluntary exiles (over seventy per cent) do not plan to return. Only about 3 per cent had definitely decided to return and many of the remaining twenty-five per cent of "possibles" and "probables" said that the decision depended on a satisfactory outcome to our political problems.

The topics which recurred most frequently in the comments made by the respondents were (i) the factors influencing their decision to return to the province and (ii) additional information about their past career.

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THE CHANGING ROLE OF THE OBSTETRIC FLYING SQUAD

by

E. D. GIBSON, J. W. K. RITCHIE, M. J. ARMSTRONG

The Royal Maternity, Jubilee Maternity and Mater Infirmorum Hospitals
and The Queen's University of Belfast

INTRODUCTION

Farquhar Murray (1929) outlined the concept of an obstetric flying squad when, speaking to the Edinburgh Obstetric Society he suggested that there were " . . . . . many conditions in which, instead of rushing a shocked and collapsed patient to hospital for nursing and specialised aid, the specialist and nurse should be rushed to the patient". Consequently the Bellshill Emergency Service commenced officially in 1931 and records of the service are available from 1933. The period 1933-61 was reviewed by Liang (1963) and he concluded that "the main function of such a service is resuscitation and transfusion of the shocked and bleeding patient".

More recently doubts about the relevance of the service have been expressed. In a review of 25 patients admitted by the flying squad in one year in South London (Fergusson and Watson, 1976) it was concluded that few, if any, circumstances in modern obstetric practice merited continuing the flying squad in an urban area. This conclusion was based upon the finding that only 29 per cent of the calls were justifiable. In another small study, James (1977), arguing that the final decision for each flying squad call must lie with the general practitioner on the spot, suggested that this service still had a vital part to play in modern obstetric care. It was admitted however that the flying squad might be slower than a good emergency ambulance service.

The flying squad was discontinued five years ago in Dublin, a city noted in the past for its management of emergency obstetrical problems. The decision reflected changing obstetrical practice and there has apparently been no reason to regret it since (O'Driscoll personal communication). In contrast, as recently as August 1979, the Maternity Services Subcommittee of the General Medical Services Committee of the British Medical Association (1979) was of the opinion that "obstetric flying squads were still necessary in all areas".

A previously unpublished study of the activity of the flying squad in the Belfast area during 1964-69 revealed that there had been an increase in its work despite a reduction in domiciliary midwifery during the same period from 22 per cent to 10 per cent. It appeared that the flying squad was being increasingly used as a safe means of transporting patients to hospital rather than a resuscitative service. Interested by these findings we decided to examine records of all flying squad calls in the Belfast area 1973-78 and review current trends in the service and compare the two periods 1964-69 and 1973-78.

METHODS

The obstetric flying squad in Belfast started in 1943. The service is provided on an alternate week basis by the staff of the Royal Maternity Hospital and the Jubilee

Maternity Hospital. The area covered lies approximately within a 25 mile radius, the majority of calls being within a 10 mile radius.

When a request for the flying squad is received, an ambulance with two officers collects personnel and equipment from the hospital on call. The ambulance is provided from ambulance headquarters and is not itself specially equipped. The equipment is carried to the ambulance pre-packed in cases and boxes and includes resuscitative equipment together with drugs and sterile packs for carrying out deliveries and various operative obstetric procedures. Two units of unmatched group O Negative blood are also taken on each call.

The personnel consists of the duty obstetric registrar (or an experienced senior house officer) and a qualified midwife; a medical student may also go along. A careful record is made of each flying squad call including the source of the request; the nature of the emergency; the time taken from receiving the call till reaching the patient; the name of the general practitioner or district midwife concerned if any; the general condition of the patient on arrival and treatment, if any, rendered by the flying squad staff.

The records for 1964-69 and 1973-78 were carefully analysed and the following information extracted.

RESULTS

A total of 1728 calls were received over the twelve year period under review. Nine hundred and sixty seven of these occurred in the first six years and 761 in the second. The mean number of calls per year has decreased from 161 in the first six years to 125 in the second.

Examination of the source of each call showed that the number of requests made by a general practitioner or midwife has decreased from 81 per cent in the first six years to 54 per cent in the second. In contrast, the number of calls for the flying squad made by ambulance crews already on the spot has increased from 4 per cent to over 20 per cent. There has been a marked decrease in the number of ocacsions on which a general practitioner was present, from 47 per cent in 1973 to 23 per cent in 1978.

The average time taken from receipt of the call till actually reaching the patient was 20 minutes and was similar for both periods studied. The number of patients found to be clinically shocked (systolic blood pressure less than 100 mg Hg) on arrival of the flying squad was almost 30 per cent in 1964-69 (Table I). This has fallen to 11 per cent in the first three years of the second review period (1973-75) and to 7 per cent in the second (1976-78). This reduction is reflected in the percentage of patients requiring blood transfusion, 26 per cent in 1964-69 and only 4 per cent in 1973-78 (Table I).

The reasons for calling the flying squad show interesting trends over the two periods (Table II). Abortion has now superseded complications of the third stage as the commonest emergency. The incidence of calls for retained placenta has decreased gradually from 25 per cent in 1964-69 to 6 per cent in the last three years under review (1976-78). General anaesthetics were administered to 14 per cent of patients in 1973 and to less than one per cent in 1978. During 1973-78 32 per cent of patients required no treatment whatsoever and were simply transported to hospital.

TABLE I

Incidence of Patients Clinically Shocked and requiring Blood Transfusion on arrival of the flying squad

	Percentage of Patients Shocked	*Percentage of Patients given blood transfusion*
1964-69	30%	26%
1973-78	9%	4%

TABLE II

Distribution of Emergencies dealt with by the Flying Squad

	1964-69	1973-78
Third Stage Complications	42%	22%
Abortion	24%	26%
APH	24%	23%
Eclampsia and Pre-eclampsia	1%	2%
Others*	9%	28%

*Others include patients in labour or already delivered at home.

In the same period 17 per cent of all calls were to patients who were either in labour or who had inadvertently been delivered normally at home.

There were two maternal deaths in the 12 years period. During 1964-69 a patient at 22 weeks gestation suddenly collapsed at home and was dead within 20 minutes of the arrival of the flying squad. A post-mortem examination showed that death was due to a massive pulmonary embolus. The second maternal death occurred during the 1973-78 period and involved a 28 year old patient at 15 weeks geatation. On booking at eight weeks amenorrhoea a mass in the epigastrium was noted and a leiomyosarcoma of the stomach was subsequently diagnosed at laparotomy. The patient's condition was very poor post operatively but at her own urgent request she was allowed home although near 'in extremis'; next day her general practitioner called the flying squad because of heavy vaginal bleeding but the patient was dead when the team arrived ten minutes later.

DISCUSSION

The original function of a flying squad was to provide primary resuscitation for women with life-threatening complications of pregnancy and their subsequent safe transport to hospital. This was emphasised by Stabler in 1947 when reviewing the Newcastle-upon-Tyne Obstetric Emergency Service he stated that a shocked

pregnant woman must be saved an ambulance journey if at all possible and that this should be one of the prime objects of an obstetric emergency service.

Our findings show that the function of the flying squad has changed and this reflects the major change in obstetrical practice in Belfast since 1964, viz, fewer domiciliary and GP obstetric unit births. In 1964, 25 per cent of births in this area occurred outside specialist units whereas in 1978 this figure had fallen to 5.7 per cent. Thus in 1978 of 9,765 births to residents in the area served by the flying squad 10 (0.1 per cent) occurred at home and 551 (5.6 per cent) in GP obstetric units (Eastern Health and Social Services Board Statistics, 1978). This change alone has resulted in fewer calls for the flying squad service and in general calls of a less serious nature. The number of calls for third stage complications, once the commonest indication for summoning the flying squad (Fraser and Tatford, 1961) has been halved in the second period. The number of clinically shocked patients with systolic blood pressure of less than 100 mm Hg is now one quarter of that in 1964 and the percentage of patients requiring blood transfusion is now under 4 per cent and less than one sixth of that in 1964. This is in contrast to Liang's (1963) survey covering the years 1933-61 when 56 per cent of patients received blood transfusion.

The average time taken for the flying squad to reach a patient has remained unchanged at 20 minutes. This compares unfavourably with the average time currently taken for an ambulance to reach 999 calls in the Belfast area (less than ten minutes); a similar observation has been made by James (1977). The delay is due to the time taken by the ambulance crew having to collect flying squad personnel and equipment from the hospital before answering the call. It is illogical that while ambulance crews are willing and able to collect patients seriously injured as a result of civil commotion or traffic accidents, by tradition the obstetric flying squad is called for pregnant women with vaginal bleeding even if slight. Valuable time is often wasted during which the patient could have been transported by other means to the maternity hospital. Our ambulance crews have had much experience of quickly transporting shocked patients to hospital in Belfast as a result of civil disturbances over the past ten years (Gordon and Crockard, 1974).

The decreasing involvement of general practitioners in obstetric practice is reflected by the diminished number of calls made by them (81 per cent in 1964-69, 54 per cent in 1976-78) and by the decreasing percentage of calls at which they are present. This may partly explain the fact that nearly one third of flying squad patients over the past six years have required no treatment whatsoever and doubtless many of these could have been adequately managed without the flying squad if they had been seen by a general practitioner. This high number of unjustified calls has been reported in other surveys (Fergusson and Watson, 1976) and they are often made by a relative or neighbour of the patient. This source now accounts for nearly 20 per cent of all calls for the flying squad service. The reduction in planned home deliveries and in GP maternity unit deliveries over the past few years accounts for the marked decrease in calls for third stage complications particularly retained placenta and is reflected in the virtually negligible number of general anaesthetics now required.

In view of the changes which have taken place in obstetrical practice in Belfast and the corresponding reduction in the number of flying squad calls and their less serious nature, there would appear to be little need for an obstetric flying squad in such an

urban setting. Emergency calls to maternity patients could be dealt with by the normal emergency ambulance service which is capable of bringing the patient to hospital more quickly than either the flying squad or a mobile resuscitative unit such as that proposed by Zorab and Baskett (1977).

The emphasis in obstetrical care has moved away from infrequent maternal catastrophies and is now more concerned with the management of the fetus and neonate in danger. Rather than discard an outmoded service it should be brought up to date. It would seem that the time has come to dismantle the maternal flying squad and replace it with a service that could supply the urgent needs of premature and otherwise threatened fetuses and neonates. This could be achieved by the provision of a suitably equipped and staffed ambulance for transfer of women with complicated pregnancies or sick neonates to hospitals with special facilities—a perinatal Flying Squad.

SUMMARY

An analysis of 1,728 calls undertaken by the obstetric flying squad service over two six-year periods between 1964 and 1978 has demonstrated a change in its traditional role. The service has been used increasingly as a means of transport to hospital and is now summoned almost as frequently by a relative of the patient or a member of another ambulance crew as by the general practitioner or midwife. This reflects a decline in the involvement of general practitioners in midwifery and the virtual abolition of home delivery in the Belfast area. Rather than discard this outmoded service, it should be replaced with one which is staffed to provide rapid and safe transport of women and babies who require special hospital facilities—a perinatal flying squad.

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HOSPITAL PAEDIATRICS AND CHILD HEALTH CARE

by

J. M. SAVAGE, D.C.H., M.R.C.P.*

Senior Registrar

Ulster Hospital, Dundonald

THE reasons for referral and admission of children to the Ulster Hospital Dundonald (UHD) during October 1979 were documented in order to examine the present day practice of hospital paediatrics. In comparison to 25 years ago many admissions today are not for acute emergencies but for less life threatening conditions which nevertheless are extremely frightening to the parents. The knowledge that their child is being treated in a unit with special skills in treatment of sick children is often of paramount importance to parents. Children however do not hold paediatricians in such high esteem and prefer to avoid doctors and to be looked after at home. This paper therefore wishes to explore the best role of the hospital paediatrician in treating childhood illnesses and improving child health.

PATIENTS STUDIED

The Ulster Hospital is an Area General Hospital providing a paediatric service to an area including North Down and East Belfast. During a 4-week period in October 1979 a total of 1,286 children were seen at the general paediatric clinics or admitted to the surgical and medical paediatric wards of the hospital (Table 1).

TABLE 1

All Paediatric Medical and Surgical Patients UHD (Oct. 1979)

New medical outpatients	89
Reviewed medical outpatients	567
Cardiac outpatients	26
General medical inpatients	134
Neonates admitted to SBU	57
Surgical outpatients	160
Surgical inpatients	81
Accident and emergency attendances	172
TOTAL	1,286

About half of the 1,286 patients attended for review as outpatients, there were 89 new medical referrals from family doctors, more than 200 children required

*Now Senior Lecturer, Department of Child Health, The Queen's University of Belfast and Consultant Paediatrician, The Royal Belfast Hospital for Sick Children.

inpatient treatment and 172 attended the Accident and Emergency Department. Not included in this figure are approximately 200 more children who attended more specialised clinics including—orthopaedics, plastic surgery, ophthalmology, ENT, child psychiatry and physiotherapy.

Outpatients

(1) *Accident and Emergency Attendances*

There is only one Paediatric Accident and Emergency (A & E) department in Northern Ireland which is at The Royal Belfast Hospital for Sick Children (RBHSC). All other A & E departments deal with both adults and children and this is the case at UHD where 172 children attended during the month under review (Table 2). In fact 122 (71 per cent) attended because of some form of trauma, about half of these were fractures, more than one-third were soft tissue injuries and five had head injuries. Many of the others were true emergencies, including seven children with appendicitis, and a variety of medical problems. Possibly only 10-15 per cent of these children would have been more appropriately seen by a family doctor, e.g. cases of paronychia, chicken pox, mumps or conjunctivitis. Indeed in some cases the fault was not that general practitioners (GPs) were inaccessible but that parents had made no effort to contact them. The acute service provided by GPs in the hospital hinterland would appear to be excellent therefore on the basis of A & E visits. This conclusion is further supported by the fact that over 90 per cent of hospital admissions do not come via the A & E department but are arranged by family doctors directly to the wards.

TABLE 2

Children attending Accident and Emergency Department (UHD) in one month

Trauma	122
Acute surgical conditions	16
Infections	22
Acute medical problems	10
Vaccination site infection	2
TOTAL	172

At the RBHSC A & E department in a similar period (October 1978) 1,601 children were seen, i.e. more than the total number of children attending all departments at UHD. Of these children 64 per cent had suffered some trauma, 25 per cent had acute medical problems and 11 per cent acute surgical problems. Again it can be estimated that about 15 per cent of these children could have been equally well treated by a family doctor. In both A & E departments it could be contended that up to 20 per cent of the children did not require medical treatment at all if one considers, for example, those with minor bruises and insect bites. However parental anxiety over a child is also an important consideration and where this has been allayed an important service has been performed.

(2) *Medical Outpatients—Primary referrals*

New medical referrals to outpatient clinics indicate a different spectrum of disease with respiratory conditions coming top of the list (Table 3). Asthma is a common childhood condition accounting for 21 per cent of new referrals but despite this is rather underdiagnosed by family doctors. Up to 20 per cent of children probably wheeze at some time[1] perhaps 10 per cent having true asthma with recurrent wheezy episodes. History taking is all important in the diagnosis which is often missed simply because doctors do not inquire about a wheeze assuming respiratory symptoms to be infective. In approximately 50 per cent of children referred with other respiratory problems asthma was found to be the true diagnosis. Another group of children were referred because of recurrent respiratory symptoms which were therefore assumed to be asthmatic. Again if history taking is careful these patients are revealed to be having 5 to 6 "colds" per year which is normal for young children especially in areas of poor housing. In both situations unnecessary courses of antibiotics can be avoided if time is spent eliciting the history. Bronchodilators are the treatment of choice for asthma not antibiotics.

Referrals with fits and faints may in fact be slightly under-represented in this list of new referrals (Table 3). In a review of a longer period this would be the second most common cause for referral and certainly this is true over a year at RBHSC medical outpatients.[2] The type of help required by family doctors in this situation is (a) to determine whether genuine fits are occurring and (b) if anticonvulsant treatment is needed. One fit in a child should never mean the individual is labelled epileptic and usually does not indicate the need for prophylactic drugs. Anti-convulsants are indicated for recurrent fits especially in the school age child. There is a widespread belief that a 'brain wave test' will provide all the answers whereas in fact EEGs are notoriously unhelpful in this situation.[3] The frequency of fits is not related to EEG findings. The EEG is most useful in establishing that a fit has definitely occurred, e.g. when an abnormal record is obtained within 24 hours of a suspected convulsion.

TABLE 3

New patients referred to UHD Medical outpatients clinics in one month

Asthma	19	Failure to thrive/weight loss	4
Chest infection	4	Enuresis	4
Recurrent URTI	10	Vomiting/feeding problem	6
Fits and fainting attacks	6	Constipation/encopresis	2
Urinary tract infection	6	Cardiac murmur	2
Developmental delay	4	Non Accidental Injury	2
Lymphadenopathy	2	Unexplaining bruising	2
Acute allergic reaction	3	Other	13
	54		35
	TOTAL = 89		

Only six children with urinary tract infection (UTI) were referred to hospital. It is essential that all children with a UTI have radiological investigation of the urinary tract especially if they are pre-school age. Approximately 20 per cent of children with UTI have underlying vesico-ureteric reflux and those under 5 years are at risk of developing pyelonephritic scarring.[4] If chronic pyelonephritis in childhood could be prevented as many as one-third of adult renal transplants might be avoided.

All children with suspected slow development must be seen in hospital. Those who are in fact normal must be identified as soon as possible to relieve parental anxiety. Once it is established a child has development delay intensive investigation is required to exclude treatable causes such as hypothyroidism. However, by far the most important factor in management is the support offered to the parents in the early months and years which are the most stressful. Much of the anxiety and worry of the parents of handicapped children can be alleviated by expert advice and support rather than by medical treatment. It is therefore important that these children come to hospital as early as possible since the community service for the infant age group is at present inadequate in most areas.

There is little doubt that health visitors, family doctors and school medical officers could achieve as good if not better results than hospital doctors in treating enuretic children. The most important factor in success of treatment is clear informed advice to parents on the aetiology of the problem and the correct use of achievement star cards and buzzer alarms. There is no need for primary enuresis, i.e. enuresis since birth, to be treated in hospital and referral probably only increases parental and patient anxiety.

(3) *Medical Outpatients: Review*

The analysis of follow-up appointments essentially mimics the new referrals, although chronic conditions such as diabetes, mental retardation, gastro-intestinal disease and failure to thrive or grow become more common (Table 4). Mothering and social problems occur as a primary reason for review in only a small number but often are the underlying reasons for review, for example, in asthma or UTI to ensure advice is followed.

Thirty-five per cent of the medical follow-up patients suffer from asthma. The reasons for this large number include failure of junior medical staff to discharge patients, poor patient drug compliance, poor patient attendance to family doctor surgeries and severe disease. The two common mistakes in management are to prescribe intermittent rather than daily year round Intal and failure to elicit the presence of exercise intolerance or early morning and night wheeze. Where these problems exist bronchodilators such as oral salbutamol can be prescribed shortly before exercise, e.g. school sports, or long acting aminophylline compounds may be used to help alleviate night symptoms. In fact many asthmatics may not need to attend hospital regularly if adequate treatment monitoring and follow-up could be ensured by family doctors. In the small percentage with severe symptoms, the development of status asthmaticus can be prevented by outpatient visits for nebulized salbutamol from a face mask before severe attacks are established. This is encouraged for individual patients who have a history of hospital admissions.

A Baby Clinic is held each week at which all babies who have been in the Special Baby Care Unit (SBU) are reviewed. The reasons here are not only that this is

TABLE 4

Medical outpatient follow-up patients UHD (Oct. 1979)

Asthma and respiratory problems	201
Mental retardation and developmental delay	45
Small stature and failure to thrive	17
Headaches and epilepsy	50
Gastro-intestinal disorder	31
Diabetes and endocrine (38 + 5)	43
Urinary tract and enuresis (27 + 11)	38
Cardiac murmurs	5
Haematological disorders	6
Mothering and social problems	11
Baby clinic (SBU follow-up)	115
Other	5
TOTAL	567

developmentally an at risk group, but also to support mothers in a situation where the natural bonding process has been interrupted. Valuable feedback and criticism of the paediatric, maternity and community service is often offered and this invariably points towards the feeling of being overwhelmed as a person in the obstetric system. The removal of the longed for and cherished newborn to the sterile SBU occasionally is the last straw. The paediatrician is constantly reminded of the emotional vulnerability of the postnatal mother and the need for special compassion for the baby's mother who is also a patient.

(4) *Surgical Outpatients*

Of 180 surgical outpatients 67 attended for post-operative review. There were 88 new referrals, 23 had umbilical or inguinal hernias, 24 undescended testes or hydrocoeles and eight were thought to be in need of circumcision. There were 11 children with abdominal pain or symptoms related to the gastrointestinal tract, the remaining seven had urological problems.

Admissions

The treatment of acutely ill children in hospital reduces mortality, reduces morbidity by ensuring rapid recovery and further aims to prevent recurrence. Most hospital inpatients do not suffer from rare or strange disease (Table 5) and examination of mortality figures for Northern Ireland suggests that children do not die of rare conditions. Seventy five per cent of deaths are in the first year of life and 70 per cent of these are due to perinatal problems or congenital anomalies. Twenty per cent of deaths are due to infectious disease most commonly pneumonia and 11 per cent due to accidents.[5] In the month under review six children died in UHD. All but one of these children had major congenital anomalies, the remaining child died of viral encephalitis.

TABLE 5

General paediatric admissions in one month to UHD

Medical		*Neonates (SBU)*	
Respiratory tract infection	47	6 physiological	
Asthma	27	Jaundice 3 prematurity	10
Neurological (mainly fits)	17	1 ABO incompatability	
Renal	6	Neonatal asphyxia/low apgar score	8
Feeding and GIT problems	17	Foetal distress	5
Accidental poisoning	4	Instrumental delivery	5
Diabetes	5	IRDS	7
Other	11	Cyanotic attacks	6
		Feeding problems/vomiting	2
TOTAL	134	Meconium aspiration syndrome	1
		Other	13
		TOTAL	57
Surgical			
Orthopaedic procedures	23		
Abdominal and GIT conditions	28		
Genito-urinary problems	15		
Miscellaneous	15		
TOTAL	81	GRAND TOTAL	272

Neonates

The reasons for admission to the SBU are indicated in Table 5. The mother invariably feels she is somehow at fault and has failed the baby. The SBU sister visits mothers in the ward daily and medical staff more intermittently. Mothers are officially encouraged to visit the baby frequently and to feed their baby where possible. Many of the babies in the miscellaneous group of 13 at the bottom of the column are only admitted overnight as a precautionary measure. All the jaundiced babies required only phototherapy as treatment. In one case of neonatal asphyxia the clinical condition of the baby was such as to raise serious worries about its future development. Three required transfer to Royal Maternity Hospital (RMH) Neonatal Unit for ventilation because of severe respiratory distress. The policy would be towards early transfer to the RMH where need for respiratory support seems a possibility. The absence of Rhesus disease in the tables reflects the decreasing incidence of the condition as a result of successful prophylaxis. There is also a policy of transferring mothers before delivery to a specialist centre rather than sick 'rhesus' neonates after delivery whenever such a situation is forseeable.

Infants and Children

The paediatrician's work is more and more geared not so much towards treating children in hospital as to treating children as outpatients and advising on their

treatment so that admission is not required. Reasons for admission and the number of admissions has a marked seasonal variation, although as always in paediatrics, respiratory conditions predominate (Table 5). Fits are the next most common medical cause of admission. Usually children with a fit are rushed straight to hospital bypassing the family doctor. When a family doctor is called he is faced with the dilemma as to how to stop the fit. It is often difficult even in hospital to administer intravenous (IV) diazepam to a fitting child with the help of nurses, bright light and 'butterfly' needles. At home such a technique with its attendant risk of temporary respiratory arrest is almost impossible. If diazepam for injection is administered in the same dose rectally it will be almost as effective as if administered IV. Given intramuscularly (IM) it is useless, paraldehyde is probably the drug of choice by the IM route and is almost as effective as IV diazepam.

In the Ulster Hospital accommodation for mothers is available. This is often useful when we feel the reason for a baby failing to thrive, sleep or feed is poor mothering technique. The problem seems to occur most commonly with first babies and when mothers receive conflicting advice. The success rate is virtually 100 per cent in managing this problem, because a team of nurses who specialise in treating such infants exists and takes pride in the solving of these difficulties.

In the month there were 81 paediatric surgical admissions (Table 5), a considerable proportion of which were for cold orthopaedic procedures. The commonest acute abdominal condition was appendicitis while similar numbers of patients had inguinal hernias repaired. Orchidopexy and circumcision were the most frequent genito-urinary operations.

DISCUSSION

The numbers of children who attend and are admitted to hospital seems to indicate that paediatric specialists continue to be needed to provide adequate child health care. However, as has been suggested, many of the patients attend hospital not because treatment of their condition needs the technology available only in hospital but rather because they are managed there by professionals with skill and experience in treating children. Hospital admission of many children may be related more to social deprivation and standard of family accommodation than to severity of illness. In this situation the hospital has become an extension of the community medical service.

It appears from our comparison of hospital deaths in children and the Registrar General's lists of causes of death that many deaths occurring outside hospital are preventable e.g. pneumonia, gastroenteritis, accidental death. This may indicate the need for greater community involvement by paediatricians. Similarly many of the conditions causing hospital admission and frequent attendances at hospital outpatients e.g asthma, respiratory infection, feeding problems, could be reduced by action at the community level.

The stark figures presented do not reveal the social and environmental causes of unnecessary morbidity and mortality in children. Such causes are at present outside the professional responsibility of paediatricians. To reduce the incidence of accidents and infection for example, would involve the provision of better housing, better road planning and adequate safe play areas for children. Paediatricians can

apply pressure to achieve changes in these areas much as adult physicians have done in relation to smoking and cancer or heart disease.[6] Paediatricians may also need to become more involved in the education of parents and future parents regarding child care as the normal education system does not adequately train teenagers in this area.

The need for skilled hospital care with the advantages of modern technology continues to be essential for the treatment of children with life threatening disease but to reduce morbidity and mortality, the role of the paediatrician will in future demand greater involvement at a community level and in influencing political decisions if there is to be further improvement in child health.

SUMMARY

The reasons for attendance and admission of 1286 children to an area general hospital are examined in detail. Admissions accounted for 272 children, 172 attended the Accident and Emergency department and the remainder visited the general medical and surgical outpatient clinics. Comparison between hospital and community morbidity and mortality are made. While skilled hospital care with the advantages of modern technology are essential for the treatment of severe life threatening disease in childhood, it is suggested that paediatricians in future will need to become more involved at a community level and in influencing political decisions if there is to be further improvement in child health.

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THE 5-YEAR PROGNOSIS FOR VISION IN DIABETES

by

A. L. T. BLAIR, D. R. HADDEN, J. A. WEAVER, D. B. ARCHER, P. B. JOHNSTON, C. J. F. MAGUIRE

Diabetic and Diabetic Eye Clinics
Royal Victoria Hospital, Belfast

DIABETIC retinopathy is a common cause of blindness. The introduction of photocoagulation treatment has stimulated interest in this condition and several well designed and properly controlled studies have shown that either xenon arc or argon laser photocoagulation therapy can arrest or delay the progression of diabetic retinopathy.[1-7] This treatment is now available at many centres in the UK, and the time has come to assess its impact on the overall expectation for vision in diabetics. This paper reports the natural history of visual acuity in a selected group of diabetic patients observed for at least five years. Photocoagulation therapy was performed when indicated, as were other specific ophthalmic procedures.

PATIENTS AND METHODS

The combined Diabetic/Eye Clinic at the Royal Victoria Hospital, Belfast, was established in 1972 as a referral centre for diabetic patients with ophthalmic disease in Northern Ireland. Patients have been referred to this clinic in several ways. The majority were routine referrals from the Diabetic Clinic at the Royal Victoria Hospital, for detailed fundus examination, photographic documentation and fluorescein angiography. Only those patients who had diabetes for more than 10 years are included in this particular study. Patients from the RVH or other hospital diabetic clinics and occasionally from family doctors were also referred for specific ophthalmic reasons, e.g., loss of vision. Consultant ophthalmologists in other hospitals have also referred patients for specialist advice and treatment—these tended to be only the more severe cases.

Visual functions were recorded and detailed ophthalmological examination undertaken after dilatation of the pupils (phenylephrine 10 per cent, cyclopentolate 1 per cent) at each visit. Fluorescein angiography was performed if necessary. The ocular fundi were photographically documented (standard fields). The retinal appearances were classified as "no retinopathy", "background retinopathy" (microaneurysms, haemorrhages and exudates without macular involvement) and "severe retinopathy" (proliferative vasculopathy or exudative maculopathy). The best corrected visual acuity using a Snellen chart was recorded at each visit by trained nursing personnel under medical supervision. Argon laser photocoagulation treatment was given for proliferative vasculopathy, either directly to new vessel formations if remote from the mascula or optic disc, or indirectly by more generalised retinal ablation, especially in optic disc proliferation. In exudative maculopathy direct treatment was given to microvascular abnormalities associated with exudative lesions at the posterior pole, identified by fluorescein angiography or seen at the centre of circinate patterns.

Data on blood glucose control during the entire diabetic history of each patient was not available, as many had come from other hospitals. For those for whom complete or nearly complete documentation of two hour postprandial venous blood glucose values were available from the onset of diabetes, it was possible to calculate a mean and standard deviation of blood glucose for each patient. This was possible in view of the relatively large number of observations: it has been the practice in several clinics in Northern Ireland to measure postprandial venous blood glucose in diabetic patients for many years.

RESULTS

Between 1972 and 1979 we examined 1157 patients at the Diabetic Eye Clinic. Fifty-two of these patients died before 1979 and 79 are no longer attending the Clinic, 1026 patients remain under regular review. The life expectancy of these

TABLE I

Diabetic Eye Clinic, Royal Victoria Hospital, Belfast

Patients attending November 1972—August 1979

	Still Attending	*Not Attending*	*Died*	*Photocoagulation treatment*
Severe Retinopathy	145	28	28	142
Background Retinopathy	453	18	15	126
No Retinopathy	401	33	6	—
Others/unclassified	27	0	3	4
	1026	79	52	272

TABLE II

Classification on Ophthalmic Assessment: Patients observed over 5 years

	Mean Age at Classification (±SD)	*Mean Duration of Diabetes (±SD)*	*Therapy*	
			Insulin %	*Diet/OHA %*
Severe retinopathy (40 patients)	47 ± 15	18 ± 7	83	17
Background retinopathy (33 patients)	55 ± 14	16 ± 12	76	24
No retinopathy (32 patients)	42 ± 17	12 ± 10	81	19

OHA—Oral hypoglycaemic agent.

patients has been analysed separately.[8] Two hundred and seventy two patients have received photocoagulation treatments between November 1972 and August 1979 (Table I). We have now continued observation of 105 of these patients for at least five years. The ophthalmological classification in this subgroup at the initial examination showed no retinopathy in 32, simple background retinopathy in 33 and severe retinopathy in 40 (Table II). The mean age and mean duration of diabetes at classification were not significantly different. The great majority of patients were on insulin treatment. Blood glucose data was available for 23 of the no retinopathy group, 21 of the background retinopathy group and 27 of the severe retinopathy group, who had attended the RVH diabetic clinic.

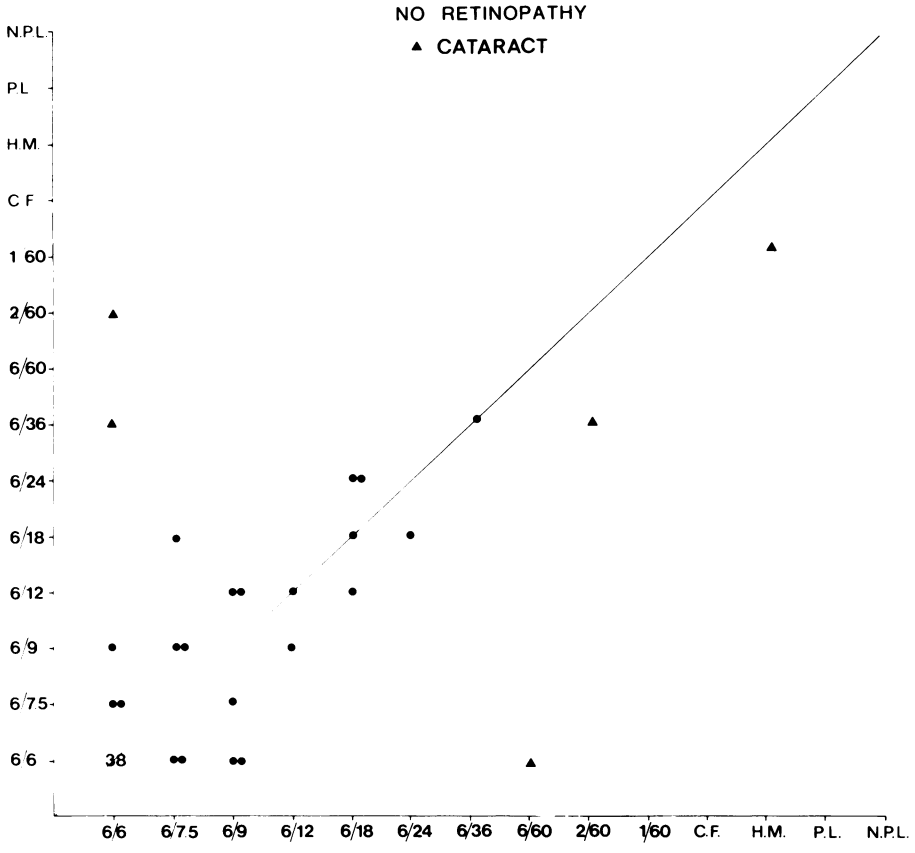

Figure 1. *Initial visual acuity on vertical axis: Visual acuity at 5 years on horizontal axis. Each circle or triangle represents one eye. Open circles indicate eyes photocoagulated. Numbers indicate numbers of eyes. Diagonal line represents no change in visual acuity over 5 years.*

CF = counting fingers HM = hand movements
PL = perception of light NPL = no perception of light

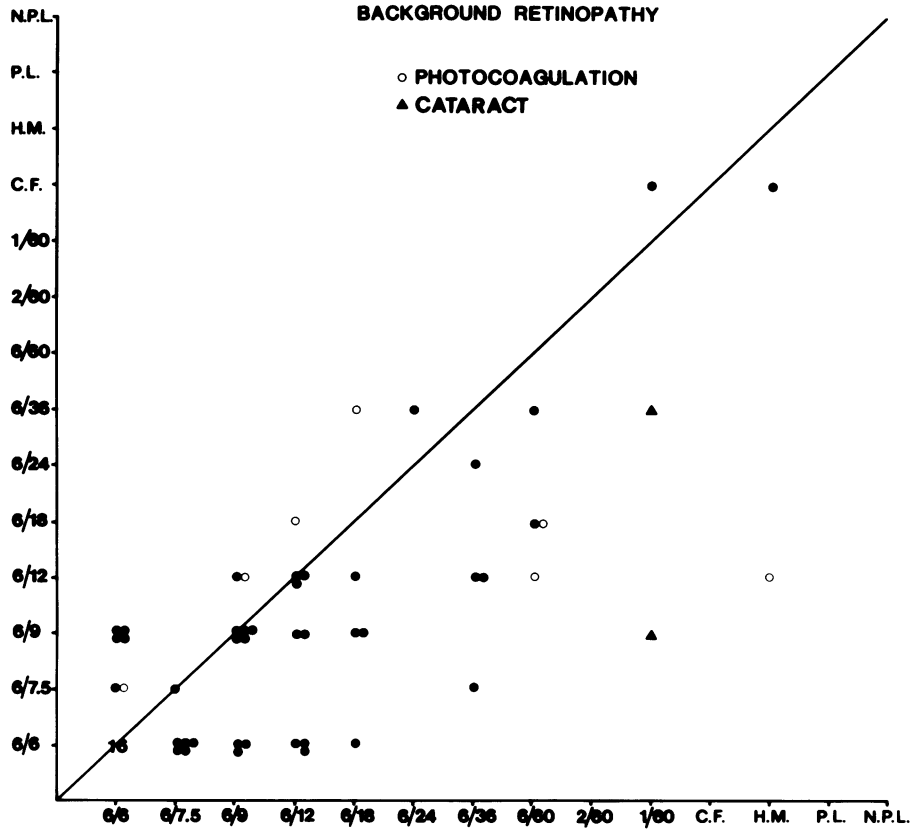

Figure 2. *Initial visual acuity on vertical axis: Visual acuity at 5 years on horizontal axis. Each circle or triangle represents one eye. Open circles indicate eyes photocoagulated. Numbers indicate numbers of eyes. Diagonal line represents no change in visual acuity over 5 years.*

CF = counting fingers HM = hand movements
PL = perception of light NPL = no perception of light

TABLE III

5 Year Prognosis for Vision: Individual Eyes

(a change of 2 lines in the Snellen chart was necessary for change in visual assessment)

Visual Assessment	*Severe Retinopathy*	*Background Retinopathy*	*No Retinopathy*
Same	25 (31%)	43 (65%)	55 (86%)
Better	10 (13%)	5 (8%)	4 (6%)
Worse	45 (56%)	18 (27%)	5 (8%)
	80	66	64

The visual acuity at the initial assessment compared to that at five years later for the three subgroups is plotted in Figures 1, 2 and 3 and analysed in Table III. Considering individual eyes there were 64 with no retinopathy, 66 with background retinopathy and 80 with severe retinopathy (Table III). Visual acuity deteriorated over the five years in five eyes (8 per cent) that were initially classified as no retinopathy due to the development of cataracts. In the background retinopathy group visual acuity deteriorated in 18 (27 per cent) of the eyes—in the majority due to the development of macular exudates, only a few eyes developing new vessels. Forty-three (65 per cent) of eyes initially classified as background retinopathy remained unchanged over five years. In the severe retinopathy group visual acuity

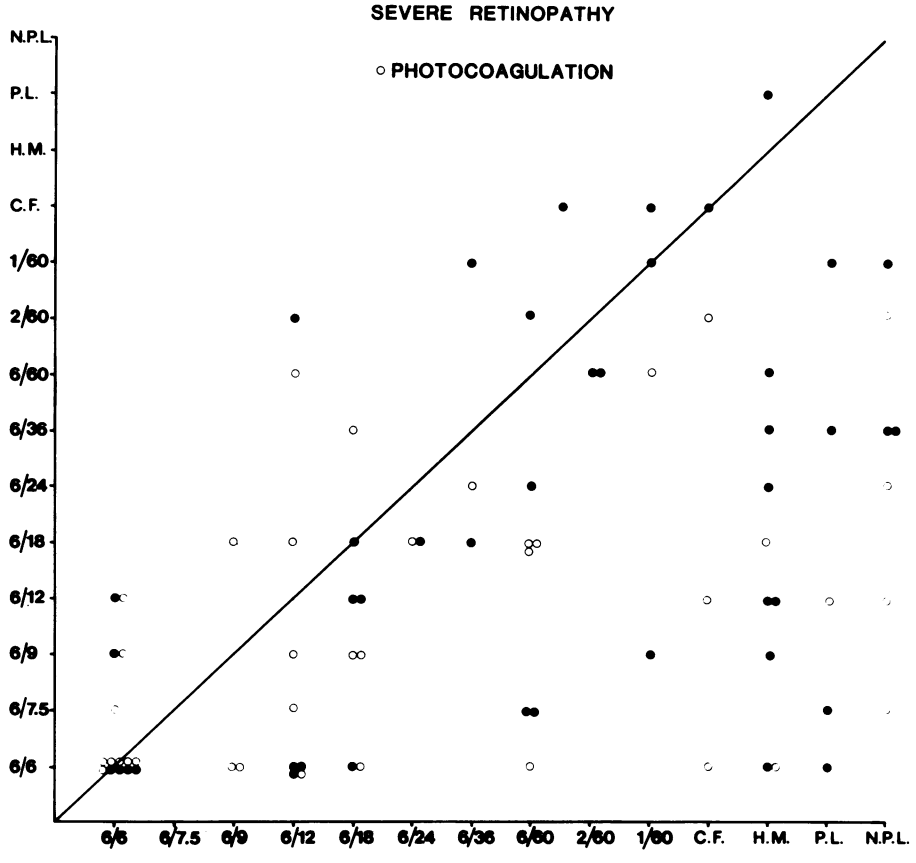

Figure 3. *Initial visual acuity on vertical axis: Visual acuity at 5 years on horizontal axis. Each circle or triangle represents one eye. Open circles indicate eyes photocoagulated. Numbers indicate numbers of eyes. Diagonal line represents no change in visual acuity over 5 years.*

CF = counting fingers
HM = hand movements
PL = perception of light
NPL = no perception of light

TABLE IV

Risk Factors for Visual Deterioration in Severe Retinopathy

	Age (±SD)	*Duration of Diabetes (±SD)*	*Therapy*		*BP Mean*
			Insulin %	*OHA %*	
Poor visual acuity (<6/60) at year 0	53 (±13.2)	17.5 (±9.8)	58	42	153/90
Deterioration in visual acuity to <6/60 in 5 years	44.4 (±15.2)	16.4 (±7.9)	88	12	139/87
No change in visual acuity (>6/60) over 5 years	44.4 (±14.5)	18.7 (±3.1)	86	14	141/79

OHA—Oral hypoglycaemic agent.

TABLE V

Relation of 2-3 hour postprandial venous blood glucose levels in the long term to the presence of diabetic retinopathy

	No Retinopathy	*Background*	*Severe*
Number	33	21	27
Age at onset	32	28	35
Present age	47	46	54
Duration of diabetes	15	19	20
Mean total number of recorded blood glucose per patient	70	102	69
Average number of blood glucose per year of follow up	6	6	4
Mean recorded blood glucose (±SD) since first attendance mmol/1	9.4 ± 4.8	10.1 ± 5.4	10.1 ± 4.8

deteriorated in 45 eyes (56 per cent) over five years, remained unchanged in 25 (31 per cent) and improved in 10 (13 per cent). Extensive neovascularization and its sequelae was responsible for deterioration in the majority of the severe retinopathy group. A change of two lines on the Snellen chart in the five years was necessary for this analysis. Seven eyes (11 per cent) received argon laser photocoagulation therapy in the "background" group, 38 (48 per cent) in the "severe" group.

Age, and duration of diabetes, or the need for insulin therapy were not different in those patients whose vision deteriorated (Table IV). The mean blood pressure in those patients whose vision deteriorated was not significantly different from those whose vision did not change. For the patients for whom documentation of outpatient blood glucose values was possible, the mean ± standard deviation of the recorded 2 hour postprandial blood glucose values are shown in Table V. The mean ages and duration of diabetes for these subgroups are somewhat different from those of the complete data. An average of between 69 and 102 blood glucose values were available for these three subgroups, obtained at routine outpatient reviews—this gave an average of four to six values annually. The mean recorded blood glucose from the time of first diagnosis for those in the no retinopathy group was 9.4 mmol/1, for the background retinopathy group 10.0 mmol/1 and for the severe retinopathy group 10.0 mmol/1.

DISCUSSION

The prognosis for vision in diabetics with established severe retinopathy is poor, but has improved since the introduction of photocoagulation treatment. Several trials[1-4] have demonstrated the effectiveness of this therapy in modifying the progress of proliferative retinopathy and exudative maculopathy. There was no difference in antidiabetic therapy or duration of diabetes in our patients whose vision deteriorated compared with those whose vision remained unchanges or improved.

In the absence of a fully prospective study of the development of retinopathy in relation to blood glucose control, it is relevant to observe even the partial documentation which is available in our hospital records. The tradition of measuring outpatient 2-3 hour postprandial venous blood glucose values under supervision has continued for many years in Northern Ireland, and we feel that the incomplete data presented in Table V at least merits inspection. None of the three groups achieved what might be called good control of their observed blood glucose values, but equally, those with the severe retinopathy did not have the highest mean blood glucose value. The studies of Job et al[9] and Ashikaga et al[10] have not resolved the question of whether or not diabetic control affects the development or progress of retinopathy.[11, 12]

Coagulation abnormalities secondary to the abnormal metabolic state in diabetes may be a factor in diabetic retinopathy.[13, 14] The elevated levels of glycosylated haemoglobins found in diabetics with 'bad' control[15] may be associated with tissue hypoxia.[16] In an associated study in Belfast Elder et al[13] did not confirm the presence of a hypercoagulable state in diabetic patients with retinopathy. Rather than a specific or primary increase in one of the many coagulation factors, they found a generalised increase in both coagulation and fibrinolytic elements of the blood clotting mechanism, and felt that these changes were more likely to be secondary to the presence of microvascular disease.

Smoking may be a risk factor for proliferative retinopathy,[17] but we did not investigate this in detail. A greater prevalence of visual deterioration was found among non-smokers in this study, but there may be many reasons for this unexpected finding. The assessment of smoking habits was by simple verbal

questioning at non-standardised times, and it is recognised that as vision deteriorates, many smokers tend to discontinue the habit.

If it is accepted that early detection and treatment of diabetic retinopathy can arrest deterioration of visual acuity, consideration must be given to the staffing of specialised diabetic ophthalmic clinics. From the data at the RVH diabetic clinic of 2200 patients it is estimated that there are about 30 patients with 'severe' retinopathy per 1000 patients attending. Donovan[18] had found a much higher prevalence of 11.6 per cent 'severe' retinopathy in patients attending a diabetic clinic at a district general hospital. The relatively inefficient fundus examination possible through undilated pupils at a diabetic clinic may pick up early retinal disease, but our policy is to obtain detailed ophthalmological examinations in all insulin-requiring diabetics of 10 years duration or where patients present at any time with symptoms of disturbed vision. Only detailed examination of this type can allow accurate assessment of clinical severity.

SUMMARY AND CONCLUSIONS

A group of 105 diabetic patients, 32 of whom had no detectable retinopathy, 33 simple background retinopathy and 40 of whom had severe retinopathy were observed over five years with specialist ophthalmic supervision. In 146 eyes with retinopathy 68 (46.6 per cent) remained unchanged, 61 (41.8 per cent) deteriorated and 17 (11.6 per cent) improved during the five years; those graded as severe retinopathy at initial assessment deteriorated most. Age and duration of diabetes, or the need for insulin therapy were not different in those patients whose vision deteriorated. Hypertension was rare. Assessment of available recorded blood glucose values in some of these patients suggested that ideal control of the blood glucose had not been achieved in any of the three groups classified by severity of the retinopathy: neither did those with the most severe retinopathy have the highest mean recorded blood glucose values.

The five year prognosis for vision in this diabetic population was relatively good. Only a small proportion of diabetics develop severe retinopathy. Vision in this group may deteriorate in spite of photocoagulation treatment.

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PREVENTION OF RHESUS (D) IMMUNISATION— Some Causes of Failure in Northern Ireland

by

W. M. McCLELLAND, M.B., M.R.C.Path.
K. G. McLOUGHLIN, F.I.M.L.S.

Northern Ireland Blood Transfusion Service, Belfast

INTRODUCTION

DURING the past decade there has been a dramatic fall in the incidence and mortality from Rh haemolytic disease (Tovey 1976; Magee, Harley, Campbell and McClure, 1969-78). This is due to two factors, firstly the appreciable fall in the number of Rh (D) negative women having babies, particularly if they had developed Rh antibodies previously; and secondly the routine administration of anti-D immunoglobulin to Rh (D) negative women delivered of Rh (D) positive infants. This prophylactic programme is aimed at prevention of Rh (D) immunisation, because once this occurs, there is a serious risk of haemolytic disease in any Rh (D) positive baby and this tends to become progressively more severe with increasing mortality in subsequent pregnancies (Walker, Murray and Russell, 1957). Recently it has become apparent that the decline in the incidence of Rh (D) immunisation has halted, and that a significant number of Rh (D) negative women still develop anti-D as a result of pregnancy. We present the results of an investigation into the causes of the problem in Northern Ireland and discuss the measures required to solve it.

PATIENTS AND METHODS

The routine prophylactic programme in Northern Ireland as in the rest of the United Kingdom is to administer 100 ug anti-D immunoglobulin to all Rh (D) negative women who have given birth to a Rh (D) positive baby within three days of delivery. A larger dose is given to the small number of women who have a transplacental fetal haemorrhage of greater than 4 ml as determined by the Kleihauer technique. It is also recommended in the United Kingdom that all Rh (D) negative women should receive anti-D immunoglobulin following an abortion, (Standing Medical Advisory Committee, 1976). All ante-natal patients in the province are tested for the presence of irregular antibodies by the Northern Ireland Blood Transfusion Service and Rh (D) negative cases are tested at least three times during each pregnancy. All samples are tested manually using saline, albumen, enzyme and indirect Coomb's techniques.

During 1978-1979 anti-D was detected in 117 ante-natal patients. Of these there were 50 patients in whom anti-D was detectable for the first time and it was decided to analyse these patients for possible causes of sensitisation. The obstetric history was obtained and details of all previous pregnancies, including those ending in abortion, taken from the original notes. The following information was particularly noted; the baby's Rh (D) group (where appropriate), result of Kleihauer test, record of anti-D administration (including the dose) and history of blood transfusion. If any of the information was not recorded in the case notes it was obtained from the laboratory responsible for performing the tests and issuing anti-D immunoglobulin.

RESULTS

No cases had a history of transfusion with Rh (D) positive blood. Nineteen patients had been pregnant before 1969 (when anti-D prophylaxis first became available) and were excluded from the analysis. In one patient, who had a previous pregnancy in a different country, the cause of sensitisation remains uncertain, but the remaining cases were divided into three categories:-

1. *Failure of Administration*

   There were 11 patients in this category, which included those patients who failed to receive anti-D immunoglobulin, following a previous normal delivery of a Rh (D) positive baby (two cases) or following an abortion (nine cases). Of the latter, the previous abortion had almost certainly been the cause of sensitisation in six cases, but this was less certain in the remaining three.

2. *Failure of Treatment*

   There were 17 patients in this category, all of whom had a record of having received anti-D immunoglobulin where appropriate. The result of the Kleihauer test was recorded in each of these cases and in three patients this indicated the presence of a large transplacental haemorrhage. In none of these cases was anti-D given in a dose pro-rata with the calculated volume of fetal cells which is the method recommended (Wagstaff, 1978). Instead an arbitrary number of extra doses of anti-D were given daily until fetal cells could no longer be demonstrated in the maternal blood. In at least two of these cases this inadequate treatment was clearly the cause of sensitisation.

3. *Primigravidae*

   In only two cases were antibodies detected during a first pregnancy.

In category 1 all patients produced antibodies early in pregnancy with the exception of two cases. The antibody detected was usually of high potency. Five of the babies in this category required an exchange transfusion and there were no deaths. In categories 2 and 3 (with one exception) the antibody only became detectable in the last trimester of pregnancy. The antibody was invariably weak, often being detectable by an enzyme method only, and none of the babies had an exchange transfusion. There was one neonatal death, but this was unrelated to haemolytic disease.

DISCUSSION

It is well established that small transplacental haemorrhages can occur during pregnancy sufficient in amount to cause sensitisation to blood group antigens, especially in the last trimester (Bowman, Chown, Lewis and Pollock, 1978; Cook, 1979). This is clearly the case in primigravidae though only two cases were detected during the two year period under examination. The antibodies found in primigravidae are always very weak and the number detected tends to be higher if the more recently developed auto-analysis techniques are used for antibody detection. Those patients who received adequate prophylaxis for all previous

pregnancies are also likely to have been sensitised during the current pregnancy. In these cases the antibody is not likely to be detected until the last trimester (this was the case in all but one patient). It was occasionally difficult to be sure that patients who failed to receive anti-D immunoglobulin when indicated were sensitised as a result, especially following abortions which are less likely to cause sensitisation than a normal delivery. However, in all except two cases who had failed to receive anti-D prophylaxis when indicated, antibody was detected early in the current pregnancy, indicating that sensitisation must have occurred as a result of a preceeding pregnancy. It can be seen that the stage in pregnancy when antibody first appears provides a clue to the cause of sensitisation.

Only two cases were sensitised as a result of failing to receive anti-D immunoglobulin following a previous normal delivery. Both of these patients had been delivered at home, a factor in favour of hospital delivery. Attention has been drawn to the fact that some failures of administration following normal delivery are due to the baby being grouped wrongly as Rh (D) negative (Tovey, Murray, Stephenson and Taverner, 1978). This problem, which did not apply in our two cases, could be solved by administering anti-D immunoglobulin to every Rh (D) negative mother at delivery irrespective of the baby's Rh (D) group.

It is well recognised that spontaneous abortion in Rh (D) negative women causes sensitisation in about 3-4 per cent of cases (Freda, Gorman, Galen and Treacy, 1970; Tovey, 1979) and this can be prevented by the administration of 50 /ug anti-D immunoglobulin (Simonovits, 1979). Our findings confirm the importance of anti-D prophylaxis following abortion, but at the time of writing this is not routine practice in Northern Ireland (with the exception of a few units). It is essential to obtain the blood group from all women who are aborting, and if this is Rh (D) negative, to administer 50 /ug anti-D immunoglobulin if the abortion is at 20 weeks gestation or less, and 100 /ug if over 20 weeks. It will obviously be difficult to cover all these cases as the mother (or her doctor) may sometimes be unaware she is aborting. We are planning to issue a special card to all Rh (D) negative expectant mothers drawing attention to the need for anti-D immunoglobulin administration following normal delivery and abortion.

In no case had there been a failure to carry out a Kleihauer test following a previous normal delivery, but it does appear that some patients with large transplacental haemorrhages are not managed in the recommended way (Wagstaff, 1978) and that this led to sensitisation in at least two cases.

The majority of cases represent failures of treatment and could not have been prevented by the currently recommended regime. These cases were presumably due to ante-natal sensitisation and there is evidence that this can be almost entirely prevented by ante-natal administration of anti-D immunoglobulin (McMaster Conference, 1979). This programme would involve the administration of 100 /ug anti-D immunoglobulin to all Rh (D) negative women on two separate occasions during the last trimester and would be in addition to the existing post-natal prophylaxis. Clearly this practice would involve a massive increase in requirements for anti-D and place a considerable strain on transfusion centres. The cost benefit in the United Kingdom as a whole has been questioned although a pilot study is in progress. It has been stated that there is a stronger case for ante-natal prophylaxis in countries with a high birth rate and where effective birth control is not practised by

those already immunised (McMaster Conference, 1979). This suggests that Northern Ireland might obtain greater cost benefit than the rest of the United Kingdom. In contrast to our findings a survey of first-affected cases in Yorkshire showed a slight majority were due to "failure of administration" (Tovey, 1978). This difference appears to be mainly due to their higher incidence of failure to cover appropriate normal deliveries.

As would be expected in first-affected cases, few of the babies in the group under analysis were severely affected by haemolytic disease. There were no deaths attributable to the presence of Rh (D) antibodies and only 5 out of 31 babies required exchange transfusions. The latter all occurred in the "failure of administration" category which is not surprising in view of the much more potent antibodies found therein. The absence of any severely affected cases in the "failure of treatment" category or in primigravidae is in agreement with other workers (Tovey, 1979). This observation has been used as an argument against the introduction of ante-natal prophylaxis, but once Rh (D) immunisation occurs there remains the much greater risk to the baby in subsequent pregnancies.

SUMMARY

It is gratifying that very few Rh (D) negative mothers fail to receive anti-D immunoglobulin following the normal delivery of a Rh (D) positive baby, but it does seem that this could be reduced even further by discouraging home delivery. The incidence of sensitisation could also be reduced by the routine use of prophylactic anti-D for abortions in all Rh (D) negative women, and possibly by the better management of large transplacental haemorrhages following normal delivery. Further improvement will only be obtained by the introduction of anti-D prophylaxis during the ante-natal period.

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A CASE OF GARDNER'S SYNDROME

by

C. J. H. LOGAN and J. M. SLOAN

The Ulster Hospital, Dundonald, Belfast
and
Pathology Department, Royal Victoria Hospital, Belfast

THE association of multiple adenomatous polypi of the large intestine, osteomas of the skull and facial bones, subcutaneous fibromatous tumours and epidermoid cysts was recognised by Gardner and Richards in 1953. The condition shows autosomal dominant inheritance. Since then the syndrome has been enlarged and several additional features have been recorded (Morson and Dawson, 1979).

CASE REPORT

The patient is a young woman who was first seen at the Ulster Hospital in 1968 when she was aged 11 years. She was found to have hard swellings behind her right ear and behind the sterno-mastoid process on the right side. A tonsillar lymph gland was palpable on the right side but there was no other lymphadenopathy.

The patient was subsequently admitted to hospital in 1972 for investigation of subcutaneous swellings of her neck and back. A total of seven swellings were found in the regions of the right scapula, left shoulder, neck and upper chest wall. There was no lymphadenopathy. Biopsy of these swellings showed the features of benign calcifying epithelioma of Malherbe.

Further questioning revealed that the patient was delivered by Caesarean section in the 36th week of pregnancy because her mother had developed intestinal obstruction. Laparotomy performed at the same time showed the presence of multiple peritoneal secondary deposits. The patient's grandmother, two of her uncles and one aunt had died of bowel cancer. This family history together with the presence of skin tumours suggested a diagnosis of Gardner's syndrome and further investigation along these lines was carried out. At the time of her first admission to hospital in 1972 no sign of polyposis was seen at sigmoidoscopy but there was suspicion of multiple polypi on the barium enema examination and on barium meal and follow-through a few small lucent areas were noted in the small bowel suggestive of polypi.

At sigmoidoscopy six months later (March, 1973) many minute polypi and one large polyp measuring 1 × 2cm were seen. Histological examination showed that these were benign adenomatous polypi. Several more were discovered during 1973 and 1974, the largest being 1.5 × 1cm. Barium enema carried out in September 1974 showed only a small polyp in the ascending colon but the haemoglobin was noted to have fallen over the previous year. In view of the possibility of malignant change in polypi in Gardner's syndrome it was decided that she should have a prophylactic colectomy. This was carried out in 1974 and the terminal ileum was anastomosed to the rectum just below the peritoneal reflection. Examination of the specimen showed the presence of several colonic polypi of varying sizes, the two largest

measured 3 × 3.5cm and 2 × 1.5cm. Histological examination of these lesions showed that both contained areas of well differentiated adenocarcinoma. In one tumour cells had penetrated the muscle wall and were present at the serosal surface but local lymph nodes were not involved (Dukes type B). In the other the tumour was limited to the intestinal wall (Dukes type A). Examination of smaller polypi showed the features of adenomatous polypi but no frank carcinoma.

Follow-up continued with regular sigmoidscopic examinations and in November 1975 a 0.75cm diameter benign adenomatous polyp was removed by diathermy.

In November 1977 the patient was found to have a hard mass arising in the pelvis which was separate from the uterus. At laparotomy a large tumour was found in the mesentery of the small bowel arising over the right ureter at the brim of the pelvis. 30cm of terminal ileum were excised together with the tumour mass (Fig. 1) and a new ileo-rectal anastomosis was fashioned. A similar but smaller tumour was felt in the mesentery of the jejunum. The excised tumour was circumscribed and measured 13cm in diameter. It arose in the mesentery and was bounded by a loop of small bowel. Histologically the tumour was composed of mature fibrous tissue showing little evidence of mitotic activity or pleomorphism and the features were consistent with mesenteric fibromatosis. The ileal mucosa was studded by numerous tiny polypi measuring 2mm in diameter or less (Fig. 2). Several of these were examined histologically and all proved to be benign lymphoid polypi composed of lymphoid tissue often with germinal follicle formation.

Further sigmoidoscopies have been carried out at regular intervals. In July 1979 a hard mass was felt underneath the colectomy scar. This was thought to be a carcinomatous deposit and was excised. It proved to be a 2.5cm diameter tumour within the anterior abdominal wall and histological examination showed it to be a further fibromatous lesion consistent with a desmoid tumour. The patient was also noted to be slightly icteric at this time (bilirubin 36 μ mol/l. A liver scan showed

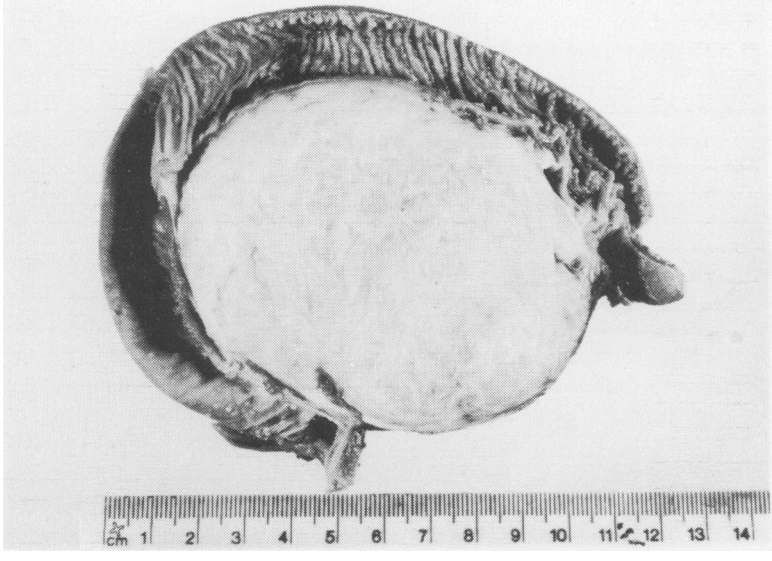

Figure 1.
Mesenteric fibromatosis with attached loop of ileum removed 3 years after colectomy. Ileal polypi are just visible.

Figure 2.
Close up view of surface of ileum showing numerous small lymphoid polypi.

moderate liver enlargement with patchy uptake in two or three areas suggestive of mild hepato-cellular dysfunction but with no evidence of malignant disease. In January 1980 a further swelling was found in the abdominal scar which was assumed to be a further desmoid tumour. A Pan-orthogram did not show any abnormality of the facial bones and examination of the patient's teeth did not show any evidence of caries etc.

DISCUSSION

This case shows several features of Gardner's syndrome but with the notable exception of osteomas of bone. A striking feature is the post-operative mesenteric fibromatosis which is an inconstant feature of Gardner's syndrome but was noted in a case of colonic polyposis by Pugh and Nesselrod (1945). The association with Gardner's syndrome was reviewed by Simpson et al (1964) who reported seven cases. Despite the alarming appearance and the possibility of mistaking the lesion for secondary carcinoma the condition is seldom malignant. However, the prognosis is variable (Simpson et al, Thomas et al. 1968) as ureteric or intestinal obstruction may ensue.

The small lymphoid polypi seen in the ileum are similar to those described in some cases of Gardner's syndrome (Thomford and Greenberger, 1968, Shull and Fitts, 1974). These are of more than academic interest as they may be mistaken for adenomatous polypi. Adenomatous polypi are being recognised with increasing frequency in the stomach (Watanabe, 1978), the duodenum (Schnur et al, 1973) and small intestine (Ross and Mara, 1974 and Case Records of Massachusetts General Hospital, 1978) in colonic polyposis syndromes. Similar polypi may also arise in the ileum in Gardner's syndrome after colectomy (Hamilton et al, 1979).

Adenomatous polypi have some malignant potential and while extra-colonic carcinoma in Gardner's syndrome appears to occur most often around the ampulla

of Vater (Parks et al. 1970, Schnur et al. 1973) it has also been reported in the ileum and jejunum (Case Records of Massachusetts General Hospital 1978). Thus it is important to distinguish adenomatous polypi from lymphoid polypi which do not appear to have malignant potential. Histological identification of small intestinal polypi in polyposis syndromes is advisable in order to avoid needless removal of a segment of ileum (Thomford and Greenberger, 1968).

Desmoid tumours arising close to the colectomy scar are a well documented but variable feature of Gardner's syndrome. Smith (1958) reported histologically confirmed desmoid tumours in abdominal incision scars in 6 out of 17 patients with one or more features of Gardner's syndrome. Schnur et al. (1973) consider that in this disease any incisional mass should be regarded as a desmoid tumour rather than recurrent carcinoma. The tendency to proliferation of fibrous tissue leading to mesenteric fibromatosis and/or soft tissue tumours is a most important feature of Gardner's syndrome (Lockhart-Mummery, 1967). The present case appears to support this point.

The skin lesions in this patient were unusual for Gardner's syndrome. Most reports indicate that they are either epidermoid cysts or sebaceous cysts distributed mainly in the scalp, face, neck and shoulders. The distribution in this case under discussion was similar to this but histological examination showed features of a pilomatrixoma (calcifying epithelioma) rather than epidermoid cysts. Characteristic ghost cells were prominent. This is a benign tumour showing differentiation toward hair cells (Lever and Schaumburg-Lever, 1975). The significance of this tumour in association with Gardner's syndrome is uncertain as it has not been reported before.

Treatment is always difficult and prolonged as the patients and their siblings must be followed-up for long periods. Once the diagnosis is made early, colectomy is indicated as the mortality from carcinoma of the bowel is high. An ileo-rectal anastomosis with frequent sigmoidoscopy follow-up saves the patient from an ileostomy and has proved very satisfactory in our patient. Awareness of all parts of the syndrome is important if unnecessary surgery is to be avoided.

Finally genetic counselling is mandatory for all patients but the moral and ethical aspects arising from sterilisation must be left to each individual patient.

SUMMARY

A case of Gardner's syndrome in a young woman is described. Mesenteric and subcutaneous fibromatosis is especially prominent and other important features include early development of colonic carcinoma and lymphoid polypi in the small intestine. An unusual aspect is that the skin tumours examined proved to be pilomatrixomas (calcifying epitheliomas of Malherbe) rather than the epidermoid or sebaceous cysts usually described in this syndrome.

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ENCEPHALITIS AND CEREBELLAR ATAXIA ASSOCIATED WITH EPSTEIN-BARR VIRUS INFECTIONS

by

T. J. ROBINSON and M. S. GLENN
Craigavon Area Hospital

R. W. TEMPLE
Coleraine Hospital

DOROTHY WYATT and J. H. CONNOLLY
Department of Microbiology and Immunobiology
Belfast BT12 6BN

ENCEPHALITIS and cerebellar ataxia are rare complications of infectious mononucleosis (IM). Until recently the demonstration of a raised titre of heterophil antibodies in a Paul-Bunnell test provided the best objective data for substantiating a diagnosis of IM. Unfortunately, this test may produce both false positive and false negative results and may remain positive for many months after the acute phase of the illness. Epstein-Barr virus (EBV) is a member of the herpes group of viruses and is the causal agent of IM. The development of specific serological tests has allowed a more precise determination of the temporal relationship between EBV infection and various complications. We report two teenage boys who had encephalitis and cerebellar ataxia associated with EBV infections.

METHODS AND CASE REPORTS

The method was based on that of Schmitz and Scherer (1972) with modifications. P3HR-1 lymphoblastoid cells were grown in suspension culture at 33°C for three days to express Epstein-Barr virus antigen. Cells were air dried on coverslips and fixed in acetone for 10 minutes. Sera and CSFs were absorbed with human brain powder, and for detection of EBV immunoglobulin M (IgM) they were further absorbed with heat aggregated human immunoglobulin to remove rheumatoid factor, and with Protein A-Sepharose (Pharmacia) to reduce the immunoglobulin G (IgG). Sera and CSF dilutions were allowed to react with P3HR-1 coverslips for one hour at 37°C for detection of EBV specific IgG and for three hours at 37°C for detection of EBV specific IgM. After washing, fluorescin conjugated sheep anti-human IgG or IgM was allowed to react with the P3HR-1 coverslips for one hour at 37°C, then washed off. Coverslips were mounted in glycerol-saline and viewed with an epifluorescence microscope.

Poliovirus type 2 neutralising antibody was titrated as described by Connolly, Robinson and Canavan (1975). All antibody titres are expressed as reciprocals of 50 per cent endpoint dilutions.

PATIENT 1

A previously fit 15 year old schoolboy was admitted to Craigavon Area Hospital in a semi-conscious state on 8th February 1979. Twenty-four hours previously he developed an upper respiratory tract infection. Twelve hours before admission he

developed headache and vomited on three occasions. He then became progressively more drowsy and about two hours before admission he developed bizarre movements of the limbs and was incontinent of urine.

On admission he was restless, semi-conscious, responding only to painful stimuli. His temperature was 40°C. There was no neck stiffness. Optic fundi were normal. Pupils reacted normally to light. His reflexes were brisk and symmetrical and plantar responses were flexor. He had a few palpable glands in the left axillae but there was no rash and no splenomegaly.

The full blood picture was haemoglobin 14.7 g/dl., WCC 15.1 $\times$ 10^9/l., (75% neutrophils, 15% lymphocytes, 7% monocytes and 3% mononuclears). Electrolytes, urea and blood glucose were normal. He had a lumbar puncture and the CSF was reported as follows:- Clear colourless fluid, red blood cells nil, white cells 6 lymphocytes/mm^3, protein 0.1 g/l, globulin nil, and sugar 4.4 mmol/l. The electroencephalogram (EEG) was abnormal with irregular theta activity at 4-6 c/s. and persistent high amplitude paroxysmal slow activity at 1-3 c/s. bilaterally. He was treated with dexamethasone and chlorpromazine. His level of consciousness slowly improved over the following five days but he remained disorientated in time and place. His memory was poor and he was ataxic, being unable to stand or walk unaided and had difficulty feeding himself. He had some aggressive outbursts.

Blood picture on 14th February 1979 was as follows:- Haemoglobin 15 g/dl., WCC 14.4 $\times$ 10^9/l (44% neutrophils, 24% lymphocytes, 13% monocytes, 1% eosinophils, 1% basophils and 17% mononuclears). The Paul-Bunnell test was positive. The titre in saline was 160, after absorption with guinea pig kidney—80, and after absorption with ox cells—nil. Serum complement fixing antibody titres to mumps, measles, herpes simplex and varicella-zoster virus antigens were not significant.

On the sixth day he had a sudden convulsion which progressed to status epilepticus and did not respond to intravenous diazepam. Treatment with muscle relaxants, intermittent positive pressure ventilation and ACTH was started.

Lumbar puncture was repeated on 15th February 1979 and the CSF was reported as follows:- Clear colourless fluid, red blood cells 21/mm^3, white cells—7 lymphocytes/mm^3, protein 0.35 g/l., globulin—trace, sugar—insufficient for examination. No organisms were seen.

Intermittent positive pressure ventilation was withdrawn after 48 hours but the ACTH was continued for a further five days. Anticonvulsant therapy with oral phenytoin sodium was commenced.

The patient's condition improved rapidly and on discharge 15 days after admission his gait was steady and his mental state had returned almost to normal. At review on 15th March 1979 his mental state had returned to normal and no neurological sequelae were present, although his EEG still showed a mild generalised abnormality. A follow-up EEG nine months later (13th December 1979) was normal.

PATIENT 2

A 17 year old schoolboy was admitted to Coleraine Hospital on 5th February 1979. His illness had begun six days earlier with general malaise and recurrent pain in the left lower chest, aggravated by breathing and slight temperature. For two days before admission he was vomiting frequently and was unable to eat. His chest pain had settled and he had no sore throat, but felt ill and dizzy.

On admission he was afebrile. He was mentally clear but apathetic. He was pale, sweating and slightly tremulous. There was no neck stiffness but he had a few shotty, deep cervical glands. His heart sounds were normal and he had a faint pleural rub in the left lower chest. Liver and spleen were not palpable. CNS findings were negative. On the day following admission he continued to have nausea and vomiting and had a faint macular rash on his trunk. That afternoon he suddenly had a fit which lasted for about five minutes, with right sided twitching. Thereafter he was stuporous, restless and aggressive. His temperature rose to 40°C that evening. His plantar responses became extensor.

A lumbar puncture gave clear CSF with 10 white cells/mm^3, protein 1.4 g/l., sugar 3.7 mmols/l. The blood picture was—Hb. 14.6 g/dl., WCC 12.1 $\times$ 10^9/l., (neutrophils 36%, lymphocytes 54%, monocytes 10%). More than half of the lymphocytes were abnormal virocytes. Mononuclear cells were normal. The sedimentation rate was 3 mm/hr. Chest x-ray was normal. The ECG showed changes in keeping with pericarditis. These changes were later confirmed and subsequently became normal.

Two days after admission he remained irritable and inaccessible, reacting only to painful stimuli. His optic fundi were normal and there was no neck stiffness or other localising CNS findings.

He was transferred that day to the Neurological Department of the Royal Victoria Hospital under the care of Dr. M. Swallow. He was then stuporous and irritable and the general findings were unaltered. His temperature remained elevated for two more days and he then became more responsive and alert. His speech was slow and slurred and there was ataxia of his upper limbs but no nystagmus. The abnormal white cell count improved and a Paul-Bunnell test was positive (titre 128). Serum complement fixing antibody titres to mumps, measles, herpes simplex and varicella-zoster virus antigen were not significant. Virus was not isolated from faeces or CSF. The EEG was reported as follows:- "The patient was semi-conscious. The record is dominated by delta wave complexes at ½-2 Hz of amplitude up to 200 /uv which have at times a sharp quality. The complexes are seen bilaterally, though asynchronously. There is no focus or lateralisation. The record shows a marked generalised abnormality, which is typical of that seen with an inflammatory condition".

He continued to make a gradual recovery without any specific treatment. A week after admission he was still irritable, his speech was still very slurred and he had some headache. He was discharged from hospital after six weeks, at which time his speech and gait were normal and there was no ataxia. Six weeks later he still felt 'slow' mentally and physically. Three months after discharge he felt normal.

RESULTS OF SEROLOGIC STUDIES

The EBV and poliovirus type 2 antibody titres in serum and CSF are shown in the table.

TABLE

Patient	*Day of Illness*	*Specimen*	*EBV Antibody IgG*	*EBV Antibody IgM*	*Poliovirus type 2 antibody*
1	2	Serum	<10	10	—
	12	Serum	80	40	—
	310	Serum	80	<10	—
2	9	Serum	160	40	5120
	9	CSF	4	0	16

In patient 1 there was a >8 fold rise of EBV specific IgG between day 2 and day 12 and this antibody was still present at day 310. The EBV specific IgM showed a 4-fold rise between day 2 and day 12 but had disappeared by day 310. There was EBV specific IgG in the serum and CSF of patient 2 on day 9 and the serum/CSF ratio was 40. Poliovirus type 2 antibody was also present in serum and CSF and the serum/CSF ratio was 320. There was EBV specific IgM in the serum of patient 2 but not in CSF.

DISCUSSION

The diagnosis of encephalitis in both patients was made from the clinical features and the abnormal EEGs. There was gross disturbance of consciousness in both patients but no physical signs of meningitis. Patient 2 had a right sided focal fit and patient 1 had status epilepticus. Aggressive behaviour was also present in both patients. Cerebellar ataxia was noted in arms and legs of patient 1 and in the arms of patient 2. In both patients the CSF had increased white cells and the protein was increased in patient 2. Both patients recovered completely, although in patient 1 the EEG was still abnormal 36 days after onset and patient 2 still felt 'slow' mentally and physically 66 days after onset. The prognosis of neurological complications of IM is reported to be good and death is rare.

The diagnosis of IM was suspected from the clinical features of patient 2 but not in patient 1. Both patients had raised white cell counts in blood. Patient 2 had abnormal lymphocytes in the blood films and both patients had positive Paul-Bunnell tests. The 4-fold or greater rise of EBV specific IgG and IgM in patient 1 indicates a recent infection with this virus. The presence of EBV specific IgM in the serum of patient 2 also indicates recent infection with this virus. The EBV specific IgM response is transient in acute IM and disappears in about 2-3 months after onset (Schmitz and Scherer, 1972) even in those cases without heterophil antibodies (Nikoskelainen, Leikola and Klemola, 1974). Poliovirus neutralising antibody can be used as an unrelated marker for an intact blood-brain barrier. Clarke, Dane and Dick (1965) found that there is a poliovirus serum/CSF antibody ratio ranging from 256 to 2048 in healthy people if serum and CSF samples are taken at the same time from the patient. The poliovirus type 2 serum/CSF ratio in patient 2 was 320, which excludes contamination of the CSF with blood when the sample was taken and also a non-specific leak of serum antibody into the CSF possibly due to inflammation of

the blood brain barrier. The EBV IgG serum/CSF ratio on the other hand was 40, which is eight times lower and indicates either that EBV IgG antibody was being produced or released inside the CNS or there was selective permeability through or specific transport of EBV IgG across the blood brain barrier.

It has been estimated that the nervous system is involved in about one per cent of patients with IM who are admitted to hospital with complications (Gautier-Smith 1965, Schnell et al 1966). When there is involvement of the nervous system the usual symptoms and signs of IM although present may be overshadowed by the clinical features of the neurological syndrome. The neurological involvement described in IM may be an acute psychosis with aggressive and irrational behaviour, fits or the Guillane-Barré syndrome. Meningoencephalitis, transverse myelitis, acute cerebellar syndrome or Bell's palsy have also been described (Schnell et al 1966, Grose et al 1975). Chorea (Friedland and Yahr 1977) and retrobulbar neuritis (Pickens and Sangster 1975) have also been reported.

Encephalitis was first described in association with glandular fever by Epstein and Dameshek (1931) and approximately 100 cases had been described up until 1954, although very few were in children (Walsh, Poser and Carter 1954). Custer and Smith (1948) described the pathology in fatal cases of IM. In the brain signs of acute inflammation were absent or minimal, and there was some perivascular cuffing with inflammatory cells. Sworn and Urich (1970) describe a true polio-encephalitis in a fatal case with perivascular cuffing and infiltration of the brain parenchyma with inflammatory cells, while Ambler et al (1971) describe an inflammatory demyelinating lesion in an occipital lobe biopsy which was consistent with an allergic or post-infectious encephalomyelitis. The biopsy was taken during convalescence from IM. EBV has been isolated from the CSF in encephalitis (Halstead and Chang 1979). In three patients EBV infection has been associated coincidentally with subacute sclerosing panencephalitis (SSPE). Hochberg et al (1976) describe herpes type particles in the brain of SSPE and EBV antigen in addition to measles virus.

Involvement of the cerebellum in IM is very rare and few patients with clinical evidence have had serological confirmation of EBV infection (Lascelles et al 1973, Bajada 1976, and Cleary, Henle and Pickering 1980). Dowling and Van Slyck (1966) reviewed six cases from the literature of cerebellar involvement, where the Paul-Bunnell test was used for diagnosis. In fatal case of IM, Bergin (1960) refers to oedema or degeneration of the Purkinje cell layer of the cerebellar cortex and perivascular inflammation. Patient 2 had EBV specific IgG in serum and CSF, and EBV specific IgM in serum but not in CSF. CSF-EBV antibody has also been found by Lascelles et al (1973), Joncus et al (1974) and Hochberg et al (1976) but not by Bajada (1976) or Cleary, Henle and Pickering (1980).

In one study of primary EBV infections in acute neurologic diseases of 14 patients (Grose et al 1975) it was found that only one patient had obvious clinical IM and only five patients had heterophil agglutinins. It is now clear that about 10 per cent of young adults and a substantially greater proportion of paediatric patients with the disease do not develop heterophil antibodies (Grose et al 1975, Lange et al 1976).

It is obvious that EBV infection must be considered in the diagnosis of various acute neurological diseases affecting children and young adults even in the absence of a heterophil antibody response or other signs of IM.

SUMMARY

Two teenage boys had encephalitis and cerebellar ataxia associated with EBV infections. The clinical signs and blood picture were not typical of infectious mononucleosis in one boy, although both boys had positive Paul-Bunnell tests. Recovery was complete in both boys but abnormalities of the EEG were still present 36 days after onset in one boy while the other boy felt 'slow' mentally and physically 66 days after onset. A rising titre of EBV specific IgM and IgG was found in one boy. The other boy had EBV specific IgM in his serum and EBV specific IgG in his CSF, which was there in excessive quantity in relation to his serum EBV specific IgG. This indicates that EBV specific IgG was being produced or released inside the CNS. There may also have been selective permeability or specific transport of EBV specific IgG across the blood brain barrier.

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TALONAVICULAR SYNOSTOSIS

by

H. A. YEATES, F.R.C.S.

Senior Orthopaedic Registrar

The Withers Orthopaedic Centre
Musgrave Park Hospital, Belfast

CONGENITAL fusion of two or more bones of the tarsus is referred to as tarsal coalition and affects some 2% of individuals. All forms of coalition from involvement of two adjacent bones to massive tarsal fusion have been recorded. Tarsal fusion was well recognised by anatomists long before attention was drawn to its clinical significance. Slomann (1921) and Badgley (1927) were first to describe the association of fusion of the calcaneum and navicular with a rigid form of flat foot. Harris and Beath (1948) in their classical paper on peroneal spastic flat feet found that a large proportion were due to a bridge of bone arising from the medial side of the talus, crossing the subtalar joint and joining a mass of bone on the medial side of the calcaneum.

One of the less common forms of tarsal coalition is fusion of the talus and navicular referred to as talonavicular synostosis. This paper reports the first example of talonavicular synostosis in twins and describes three cases all occurring in the one family.

CASE REPORTS

Case One:—A twelve year old boy presented to the orthopaedic clinic with a six month history of pain in the dorsum of his right foot. The pain was not well localised and was not severe. It occurred after exercise and did not interfere with any of his activities. Clinically, he was tall and overweight for his age. He had slight loss of the medial longitudinal arch of both feet. Movements at the midtarsal joint were markedly restricted. X-ray (Figures 1 and 2) showed fusion of the talus and navicular with a large flattened square head at the naviculocuneiform joint. There were identical changes in the other foot.

Case Two:—The asymptomatic non-identical twin brother of the boy in case one was also examined. A similar clinical picture existed. X-rays also showed talonavicular synostosis with the suggestion of a demarcation line at the site of the expected talonavicular joint.

Case Three:—The mother of the twin boys was also examined, She, too, was overweight with a mild degree of rigid flat feet. She was symptom free. X-rays also showed talonavicular synostosis.

The thirteen year old sister of the twin boys was also X-rayed and found to have normal feet. The twins maternal grandfather apparently had flat feet all his life but had no symptoms and was never X-rayed during his life.

X-rays of the carpal bones in all three cases were normal.

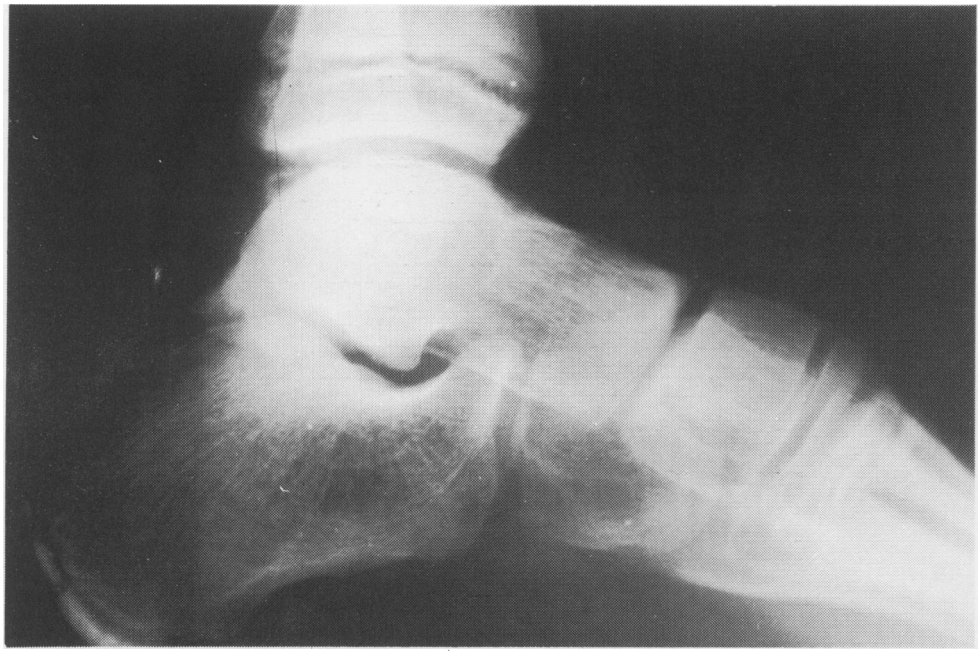

FIGURE 1. *Lateral X-ray of the left foot of a twelve year old boy showing talonavicular synostosis.*

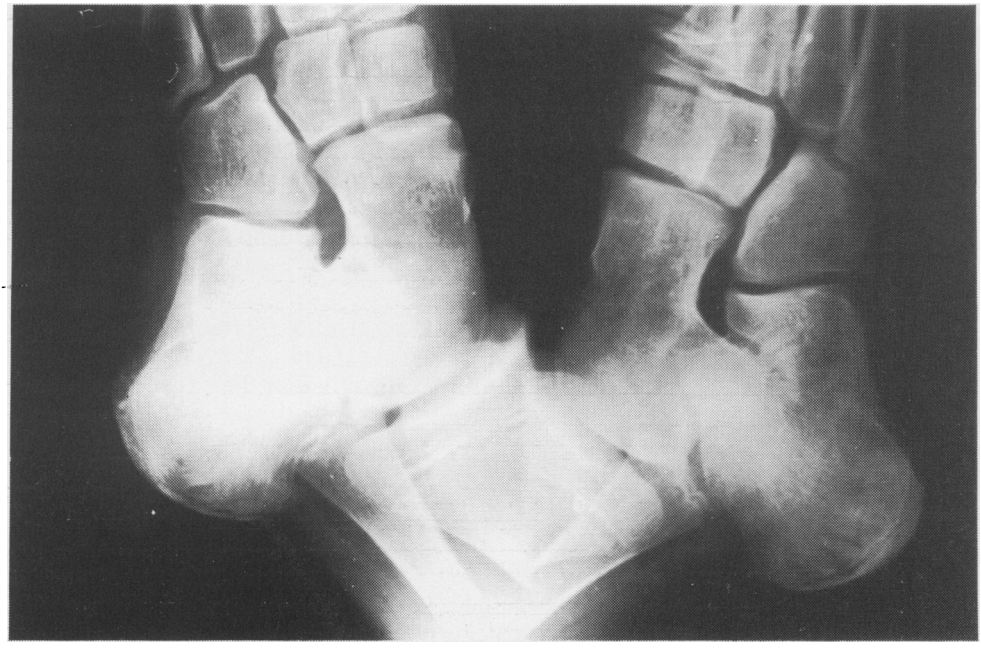

FIGURE 2. *Oblique projection of same foot.*

DISCUSSION

In 1879, Dr. R. J. Anderson, a Demonstrator of Anatomy in the Queen's College, Belfast reported the first case of an astragalo-scaphoid bone in man. He recorded in great detail the anatomical findings of the fused bones during the dissection of the feet in a thirty-four year old man.

Holland in 1918 reported the first case of talonavicular synostosis diagnosed on X-ray, in the feet of a 21 year old female with multiple bone fusions. Six single case reports were described up to 1935, when Rothberg recorded the first series of cases occurring in the one family. In Boyd's series of four cases, three were of bilateral involvement spanning three generations of one family.

Schreiber in 1963 reported five cases, with one patient also having a ball and socket ankle joint. Geelhoed, Neel and Davidson described in 1969 two families with the hereditary syndrome of symphalangism and tarsal coalitions of the talonavicular type. Another family was observed by Challis in 1974.

In 1979, Channon and Brotherton, writing on the ball and socket ankle joint, found fusion of the talus and navicular in two of their patients and fusion of the talus, navicular and calcaneum in another four.

As in most of the recorded cases the patients in this series had no outstanding complaints and no treatment was necessary. Talonavicular synostosis presents with mild pain in the foot or as a prominence along the medial border. Loss of the medial arch is not often a significant feature. Diagnosis is made on X-ray with absence of the talonavicular joint or a faint demarcation line representing its expected position. The abnormality can easily be missed on first inspection of a standard lateral X-ray of the foot. None of the cases on record have required surgical intervention, symptoms most often being relieved by wearing a supportive insole.

Evidence on the hereditary transmission of tarsal coalitions is accumulating. Rothberg, Feldman and Schuster (1935) and Boyd (1944) have shown a definite hereditary factor in bilateral talonavicular synostosis. Talocalcaneal coalition in two sisters has been reported by Webster and Roberts (1951). Wray and Herndon (1963), writing on another form of tarsal coalition, a calcaneonavicular bar, believed that transmission is by a specific gene mutation behaving as an autosomal dominant. Leonard (1974) examined ninety-eight first degree relatives of patients with a talocalcaneal bridge or a calcaneonavicular bar and found that almost half had some form of tarsal coalition. Geelhold's (1969) families with talonavicular synostosis and symphalangism adds support to the autosomal dominant type of inheritance. Proximal symphalangism of the fingers of the hand is known to be dominantly inherited and has the longest pedigree of any human genetic anomaly known (Drinkwater, 1917), Bersani and Samilson (1957) recorded massive familial tarsal synostosis in the feet of a boy, his sister and mother. Nixon (1978) in his paper on the multiple synostoses syndrome, or what was formerly called the Nievergelt-Pearlman syndrome (tarsal and carpal fusions, symphalangism, and elbow dysplasia) states that inheritance is by an autosomal dominant trait of variable penetrance and probably caused by a single gene abnormality. This present series of non-identical twin brothers and their mother with talonavicular synostosis supports the autosomal dominant mode of inheritance. Perhaps the last word should go to Anderson who, in his original paper, observed that talonavicular fusion was normal

in crocodiles and believed that tarsal coalition represented a return to a more primitive type of development.

SUMMARY

Talonavicular synostosis is an uncommon tarsal abnormality. Three cases occurring in the one family are reported and the mode of inheritance discussed.

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W. J. WILSON AND THE WEIL-FELIX REACTION

by

H. G. CALWELL

Office of Archives
Royal Victoria Hospital, Belfast

EPONYMS abound in medical literature which call to mind long dead workers in many fields of medicine. We speak of Addison's anaemia, of Bright's disease, of Corrigan's pulse and so on right through the alphabet to Ziehl who shares the stain for Mycobacteria with Neelsen.

Eponymy is however not an absolute guarantee against what Sir Thomas Browne called the iniquity of oblivion. Times and names change. *Brucella abortus* has supplanted the bacillus abortus of Bang. I was taught that diphtheria was caused by the Klebs-Loeffler bacillus, but that pathogen is now *Corynebacterium diphtheriae.* Klebs has survived in *Klebsiella pneumoniae,* but at the expense of Friedlaender who once had sole rights in the organism.

As well as being transient, eponyms do not always tell the whole story as the following example will show. It has long irked me that the late Professor William James Wilson who taught public health in Queen's from 1906 to 1947 is excluded from the attribution of the test for typhus fever which is universally known as the Weil-Felix reaction. Working in the Koch Institute, Berlin, in 1916 these two bacteriologists isolated certain strains of the proteus bacillus from patients with typhus fever. In 1917 they discovered that these organisms were agglutinated by the serum of patients suffering from the disease. A diagnostic test for typhus fever was in sight.

Let Wilson now take up the story in a letter he wrote to the British Medical Journal (16 June 1917, page 825) from France when serving with the Royal Army Medical Corps during the Great War:-

> TYPHUS FEVER AND THE SO-CALLED WEIL-FELIX REACTION
>
> SIR,—In the BRITISH MEDICAL JOURNAL of May 19th, 1917, p.649, the following note is given;
>
> The German authorities have arranged for the systematic testing at the Robert Koch Institute of blood taken from patients suspected of typhus fever. The Weil-Felix reaction is employed, and whenever the reaction is negative but the clinical symptoms remain suspicious, a second sample is examined.
>
> I read this with great interest, since it shows that investigations carried out by me at Belfast some ten years ago are now being confirmed on an extensive scale. The results of my investigations were published in the Journal of Hygiene. The names of my papers are "The Etiology of Typhus Fever"[1] and "Heterologous agglutinins, more particularly those present in the blood serum of cerebro-spinal fever and typhus fever cases".[2] In these publications I showed that in typhus fever the blood serum often agglutinates intestinal bacilli . . . especially a coliform bacillus isolated from the urine of certain cases. I pointed out in the paper dealing with the etiology of typhus fever that the presence of these agglutinins did not necessarily imply that the bacillus in question was of etiological importance . . . . The whole question of heterologous agglutinins is fully discussed in my paper in the Journal of Hygiene, and, before the reaction is credited to Weil and Felix, I think it but fair that my work on the subject should be considered . . . .
>
> 1. *Journal of Hygiene,* 1910, Vol. X, p.155
> 2. *ibid.* 1909, Vol. IX, p.306

The specific part of the reaction used in the diagnosis of the rickettsial infection responsible for typhus fever *viz* the agglutination of *Proteus* X 19 cannot be attributed to Wilson. His contribution was the recognition of heterologous agglutination in typhus fever which is the basis of the Weil-Felix reaction. It should not be impossible to give him a share in the credit for the discovery of the test. As far as I know the only medical author who has connected his name with it is the late Sir Henry Letheby Tidy who, writing of the diagnosis of typhus fever, mentioned the Weil-Felix reaction and added—"Priority for the reaction is due to W. J. Wilson (Belfast)".[1]

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DIAGONAL EAR-LOBE CREASE: AN INDEPENDENT RISK FACTOR IN CORONARY HEART DISEASE?

by

R. PAUL FARRELL, M.B., B.Ch.
and
ALISON M. GILCHRIST, M.B., B.Ch.

(A study conducted while final-year medical students)

A DIAGONAL ear-lobe crease as an independent risk factor in coronary heart disease was first suggested by Frank[1, 2] in 1973 and further work by Lichstein and associates[3, 4, 5] supported Frank's initial observations. One study by Christiansen J. S. and co-workers[6] in Denmark went as far as to suggest a more positive correlation between the ear-lobe crease and coronary heart disease than between the accepted major risk factors of arterial hypertension, cigarette smoking and diabetes mellitus and coronary heart disease. Against this Mehta and Hamby[7] showed no correlation between the ear-lobe crease and coronary heart disease and suggested a previously observed increase in incidence of ear-lobe creases with increasing age as the only important factor. With this as a background, we decided to undertake a small survey of patients with proven coronary heart disease to see if this easily detectable sign was relevant as a marker in patients at risk of coronary heart disease.

METHOD

During a two week period in December 1979, 23 patients with acute myocardial infarcation in the coronary care units of the Ulster Hospital, Dundonald and the Royal Victoria Hospital, were examined for the presence of a diagonal ear-lobe crease. The ear-lobe crease was said to be present if it was either unilateral or bilateral. The patients were matched for age and sex with a group of 23 patients in general surgical wards in the same hospitals, who had no previous history of myocardial infarcation, angina or intermittent claudication. The patients were all examined by the same observer.

RESULTS

	Positive Ear-Lobe Crease	*Negative Ear-Lobe Crease*	*Totals*
Patients with acute myocardial infarcation	17	6	23
Controls	20	3	23
Totals	37	9	46

These results when submitted to a chi-square test, with the Yates correction for small numbers give a P value of 0.55. This is considered highly insignificant.

DISCUSSION

The possibility that the easily observed, diagonal ear-lobe crease might be an independent risk factor in coronary heart disease and might thus enable appropriate patients to be identified and encouraged as strongly as possible to reduce their exposure to other known risk factors e.g. cigarette smoking, is certainly an attractive idea. However, as is suggested by our results, it appears that in Northern Ireland the incidence of ear-lobe crease is not statistically higher in those people who have had an acute myocardial infarcation, and so the identification of an ear-lobe crease does not have any significance as to the likelihood of there being any disease of their coronary arteries.

The number of patients and the time span of this survey were of necessity small, but the results are such, that the chance of them being misrepresentative of the general population of Belfast is extremely small. One point of interest, which may be of relevance to the conflicting results in the literature, is the different ethnic and racial backgrounds of the populations used in previous surveys—Frank in California; Lichstein and associates in New York; Kaukola[8] in Finland and Christiansen and co-workers in Denmark, who all supported the correlations, and Rhoads and Yanok[9] on Japanese in Hawaii; Mehta and Hamby in Long Island Jewish Hillside Medical Centre and ourselves in Northern Ireland, who do not support the correlation. The influence of the racial background would require much more detailed investigation.

METHOD

In a controlled study of 23 patients with acute myocardial infarcation and 23 matched controls it was found there was no correlation between ear-lobe creases in the occurrence of myocardial infarcation (or coronary artery disease).

We are indebted to Dr. Denis Boyle for instigating our interest in this subject, the consultants of the Regional Cardiology Centre, Royal Victoria Hospital and the consultant surgeons of the Ulster Hospital, Dundonald and the Royal Victoria Hospital for access to control subjects and to Dr. A. Evans for his invaluable help with the statistical analysis.

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PSEUDOCYST AND ABSCESS OF THE PANCREAS

by

DANIEL J. M. KEENAN, B.Sc., F.R.C.S.
EDWARD M. McILRATH, F.R.C.R.
GEORGE W. JOHNSTON, M.Ch., F.R.C.S.
TERENCE L. KENNEDY, M.S., F.R.C.S.

The Royal Victoria Hospital, Grosvenor Road, Belfast

PANCREATIC pseudocysts and abscesses are rare, each occurring in less than 4 per cent of cases of acute pancreatitis.[1, 2, 3, 4] Both occur at differing intervals following an attack of acute pancreatitis, the abscesses occurring earlier.[5] Differentiation between them is often difficult[6, 7] and is more so in the early weeks, due to oedema from the acute pancreatitis. Until recently, differentiation was mainly on clinical grounds but the introduction of ultrasound and CT scanning techniques has helped to change the situation.

A retrospective analysis was carried out to try to delineate those factors which could help to differentiate the conditions and to assess the methods of treatment.

CLINICAL MATERIAL

Over a period of 19 years, since 1960, 30 pseudocysts of the pancreas and 15 abscesses were managed at the Royal Victoria Hospital, Belfast. There were 24 men and 21 women in the series (Table 1); the average age was 51 years (range: 15-79 years). Thirty-seven of the patients had a recent attack of acute pancreatitis and nine patients had multiple attacks. The average time from the onset of pancreatitis to the diagnosis of abscess was three weeks; for pseudocysts it was 19 weeks. Gallstones were the commonest precipitating factor occurring in 18 patients, and alcohol played a role in 9 instances (Table 2). Two patients developed pseudocysts during pregnancy and a further patient following blunt trauma.

SYMPTOMS AND SIGNS

The majority of patients had upper abdominal pain which was often combined with back pain. Vomiting was also common. Twenty-five of the patients with

TABLE 1

Numbers of patients seen from 1960-1978

	Pseudocyst	*Abscess*
Female	11 (1)	10 (4)
Male	19 (2)	5 (0)
Total	30 (3)	15 (4)

Deaths in parenthesis.

TABLE 2

Numbers of patients seen according to aetiology

Aetiology	*Pseudocyst*	*Abscess*
Gallstones	10 (1)	6 (2)
Alcohol	5	2
Gallstones and Alcohol	2	—
Idiopathic	8 (2)	6 (2)
Other	5	1

Deaths in parenthesis.

pseudocysts had palpable masses, varying in size from 5 cm to 15 cm. Seven of the patients with a pancreatic abscess had a palpable mass but none was greater than 5 cm in diameter. Six patients with abscess had, in addition, a pleural effusion.

INVESTIGATIONS

The introduction of ultrasound and CT scanning has revolutionised the diagnosis of pancreatic inflammatory masses and the differentiation of acute pancreatitis from swelling due to abscess or pseudocyst (Figs. 1 and 2). The majority of patients in this series, however, were investigated prior to availability of these techniques; only 12 patients were studied in these ways (Table 3). Serum amylase was raised in 25 patients; the levels were higher in those with pseudocyst with a mean of 1,200 Somogyi units (range: 51-14,600) than for pancreatic abscess whose mean was 203 Somogyi units (range 39-550). The leucocyte count was higher for abscess (mean: 15,500) than for the pseudocyst (mean: 9,500). Pre-operative random serum glucose levels were frequently elevated in both groups. Two of the patients with pancreatic abscess were known to be diabetics prior to admission, and one further patient became diabetic; five of the patients with pseudocyst subsequently developed diabetes mellitus.

TABLE 3

Imaging investigations.
Numerator—Number of occasions the investigation was of help
Denominator—Total number of occasions it was performed

Investigation	*Pseudocyst*	*Abscess*
Barium Meal	22/22	3/3
Ultrasound Scan	6/7	2/2
CT Scan	1/1	2/2
Angiography	2/3	1/1

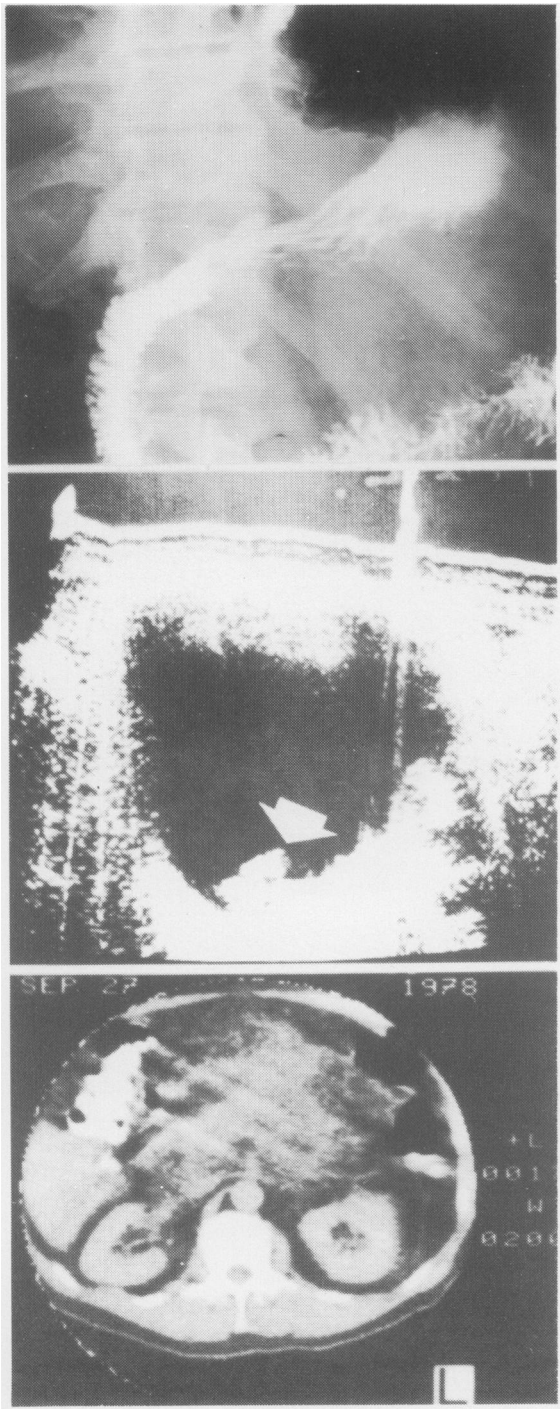

FIGURE 1

Barium meal (a), longitudinal ultrasound scan (b) and CT scan (c) in a male patient with a past history of acute pancreatitis, who had, in his abdomen, a palpable mass which proved to be a pancreatic pseudocyst.

(a) BARIUM MEAL.
Shows enlargement of the duodenal loop, elevation of the antrum, with an impression of the upper, lesser curve.

(b) ULTRASOUND.
Shows classical transonic area with a dependent slough (arrowed).

(c) CT SCAN.
Shows the overall extent of the mass, but does not shows its cystic nature.

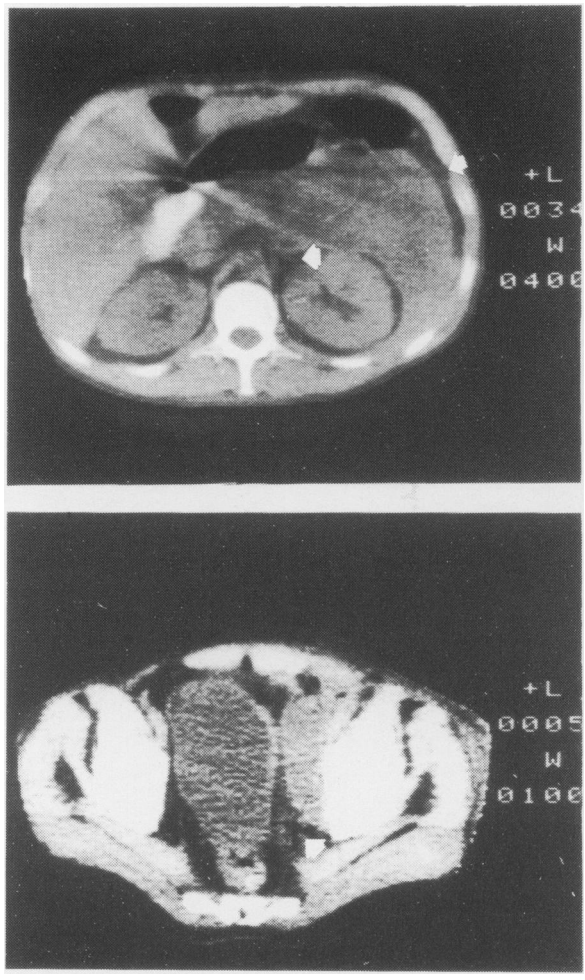

FIGURE 2

CT scan at the level of the pancreas (a) and hip joints (b).

This demonstrates the value of a CT scan in assessing the extra-pancreatic extent of disease, showing a pancreatic abscess extending into the left flank (arrowed), the perinephric area (arrowed) and extending along the obturator internus in the pelvis, via the psoas sheath (arrowed).

Barium studies of the upper gastro-intestinal tract (Fig. 1) were carried out in 25 patients and in all cases were helpful in localising retrogastric swellings (Table 3), but could not differentiate between abscess and cyst. Selective angiography was carried out in 4 patients where the question of tumour was raised, but the advent of ultrasound and CT scanning has largely eliminated the need for this invasive investigation. Endoscopic retrograde pancreatography was not employed because of the risk of infecting a pseudocyst.

MANAGEMENT

In those patients with pseudocysts, 26 were treated surgically and three conservatively; whilst the respective figures for those with abscesses were 11 and two. The average volume of fluid in the cysts was 1.2 litres. Cystogastrostomy was employed in 22 patients with pseudocyst and in three with abscess. The majority of

abscesses were drained externally, two patients requiring a second operation for drainage of recurrent abscess. External drainage was used in each of five patients with pseudocyst. In two it was used to drain the second cyst to the exterior, while the retrogastric pseudocyst was drained internally into the stomach. One pseudocyst was aspirated in combination with biliary tract surgery. In all 11 patients had additional biliary tract surgery; cholecystectomy in 2, cholecystectomy with exploration of the common bile duct in 3, choledochoduodenostomy in 2 and cholecystostomy, exploration of the common bile duct, cholecystodudenostomy and choledochoduodenostomy respectively in the others. Rupture into the peritoneal cavity and retroperitoneal tissues occurred in six patients with pancreatic abscess. In the remainder, the mass was confined to the pancreatic region. The organisms cultured were Klebsiella, Proteus, *E. coli.* and Staphylococci.

Six patients treated by external drainage developed a pancreatic fistula. Neither of the two patients with double cysts, who had simple drainage combined with cystogastrostomy, had this complication. In addition, two patients developed temporary colonic fistulae which closed spontaneously. Severe secondary haemorrhage occurred in two patients, one of whom required surgical intervention. The average length of stay in hospital was six weeks (range: 2-40 weeks).

MORTALITY

Of the 37 patients treated surgically, there were 3 post-operative deaths, 2 following cystogastrostomy for pseudocyst and 1 following drainage of an abscess. One of the pseudocyst patients died within the first 24 hours, probably from haemorrhage, but autopsy was not carried out. The other developed a pancreatic fistula with ascending cholangitis and died 13 days later. The third post-operative death resulted from generalised peritonitis and septicaemia, six weeks after external drainage of the abscess. One patient who had a conservatively treated abscess died of septicaemia and peritonitis. Three patients had the diagnosis made at autopsy, one with a ruptured pseudocyst, the others peritonitis following from an abscess.

FOLLOW-UP

One year after discharge from hospital 36 of the 38 survivors were available for review. All but five patients were symptom-free. One developed a recurrent pseudocyst two weeks after the first operation, and required revision of the anastomosis. Two patients, who had suffered from pseudocyst, had developed further attacks of acute pancreatitis, and two others complained of persisting upper abdominal pain.

During subsequent follow-up, one patient developed a recurrent pseudocyst two years after cystogastrostomy and was treated by transduodenal anastomosis of the pseudocyst combined with choledochoduodenostomy. Three patients had progressed to chronic pancreatitis and one of these required a pancreaticoduodenectomy. Three other patients developed sclerosing-cholangitis, portal hypertension and pyloric stenosis respectively.

DISCUSSION

Pancreatic abscess and pseudocyst are relatively uncommon complications of acute pancreatitis. The reported incidence for either is between 2 and 4 per cent,

pseudocysts occurring more frequently than abscesses.[1, 2, 3] As in other British series, gallstones was the most commonly observed aetiological agent.[3, 8] Next in frequency was the idiopathic group followed by those in whom alcohol was implicated. Only one case was attributable to trauma. This is less than other series.[7, 8, 9, 10] No case followed operation or invasive investigation, again contrasting with other reports.[5, 11]

It has been suggested that pancreatic abscesses occurring in alcoholics have a lower incidence of post-operative complications and fatalities.[5, 11] The present results tend to support this view; there were seven patients with a definite alcoholic aetiology and none died, developed fistulae or had recurrence. Their average stay in hospital was also shorter than that of those associated with biliary pathology. Patients whose aetiology was unknown had the highest mortality. It was also found that patients who developed a pseudocyst or abscess after multiple attacks of pancreatitis fared no worse than those who had had only a single attack.

The triad of symptoms, abdominal pain, back pain and vomiting has been observed repeatedly.[3, 9] A palpable mass was present in over 80 per cent of pseudocysts but in less than 50 per cent of patients suffering from pancreatic abscess. In many patients an abscess was diagnosed on the basis of a history of acute pancreatitis together with persistent pyrexia and leucocytosis, but in a significant number of patients was first found at autopsy.[3, 5] Only eight of our patients had a pre-operative diagnosis of pancreatic abscess. The mean time interval between the acute episode of pancreatitis and the development of a pseudocyst was 19 weeks. An average period of six weeks has been reported,[3] the greater interval in our series is, however, due to two patients with an exceptionally long latent interval, three years and two years respectively.

The barium meal represents a readily available and a reliable method of localising a pancreatic inflammatory mass, particularly if adequate distension of the stomach, duodenum and upper jejunum are combined with multiple projections. The supine decubitus position is mandatory, and prone views, if possible, are helpful in lesions involving the body and tail. Unless there is evidence of gas within the mass, no indication can be given as to the presence of an abscess. The rapid advance of ultrasound technology has made this the method of choice for demonstrating inflammatory disease. Recent experience suggests that it is possible to differentiate accurately a solid from a fluid-filled, inflammatory mass and to monitor the progress of inflammatory pancreatic disease. In the two years that CT scanning has been available here, it has been possible to compare the images obtained with those of ultrasonography. The advantages of CT scanning are the ability to image the distal pancreas in all cases, even in the presence of bowel gas, and the ease with which multiple masses and extrapancreatic extension can be delineated. There was no obvious superiority in the demonstration of necrotic slough within the cavity, or in the ability to differentiate inflammatory exudate from the fluid content of a pseudocyst.

The treatment of choice for pancreatic pseudocyst is cystogastrostomy where feasible. Although five patients in this series had external drainage, this was because the anatomical position of the cyst made cystogastrostomy difficult. There were eight post-operative pancreatic fistulae and five occurred after external drainage of pancreatic abscesses. Those secondary to abscess closed spontaneously while those

related to pseudocyst required further surgery in two cases and contributed to death in another case. The combination of internal and external drainage in the two patients with double cysts did not, however, result in fistula.

The hospital mortality for pseudocysts was 10 per cent and includes a post-operative mortality of 7 per cent; whilst the respective figures for those with abscesses were 27 and 7 per cent. These are similar to other reported series.[3, 7, 11, 12]

When a patient develops a palpable mass after an acute attack of pancreatitis there is no reliable method which can distinguish the fluid containing pseudocyst or abscess from the swelling due to the pancreatic inflammatory mass. Folk[13] coined the term 'pseudopseudocyst' to describe the acute oedema of the pancreas, and it is our experience that the final diagnosis is made only at laparotomy in 30 per cent of cases. Indeed even at laparotomy, it can occasionally be difficult to be certain.[13, 14] It is hoped that the combination of CT and ultrasound scanning will rationalise management in the future, thereby avoiding unnecessary laparotomy which increases the risk of major peripancreatic infection.[15]

SUMMARY

Experience gained from 30 cases of pseudocyst and 15 abscesses of the pancreas seen in the Royal Victoria Hospital Belfast, in the past 19 years, has been reviewed. Thirty-seven patients were operated upon with three post-operative deaths. Five were treated conservatively, with one death, and three were first diagnosed at autopsy. Gallstones were the commonest aetiological agent. Clinical features were of the most value in differentiation. Cystogastrostomy was most commonly used to drain the pseudocysts while external drainage was used for the abscesses. There was only one pseudocyst which ruptured spontaneously. Following cystogastrostomy, recurrence and haemorrhage each occurred on two occasions, while following external drainage there were six persistent fistulae. Three patients went on to develop chronic pancreatitis.

ACKNOWLEDGEMENTS

We wish to thank our surgical colleagues who gave us access to the records of their patients.

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The format of the journal is neat and the paper and illustrations are of high quality. The references do not intrude on the text. The quality of the papers published in the first issue is generally high. They are drawn from many different European countries. They deal with some of the main branches of clinical cardiology, electrophysiology, electrocardiography, drug therapy, surgery, non-invasive diagnostic techniques and, significantly, include a major paper on the prevention of coronary heart disease by the WHO European Collaborative Group. The provision of a forum for such collaborative studies will almost certainly act as a stimulus for more to be carried out. This must be welcomed. Though the Editor admits that the first issue does not include the full range of articles, editorials, reviews, notes and correspondence, it does strike a pleasing balance. Especially welcome are the invited editorial comments which follow several of the major papers. These are cogent and succinct.

This journal will enable cardiologists from the smaller European countries to bring their work before a wider audience than would have been reached by their national cardiological journals. At the same time it will be a useful way of notifying cardiologists of meetings of the various working groups of the European Society of Cardiology. Therefore, as one who in 1978 voted against the creation of a European Heart Journal, I now congratulate those who have brought out this promising first issue. If subsequent issues continue and extend the high standards of the first, the European Heart Journal will rapidly become one of the important cardiological journals. M.E.S.

A PATIENT'S GUIDE TO DIALYSIS AND TRANSPLANTATION. By Roger Gabriel. (Pp 124. £4.95). Lancaster: MTP Press, 1980.

THIS 124 page book contains information of value to the patient whose kidney function is declining and who will soon need regular dialysis treatment. There is a useful glossary of terms used in dialysis treatment, but the term "hypo" surely cannot be in general use to describe a hypotensive episode during dialysis. "Hypo" has another slang meaning and seems a particularly unfortunate choice of abbreviation. The chapter on social service support is valuable.

The descriptions of the various methods of treatment are clear, but the omission of any mention of single needle dialysis is surprising in 1980. Most patients would regard this as a major improvement in treatment—in the Belfast Renal Unit two needle dialysis was phased out in 1978 in favour of the single needle method. The principle of continuous ambulatory peritoneal dialysis is incorrectly stated although the detailed dscription which follows is correct.

The weakest part of the book is the part dealing with renal transplantation. This chapter would make very alarming reading for a patient awaiting a transplant. It gives a very gloomy view of results of transplantation, showing a graph of information (undated) "obtained from many transplant units in Europe" with no mention of the fact that the results of many United Kingdom units are very much better than those shown. It is pointless to draw attention to the fact "a transplanted kidney does not work forever" since this applies to the natural kidney, and a statement like this is psychologically undesirable. Kidney transplantation began to emerge from the experimental stage only about 1965, but there are already significant numbers of perfectly fit patients whose renal transplants continue to function after more than 10 years.

I would hesitate to recommend this book to many of my patients because of the attitude shown to renal transplantation, despite its usefulness on other aspects of their treatment. M.G.McG.

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The weakest part of the book is the part dealing with renal transplantation. This chapter would make very alarming reading for a patient awaiting a transplant. It gives a very gloomy view of results of transplantation, showing a graph of information (undated) "obtained from many transplant units in Europe" with no mention of the fact that the results of many United Kingdom units are very much better than those shown. It is pointless to draw attention to the fact "a transplanted kidney does not work forever" since this applies to the natural kidney, and a statement like this is psychologically undesirable. Kidney transplantation began to emerge from the experimental stage only about 1965, but there are already significant numbers of perfectly fit patients whose renal transplants continue to function after more than 10 years.

I would hesitate to recommend this book to many of my patients because of the attitude shown to renal transplantation, despite its usefulness on other aspects of their treatment. M.G.McG.

TUBERCULIN TEST IN CLINICAL PRACTICE. By Maxwell Caplin. (Pp 84. Plates colour 44. £5.75). London: Bailliere Tindall, 1980.

WITH the decline of tuberculosis in our community, a positive tuberculin reaction has an enhanced significance commonly indicating a need to treat the individual and to trace the source of his infection. The increasing rarity of tuberculin reactors makes it difficult for the younger doctor to acquire the expertise of his elders in separating a positive tuberculin test from the other possible skin reactions.

Dr Caplin's book will be invaluable to the clinician puzzled by an unusual skin reaction following the tuberculin test. The core of the book is a clear and detailed account of methods of Mantoux, Heaf and Tine testing and their exact interpretation. These sections are illustrated with excellent colour photographs of every conceivable skin reaction. They should be compulsory reading for anyone who subjects his patients to tuberculin testing.

Dr Caplin writes clearly and will be understood by the most junior medical student or nurse, yet there is adequate detail in his text and few will need to resort to the well selected references which follow each chapter. It is a pity that he offers no immunological insight into the nature of the tuberculin reaction. This might have improved the subsequent sections dealing with factors which can alter tuberculin sensitivity including BCG, chemoprophylaxis and many disease processes. There are also brief but thought-provoking chapters on tuberculin testing in the community and the need for international standardisation of methods of tuberculin testing.

This book will obviously appeal to those involved in preventive medicine and should be readily available for reference at any health centre or clinic when tuberculin testing is undertaken. Though it may not find its way onto most medical book shelves, it should certainly be included among the standard texts in any medical library, since the collected information on tuberculin testing is available in a readily accessible and well illustrated form. It is an inconspicious book which will not date and will be regularly referred to over the years—as such it deserves a heavier duty binding! D.A.C.

TOPICAL STEROID TREATMENT FOR ASTHMA AND RHINITIS. By N. Mygind and T. J. H. Clark. (Pp 188, Figs 59. £9.50). London: Baillière Tindall, 1980.

THE object of this book was to provide a substantial review, presenting the general significance of this form of treatment. In fifteen chapters, separate authors from the United Kingdom, Canada and Japan review various aspects, the pathophysiological basis of topical steroid treatment and clinical assessment in children and in adults suffering from asthma and rhinitis.

Morrow Brown in an historical review of these headings includes an account of the earlier failure with nebulized steroids in the 1950's to 1960's leading to a phase of doubt about this form of treatment now resolved by the introduction of more potent topical compounds.

In other chapters the topical pulmonary and nasal therapy is assessed in terms of side effects, dosage regimes both in adults and children, and a clear picture emerges of the use of these drugs.

The criticism that can be justifiably made of the overall presentation by all the authors is the very narrow and specific focus on topical steroids as a treatment of asthma. No overall attempt is made to relate topical steroid treatment in asthma to other modes of treatment—theophylline, B adrenergic and cromoglycate drugs. In their defence the authors have not intended a comprehensive account of treatment in asthma, but there is an inherent danger in this consideration of a single mode of treatment in a situation where a combination of drugs is the most effective approach.

Professor Clark has published previously an excellent textbook on asthma, and this present focus on topical treatment should be regarded as supplementary to that previous work. J.A.W.

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THIS short little book which can be read easily in a night will be of use to all housemen, but it is a little uneven in the sense that some of the chapters are excellent; others are not so good. Perhaps the greatest criticism is that there are practically no diagrams at all and these would be especially valuable in relation to the various procedures that are described. Nevertheless, it can be recommended. J.V-O

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THE twelfth edition of Tredgold's Mental Retardation reflects the increased knowledge of the causation of mental handicap and the changing concepts in the treatment, care and training of such individuals. Where previously this book was mainly medical in authorship, it has now, in it's twelfth edition, become multidisciplinary in presentation, and emphasises the greater involvement in the care of the mentally handicapped of professionals other than medical practitioners. With such a diverse body of professionals it is natural that each will put forward their own particular point of view and ride their own particular hobby-horse. This is not altogether a bad thing except that in some sections the point of view of a particular discipline is difficult to comprehend because of the terminology or jargon employed, and where other points of view are not considered or expressed.

The Clinical section of the book is by necessity presented in a condensed form but has many excellent illustrations of clinical types. There is, however, an annoying tendency to keep referring the reader to other chapters or pages where the subject mentioned is more fully discussed. There are some chapters in the Clinical section which could usefully be revised or omitted in subsequent editions.

The editor rightly points out that the contributors to this book come from three continents and the ideas expressed are internationally valid. There will however be a tendency for readers to select only those chapters which are relevant to his own particular scene, although he might have a passing interest of the practice in other countries. However, I found it heavy going in, for example, understanding and appreciating the North American View and the emerging constitutional issues there.

This is a useful book for the person interested in mental retardation and particularly for trainee psychiatrists. It gives a comprehensive picture of the whole field of mental retardation and the current philosophy of care, treatment and training by the multidisciplinary team approach. B.G.S.

LIVER BIOPSY INTERPRETATION. By Peter J. Scheuer. Third Edition. (Pp 260, Figs 160 b/w and 29 colour plates. £19.50). London: Baillière Tindall, 1980.

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The third edition has been expanded and the illustrations, both colour and black and white, are now placed adjoining the text allowing for easier consultation. The high quality of the illustrations is maintained and the additional figures are informative. A new chapter on liver disease in the alcoholic is introduced and many of the other chapters have been revised to allow incorporation of recent advances in liver disease. The chapter on biliary disease includes a section on cholestasis, and that on malformations and neoplasms includes liver cell nodules and their relationship to oral contraceptives. The more recently introduced histochemical procedures of use in diagnosis are included in the relevant chapters.

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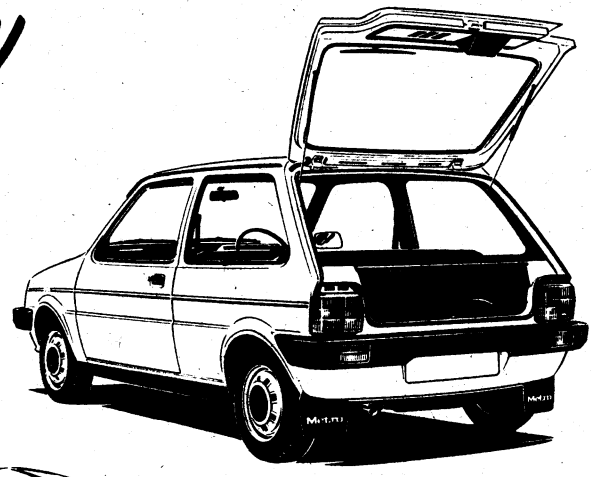

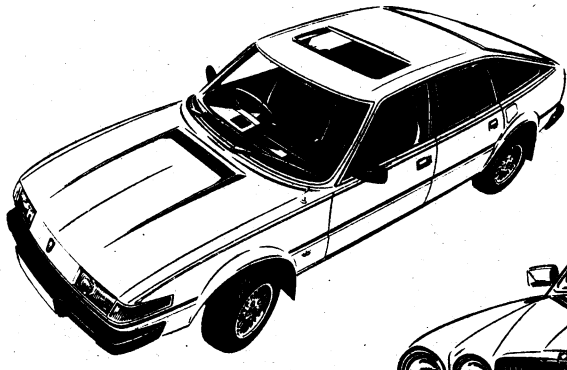

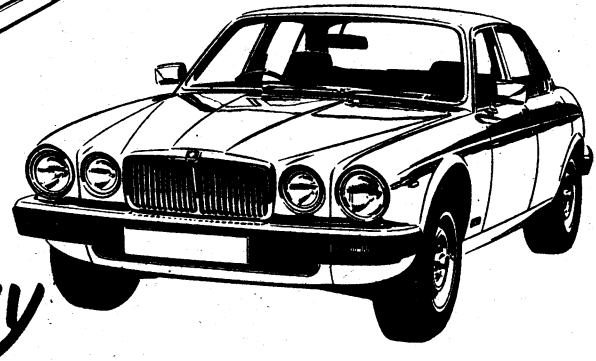

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