related to the fact that the infecting organism proved relatively resistant to penicillin and that it was not subjugated until the dosage was considerably increased. This patient received in all 15 mega units of penicillin.

Discussion

In this small investigation it appeared that infection was playing the major part in the aetiology of the condition, and that its control allowed recovery of the bone marrow, a recovery which further arsenic was unable to prevent.

In other conditions associated with granulopenia I have noticed serious deterioration as a result of superadded infection. A man convalescent from glandular fever sustained a streptococcal infection of his throat. His polymorphs promptly fell from 1,800 to 90 per c.mm., to rise again immediately the infection had been subdued by penicillin. A woman suffering from chronic lymphatic leukaemia developed gross infection in her mouth and throat. This resulted in a grave illness, with high fever, widespread purpura, and a rapid fall in the haemoglobin level, which reached 25%. Treatment with parenteral and intraoral penicillin rapidly overcame the infection, the fever fell to normal, the mouth lesions healed, the purpura vanished, and the haemoglobin began to rise, eventually reaching over 100%. She has remained well during six months' subsequent observation, though her blood picture is still, of course, that of chronic lymphatic leukaemia. In other cases of leukaemia acute and threatening episodes have been initiated by sepsis, the control of which has resulted in temporary improvement in the patient's condition.

There seems to be little doubt that a functionally damaged bone marrow is particularly vulnerable to the toxins resulting from sepsis. It is well known, for example, that infection can interfere with the full therapeutic effect of liver extract in the treatment of Addisonian anaemia.

The factors giving rise to neutropenia are doubtless multiple. In addition to the part played by leucotoxic drugs—and no one will challenge this factor—it seems that idiosyncrasy, sensitization, age, sex, and endocrine factors must all be taken into account. But it may well be that infection, which is, I believe, the only factor common to almost every case, is the most important of all. A recognition of this possibility is clearly of considerable therapeutic and preventive importance. It would seem wise to exclude sepsis in cases of rheumatoid arthritis and thyrotoxicosis before embarking upon treatment with gold or the thiouracils. At the same time patients undergoing treatment by any of the recognized leucotoxic drugs should be warned to avoid infection and to report the smallest infective process immediately. Printed instructions might be valuable from this point of view. It is doubtful if the white cell count is of any value in giving warning of white cell depression, and may even lead to a false sense of security.

It has always been said that the appearance of a blood dyscrasia while undergoing treatment by any of these drugs precludes for ever the use in such a patient of the particular material thought to have been causative. The observations recorded here suggest that this dictum may not need to be adhered to when there are indications for further administration of the offending preparation. McGibbon and Glyn-Hughes (1943) came to the same conclusion after describing a case of agranulocytosis following arsenic.

In 1942 a fulminating case of agranulocytosis under my care, following the use of sulphapyridine, was given after recovery 3 g. of the drug by intravenous injection. Frequent white cell counts made during the subsequent 48 hours revealed no fall in the number of granulocytes.

Conclusions

It is suggested that in conditions of serious neutropenia infection plays a predominant part; that in its prevention, while undergoing treatment with possibly leucotoxic drugs, avoidance of infection, both endogenous and exogenous, is of more importance than repeated blood examinations; and that in the treatment of the established condition attention should be centred upon the immediate arrest of the infective process by the free use of the most suitable specific drug, which at present is likely to be penicillin in most cases. It should be given in large doses, in the region of 1 mega unit daily. In these circumstances pentide, blood transfusion, etc., may with advantage be withheld during the first 72 hours. If there has been no response at this stage pentide should be started and continued until response is well established. Fresh blood, folic acid, pyridoxin, ascorbic acid, liver extract, and thyroid may all be useful in individual cases. Where there has been satisfactory response to penicillin alone it may be possible to resume the supposedly leucotoxic drug, if necessary.

My thanks are due to the Director-General, Army Medical Services, for permission to publish this paper, and to Brigadier F. J. O'Meara, Consulting Physician, B.A.O.R., Colonel C. A. Gavan Duffy, Officer Commanding Medical Division, 94th (Hamburg) British Military Hospital, Colonel F. E. Buckland, Director of Pathological Services, B.A.O.R., and Captain W. T. Hendry, for their interest and help in this investigation.

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INSTRUCTION OF THE MEDICAL STUDENT IN PAEDIATRICS

AN INSIGHT INTO FAMILY PRACTICE

BY

W. S. CRAIG, M.D., F.R.C.P.Ed., M.R.C.P.
F. CHARLOTTE NAISH, M.D.

AND

M. F. G. BUCHANAN, M.B., Ch.B.Ed., D.C.H.

Instruction of the medical student is concerned primarily with the training of the future family doctor. Undergraduate training suffers from having to be provided under conditions dominated by hospital considerations of disease. As a result the recently qualified doctor entering general practice has to adjust his outlook. He is not long in practice before he realizes that many of the problems which appeared simple of solution when seen in hospital are complex when considered in relation to the needs of the home. Short of restoring the old-time apprenticeship system it is difficult to see how this handicap can be completely offset.

The handicap applies particularly to undergraduate study of health and disease in infancy and childhood. Ward instruction is deficient because of the absence of the mother and of any visual reminder of home conditions. The

deficiency is made good in part, but only in part, by teaching in hospital out-patient departments, at infant-welfare sessions, and at school medical inspections. These sessions, no matter how efficiently they are run, are apt to suffer from a routine intended to cope with a considerable number of children in a set period of time. Health and disease in childhood are studied in an atmosphere of organized efficiency rather than one of intimacy of understanding. The student is left with an impression of a limitless tide of "cases," some of interest, others of doubtful interest. The tide is apt to flow with such speed that in his concern over physical findings the student is insufficiently impressed by the human family problem presented by each child. Nor can the hospital clinician, be he ever so able a teacher, convey to the students that full depth of understanding of mother and child and family circle which makes for successful care of child life in general practice.

Experiment at Leeds

The medical student taking out his course of clinical instruction in paediatrics and child health at the University of Leeds is given opportunities of seeing healthy and ailing children in hospitals and at clinics, handicapped and "deprived" children in day and residential homes, and some of the homes from which sick children have been admitted for treatment in hospital wards. In the course of his studies the same student meets practitioners on the visiting staffs of hospitals and in the employ of local authority child-health services, nurses working in hospital or as health visitors, school nurses, and district nurses or district midwives. He is given a didactic lecture by a family doctor on the theme of paediatrics as met with in general practice, but until recently has not seen the family doctor at work.

We are convinced that the family doctor has a vital part to play in care of the child in health and disease. We are equally convinced that training of the future doctor in paediatric care would derive immeasurable benefit from early insight into such care as is provided in the course of everyday general practice. Ourselves (W.S.C. and F.C.N.) brought up from childhood in the households of family doctors, we are acutely aware in our professional work to-day of the debt we owe to that privileged experience of the past. Over a number of years one of us (F.C.N.) has made a special study of infants and children seen in the course of day-to-day family practice. Study pointed to the desirability of expanding the range of service offered to mothers and children in practice. One way in which expansion was developed was to reserve an afternoon each week for consultations for mothers and their children. In effect a clinic was established as an integral part of the activities of the family practice. The clinic proved a success from the start and has now run uninterruptedly for almost two years. There is implied recognition of its value in the authority recently given by the local executive council to continue the established policy of reserving one afternoon each week for mothers and children.

We felt that the training in paediatrics of the future general practitioner would benefit by insight into the work of a clinic conditioned by the circumstances of family practice. Experimental arrangements were therefore made to enable students, while attached to the University Department of Paediatrics and Child Health, to visit the clinic. We are satisfied that the arrangements have proved their value. The purpose of this paper is to give an outline of the arrangements and their results, because it is considered they indicate means whereby undergraduate, and indeed postgraduate, instruction of the medical student can be widened and improved.

The General Practice

The practice is one of a number in a non-university city with an approximate population of 100,000. The bulk of the work is concerned with the families of manual labourers, clerical workers, and shop employees. Of other persons on the practice list a small number are members of professional and military families. Midwifery constitutes an important part of the activities of the practice, and in the matter of social groups reflects the distribution characteristic of the practice as a whole.

The Clinic

The clinic is held in the family doctor's private house, which is situated in a working-class district. Accommodation consists of a weighing-cum-secretarial room, a waiting-room, and a consulting-room with screened examination couch. The accommodation is in fact the "surgery." Furnishings include low seats suited to use by nursing mothers.

Sessions are held weekly. The family doctor (F.C.N.) has the assistance of a secretary and nurse, and has recently been offered the services of a health visitor by the maternity and child-welfare authority. Attendance is on a voluntary basis and by appointment. Mothers who attend with their babies consist of those delivered by the doctor, of those who are on the doctor's National Health Service list but who have been delivered in hospital or by a midwife, and a few referred by the doctor's partners in the family practice. Of newly born infants in the practice approximately 80% attend the clinic. Mothers are advised to attend weekly until the baby is 3 months old, fortnightly during the next three months, and thereafter at monthly intervals until the baby reaches his first birthday. Older children attend at longer intervals or at any time, prior to school age, when their mothers wish advice on account of any difficulties in upbringing.

Attendances average twenty-six a session. All children are weighed, and individual records are kept on separate cards. Duplicate cards are kept by the mothers. At any one session rather more than 50% of those attending are seen personally by the doctor at the request of the mother, at the instigation of the nurse, or in accordance with arrangements made by the doctor at the time of a previous visit.

Work of the Clinic.—The ages of children attending range from a few weeks to 5 years. Infants predominate. All children are accompanied by their mothers, who know that they must not bring any child thought to be incubating or harbouring infection. It is one of the objects of the clinic not to divorce care of the infant from care of the mother or family. Health and disease are not arbitrarily differentiated. General management, the promotion of health, and the prevention of disease receive equal attention. The indications for consultations arise from an infinite variety of circumstances. They include comprehensive routine inspections; the supervision of infant feeding, whether breast, complementary, or wholly artificial; attendance for vaccination or immunization; requests for advice concerning symptoms which, were there not a clinic, might be ignored; family problems such as those arising from ill-health of the mother or from enuresis on the part of the child; and social problems such as those concerned with adoption and illegitimacy.

Arrangements for Medical Students

Attendance at the clinic is entirely voluntary. Provision is made for three students accompanied by a registrar (M.F.G.B.) to be present at each session. A number of

factors, including those related to distance and transport, make it impossible to arrange for any one student to be present at more than one session. At the time of his visit the student is encouraged to discuss the individual problems he has seen and any general considerations which particularly interest him.

All students have taken advantage of the opportunities offered them. They know they are taking part in an educational experiment. No attempt has been made to influence them in their views, and particular care has been taken not to initiate comparisons concerning different services for the care of child life. The students have willingly co-operated when asked after their visit to give a written account not so much of their impressions concerning detail as of their reactions to inclusion of the visit in the course of their training.

The Student's Reaction

A point of practical importance is that at no time has there been any unfavourable reaction to the presence of students on the part of mothers attending the clinic. As to the students themselves, while some few were constructively critical of certain aspects of the arrangements made for them, all testified to the value of their visits to the clinic. Many were unreservedly enthusiastic. Significance attaches to the reasons given for their opinions.

Almost all the students stressed that the visits had given them their first opportunity to "see general practice in operation." Of those who made this comment a number wrote of having appreciated for the first time the part which the family doctor can play in the care of child life in health and disease. Reading their remarks, it is evident that a number of students had had borne in on them how many of the children they see in the hospital out-patient department could be properly dealt with in the more suitable environment of a family doctor's consulting-room. Others, again, were impressed by seeing conditions which are rarely encountered in hospital but which, although they may have no serious immediate clinical significance, bulk more largely in general practice.

Most of the students remarked upon the advantages to child care of the mutual understanding and trust which it is within the power of the general practitioner to establish with the families he attends. Other students appreciated the initial advantage possessed by the family doctor whose care of children starts in the form of antenatal supervision of the mothers and who knows the background and capabilities of families in his practice. A number of students, men and women, sensed the benefits to infant feeding of supervision being undertaken by a doctor herself the mother of a family. Women among the students realized that marriage and a family do not necessarily debar a woman from making a vital and special contribution to child care in general practice.

We consider that the various views expressed by those visiting the clinic support the opinion that the experiment has justified itself. Evidence in favour of this opinion is to be found from the following extracts from notes sent in by three of the students who have taken part in the experiment. Telling of his outlook before visiting the clinic, one student wrote: "As a medical student one of the impressions I had conceived of general practice was that any case which required a little more trouble taken over it than normal was immediately referred, especially in paediatrics, to the already overworked hospital."

Another student wrote: "It [the visit] helped my sense of proportion in realizing the great value of the general practitioner in the promotion of child health." A third student summed up his impressions as follows: "The visit

made me realize that general practice is not static and can be made progressive . . . and can provide intellectual satisfaction."

Summary

Measures for the care of child life must be based upon the home. The family doctor has a vital part to play in any such measures. If it is to fulfil its primary function medical training of the undergraduate must be directed towards preparation for family practice. Teaching instruction in the care of child life is handicapped by difficulties in the way of giving the medical student practical insight into conditions prevailing in family practice.

An educational experiment is described which is intended to offset these difficulties in part at least. It is considered that the experiment has been a success, is capable of further development, and might be extended to a wider field of medical training than that concerned solely with health and disease in childhood.

INTERMENSTRUAL PAIN (THE "MITTEL-SCHMERZ") AND THE TIME OF OVULATION

BY

P. L. KROHN, B.M., B.Ch.

(From the Department of Anatomy, the Medical School, Birmingham University)

Cyclically recurring pain in the pelvis which can be related to the phases of the menstrual cycle is not uncommon in women. The condition was described by Priestley as long ago as 1872, although it is just possible that his observations were confused by the coexistence in his patients of chronic appendicitis, which at the time he wrote had not been defined as a clinical entity. Subsequent reports, in which corresponding pelvic pains have been referred to, mainly concern acute conditions that have called for operation, and in many instances laparotomy at the time of the pain has disclosed a recently ruptured ovarian follicle.

The periodicity of intermenstrual pelvic pain is one of the many signs that have been taken to indicate the time of ovulation in women. In view of the very clear-cut symptoms over a long period it is of interest to report the following case history.

Description of Present Case

The patient is a married woman aged 28 in whom cyclical intermenstrual pain has been recorded without interruption during the last 4½ years. It has occurred over at least seven years, but at first it was irregular. She has no recollection of similar pains before the age of about 16.

The pain is characteristic and easily recognized. It lasts for no more than 24 hours, and varies somewhat in intensity from time to time. It is never severe and can be controlled with simple analgesics. It begins suddenly in one or other iliac fossa and is gradually referred to the pubes, from which it spreads as a generalized pelvic pain.

The occurrence of the pain and the menstrual periods from April, 1944, to November, 1948, are charted in Fig. 1. The Table shows the duration of the two "phases" of the cycle. The following points may be noted.

Table Showing Distribution of Duration of Phases of Menstrual Cycle

	Duration in Days														
	10	11	12	13	14	15	16	17	18	19	20	24	25		
1st day of menstruation to mittelschmerz					1	6	8	13	6	4	2	2	2		
Mittelschmerz to onset of menstruation	1		10	22	7	1	1								