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CONTENTS

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Editorial

The M.M.A. House

by A. A. Sandosham

WITHOUT DOUBT, the greatest single achievement of the Malaysian Medical Association since its foundation 13 years ago has been the erection of Bangunan MMA which was declared open by our Prime Minister, YAB Tun Haji Abdul Razak bin Datuk Hussein, S.M.N., K.O.M., on 6th April, 1973, the laying of the Foundation Stone having been performed on 5th March, 1972, by YAB Tun Dr. Ismail Al-Haj bin Datuk Haji Abdul Rahman, the Deputy Prime Minister, himself a Life Member of our Association. We were particularly happy that the Official Opening Ceremony of MMA House was also witnessed by the illustrious foreign Delegates and Observers from Australia, Hongkong, Indonesia, Japan, Korea, Philippines and Singapore who were then attending the 8th Congress of the Confederation of Medical Associations in Asia and Oceania which was hosted this year by M.M.A.

As can well be imagined, the Association owes a debt of gratitude to the many people, members and non-members alike, for the part they played in conceiving the idea and bringing it to fruition. They are too many to be enumerated in full but it gives us pleasure to place on record the names of a few of those who have been especially instrumental in helping us attain our goal.

The idea of an MMA House was first mooted by the first Council of MMA under the presidentship of Dr. S.G. Rajahram, which set aside for building our headquarters the sum of $18,134.00 generously handed over by our predecessor, the Malaya Branch of the British Medical Association. Among the early advocates of a building really worthy of the profession, despite the scepticism of some of us, were Dr. S. Parampalam, our Hon. General Secretary for several years; Dr. Tan Chee Khoon, a former President; and Datuk Dr. P.T. Arasu, the Chairman of the House Committee, who with the backing of the Ministry of Health, managed to persuade the State Government to alienate

26,800 square feet of land opposite the entrance to the General Hospital at nominal cost; and Mr. Lim Jo Yan, of the Overseas Chinese Banking Corporation, to give us the necessary overdraft. Datuk Dr. P.T. Arasu, together with Dr. S.G. Rajahram, Dr. Chong Yew Chong and Datuk Dr. Abdul Majid bin Ismail, as the Trustees of the MMA House, laudably accepted personal liability for the sum involved in building till everything was settled.

The MMA Hon. General Secretary, Dr. Pius Martin, and Hon. General Treasurer, Dr. Syed Mahmood bin Syed Hussain, acted as secretary and treasurer of the House Committee as well.

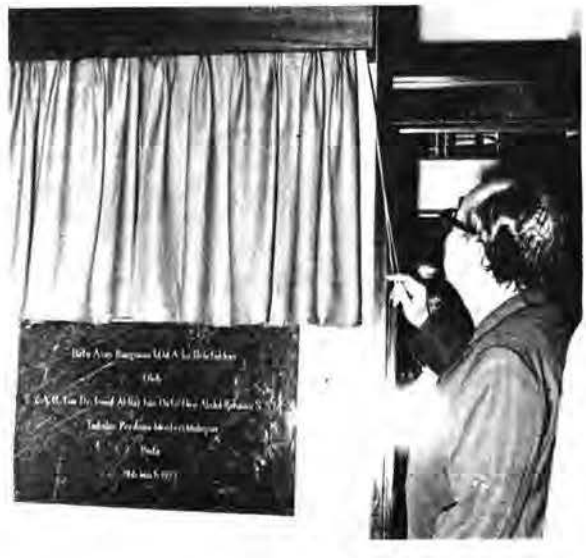
Although there were some generous donations from members who did not stand to gain in any way, the total sum to the credit of the MMA House Fund was too low until Dr. Lim Chong Eu introduced the idea of Life Membership subscription as a means of augmenting our funds. When this was also found flagging, Y.B. Tun Tan Siew Sin, the Minister of Finance, came to our rescue by giving life members income-tax rebate for a period of three years on their payment of $1,000.

The Association was fortunate also in having as its architect Mr. Tham Chan Wah of Messrs Hoh Tham and Partners. His genial personality and his patience at the meetings of the Council and House Committee during the chopping and churning of the Building Plan were greatly appreciated.

The MMA House is a compact 6-storey structure built at a cost of about $750,000 in close proximity to the General Hospital, Kuala Lumpur, and the Institute for Medical Research. Part of the fourth floor has been reserved for the MMA secretariat and the conference room cum library. The top floor consists of 14 self-contained flats of which two have been reserved for outstation MMA members at a nominal daily rental. The pressing need now is to rent out all other accommodation to help maintain the premises and pay back the bank overdraft as quickly as possible and release the mortgage. This will absolve the Trustees of their personal responsibilities they have undertaken, and the management of the MMA House could then be transferred by the House Committee to the Council of MMA.

When that has been achieved, it is proposed to persuade other medical organisations, like the Academy of Medicine and the College of Surgeons, to move into the MMA House and to extend to them as far as possible such facilities of the MMA secretariat that they may wish to use. In this way, it is hoped that the different bodies representing the various disciplines of medicine could work together with MMA and enable the profession as a whole to speak with one voice for the benefit of members, the government and the public. It is also envisaged that in due course we will be able to erect on the roof a conference hall to seat about 300 people for the use of the Association and other bodies.

Thus, the MMA may now claim to have its headquarters in premises befitting its status and that it can look forward to playing a greater role in building a united Malaysian nation as embodied in its Constitution.



(above): Y.A.B. Tun Dr. Ismail Al-Haj bin Datuk Jahi Abdul Rahman, the Deputy Prime Minister, lays the foundation stone of M.M.A. House. Looking on (from left) are Dr. Pius Marin, Dr. V. Thuraisingham and Mr. Tham Chan Wah.
(right): Y.A.B. Tun Haji Abdul Razak bin Datuk Hussein, the Prime Minister, declares open M.M.A. House.

Collapse as a medical emergency

by Donal R. O'Holohan
MB, FRCP (Ireland)

Paper read at the Clinical Meeting of the Negri Sembilan Medical and Dental Practitioners' Society on Friday, December 15, 1972.

WHILE THE TITLE of this short paper embraces a very wide field of medicine, I feel I must at the outset make it clear that the title should really read "Iatrogenic causes of collapse in medical practice". This immediately narrows the field to encompass the problem of the patient who collapses, faints or otherwise suffers an impairment of consciousness **as a direct result** of treatment administered by us as medical practitioners or by our agents. The problems which immediately present themselves must be faced and dealt with without delay whether this occurs in a hospital, nursing home, private clinic or on a domiciliary visit. I will conclude these opening remarks by presenting you with an unpleasant fact of life which should be uppermost in your minds throughout this article and in your daily practice. When it comes to medical mishaps, the difference between the hospital doctor and the private physician is that the former (to a great extent, at least) enjoys and is protected by corporative responsibility while the latter is solely responsible for the results of his actions. As with the American President, in the immortal words of Harry S. Truman, "The buck stops here" — so with the private practitioner.

I do not think it is necessary to elaborate on a definition of collapse — when it happens it is only too obvious. But for the sake of completeness and in the light of what is to follow, let us include the whole spectrum from the subjective sensation of unease as felt by the patient to the ultimate, dramatic and sudden loss of consciousness which follows immediately upon medication administered by the physician.

Let us first deal with the possible causes of patients collapsing or threatening to do so after medication.

It is common experience that many patients complain of giddiness, or faintness, immediately after an injection, some even before the piston of the syringe is pushed home. This most often occurs

if the patient is standing or sitting and is commonest in adolescent males. It is unwise to give an injection to a patient other than in the lying position. Sooner or later, a nervous individual will topple over and injure himself in falling. This is a simple vaso-vagal syncope or faint. It is a wise precaution to insist on (especially new) patients lying down for any injection (other than vaccination) and resting for a few minutes before getting up. It is wise to **ask** the patients if they feel light-headed or giddy. It is better to ask them than to suffer the embarrassment of having the patient brought back to your office in a faint some minutes later. I stress this seemingly trivial point because injections are so commonplace (and in demand) in this country that we tend to take them lightly. If you miss a simple syncope and are presented with it some minutes later, you may mistakenly be alarmed into thinking that you have a case of allergic shock on your hands. In my personal experience, this is the commonest cause of faintness or collapse and it is the injection rather than the medication which causes it.

Next in frequency as a cause of faintness or collapse is the specific effect of a drug upon the central nervous system, the autonomic nervous system or the cardiovascular system. I am still not referring to the phenomenon of allergy, which will come later. While there are patients who will exhibit idiosyncrasy to common drugs (without previous warning) there are drugs which can be predicted to cause upset in even the most normal of subjects. Such drugs may cause sudden orthostatic hypotension, vagal stimulation or arrest, cardiac arrhythmias or arrest or autonomic nervous system disorder. These effects are due to their inherent pharmacological properties but may be more marked in certain individuals or certain diseased states. I will not attempt (nor is there time to do so) to elaborate beyond saying that it is axiomatic in therapeutics that the physician should know the properties of the drug he is using.

I will, however, with apologies if I give the impression of belabouring the point, mention a few drugs in common use which, while they are safe and desirable to use in certain indications, require a little forethought before giving parenterally.

Largactil in outpatient practice, if given by injection, can cause profound hypotension and prostration. What is disconcerting is that this may not come on for 15 to 30 minutes after the injection.

Likewise **Hydergine,** but in the case of this drug, the hypotensive phase is transitory and if the patient is made to lie supine for at least 15 minutes, there is no subsequent postural hypotension.

Parenteral **Quinine** can safely be given to an outpatient if he is kept supine for 10-15 minutes. I have given this drug by intra-muscular injection to well over a thousand patients without mishap, but they all had to rest for 10-15 minutes.

Intravenous Calcium is very commonly used in this country (even by the quacks!) and it is well to remember that cardiac arrest can result if the patient is taking digitalis — I know of patients taking digitalis preparations from unqualified persons and they may not volunteer this to the physician. **Ask** if they are taking **any** drugs for their heart before giving intravenous calcium.

I have four personal rules for intravenous therapy:

1. Only use it if there is no alternative.
2. Always use a disposable syringe (to avoid residues of possible allergens in a resterilised needle).
3. Insist on the patient lying supine for at least ten minutes.
4. Time the injection with a watch and stop at intervals to see if there are side effects.

Exercise extreme caution in the use of parenteral Chloroquine, especially in children. Chloroquine can cause sudden, fatal vasomotor collapse and cases are on record (Martindale). I personally know of two fatal collapses in young children within the past two years after intra-muscular Chloroquine and what makes it doubly tragic is that in neither case had the blood been examined for the malaria parasite.

In our second group, we spoke of collapse due to the pharmacological properties of the drug used and ill results possibly following neglect to bear these properties in mind but our last group is the one which is probably the most pertinent to our article — allergic collapse, including anaphylaxis.

I have probably strained your patience with what may have appeared a lengthy prologue or even an irrelevance. However, I do not think so. We must put allergy and allergic reactions in their proper perspective — they are but a part of the spectrum and not necessarily the most common but they are indeed the most frightening and, at times only, the most serious.

For the sake of brevity, we will classify allergic reactions as immediate, delayed and remote. We will only consider the first two here. In everyday practice, the substances we are most likely to use which cause allergy are the pencillins, some of the related compounds and the sulphonamides. The only common serum to cause trouble is Anti-Tetanus Serum (A.T.S.). There are others but not

in every day or casual use. One final substance is Vitamin B^1 or Thiamine. It is not always certain that the reaction to this substance (which can be suddenly fatal) is purely allergic or due to vasomotor collapse. In some cases of collapse after B Complex injection, it may be the nicotinic acid fraction which causes widespread vasodilation and collapse.

Having discussed the causes, let us now consider treatment. Treatment, of course, will depend on recognition of which phenomenon is taking place. Is it vaso-vagal syncope, is it vasomotor collapse or is it anaphylaxis immediate or delayed? It may appear sententious to restate a universal principle that prevention is better than cure but sententious or not, it is true.

If an injection is called for (leave aside A.T.S. and penicillin for the present) ask yourself is it essential? If you are dubious about the patient's tolerance of a specific substance or even the necessity of giving it parenterally, then suggest an injection is not necessary. If the patient insists upon an injection and your experience tells you that without the injection his faith in the rest of the procedures will be impaired, then give something that will do no harm, even some good, such as pure cyanocobalamin (B 12) or even an antihistamine. If you wish to use a specific drug which normally has no known side effects, find out how he responds to injections (i.e., is he nervous, does he get giddy?) and make him take it lying down. Use sharp, good needles. If there is a history of allergy, use disposable syringes. Be careful to aspirate before injecting to avoid injecting into a vein. When giving intravenous injections, always use disposable syringes, fresh phials (avoid multidose vials) and inject slowly. Make the patient lie supine for 10-15 minutes. However, if you wish to avoid trouble, the best way is not to look for it Do not give injections which have a reputation for trouble and do not inject patients with a history of accident after previous injections. Do enquire closely as to a patient's history of allergies, asthma, urticaria and food intolerances. Such histories can be most significant.

Let us now deal briefly with the three major causes of catastrophe in medical (both hospital and private) practice, i.e. A.T.S., Penicillin and Vitamin B 1.

As to A.T.S. — there is always time to think before giving it. There is no emergency — except in cases of doctors far from hospitals. In any case, A.T.S. is given far too often for trivial reasons, minor scratches and abrasions. If you **must** give it, do a careful skin test (0.02 cc.) intradermally. Wait a full half-hour and if no reaction, wait another full half-hour before releasing the patient.

I never give parenteral penicillin. I know of no emergency where penicillin must be given. It is still undoubtedly the most widely useful, cheap, effective and (statistically) safe antibiotic. I say statistically because the number of fatal reactions (immediate) which occur when compared with the, possibly, billions of injections which have been given, are infinitesimally small. But such statistics are of little consolation to you or to the relatives if a fatal reaction takes place. One penicillin injection can hardly be life saving today, (with so many available alternative antibiotics) so why take the risk? If you feel he needs a course of penicillin injections, send him to the hospital for a sensitivity test and treatment. Please remember that while a coroner may be most particular in ascertaining whether a skin test was performed and **a suitable time limit allowed to pass** to ascertain a positive or negative reaction, these tests are often not only invalid but people have died in anaphylaxis after a single drop of penicillin has been installed into the conjunctiva to detect allergy. If you must use penicillin injections in private practice, at least cover yourself by the skin test and at least half an hour to read the result. My advice is: do not use penicillin injections in private practice. People in hospital may smile at this caution but remember when a patient in the hospital is ordered a penicillin test and injection, it passes down the chain of command and if there is a reaction, the corporate responsibility comes into force and the, truly, regrettable incident is forgotten in the mass of patients which pass through the hospital. If it happens in your office, it will be remembered for a long time that Dr. X killed a patient with an injection. Sad but true.

The only serious and near fatal reactions to injection that I have had in nearly 20 years have all been due to Vitamin B. I know of others less fortunate. Again, like penicillin, it is used in vast quantities without ill effects, but if you wish to avoid trouble be wary of it. There is an almost superstitious regard in this country for the properties of Vitamin B complex, both on the part of the laity and the profession. I feel much of it is due to the rapid beneficial effect in patients suffering from malnutrition immediately after the Pacific War. Patients speak of Vitamin B complex the way they still speak, in the kampongs at least, of M & B — the cure of all illness.

Treatment

Treatment depends on recognition of the condition. The vaso-vagal syncope, often quite profound, is recognised by the sudden pallor of the patient, coldness of the extremities, bradycardia (sometimes tachycardia), light sweating and the quite literal swooning away. Put the patient flat on his back, no pillow, raise his legs (knees straight) at right angles to his body. He usually recovers fast but may feel giddy for some time if he gets up. No other treatment is usually necessary. This pallor and giddiness may persist for one hour.

Hypotension from vaso depressor drugs will usually respond to the same treatment but if the effect is profound longer supination is required. If the blood pressure does not quickly return to at least 100 mm. systolic, a parenteral injection of Aramine may be required.

Vasomotor collapse from drugs of the Vitamin B Group, Amidopyrine, or too rapid injection of parenteral iron is characterised by profound collapse, loss of pulse, greenish pallor, and literally drenching sweat which forms pools of water on the floor, air hunger and, may be, incontinence of urine and faeces. This is a real emergency which requires rapid treatment. First, as always, put the patient flat with the head low, if possible. Raise the feet to a right angle with the body (have an assistant keep the legs in this position). See the air way is clear. Listen for a heart beat. It may be very faint. If you have oxygen, give it preferably with a resuscitator (failing this, give mouth-to-mouth respiration if the respiration is failing). If you can get a vein, give intravenous hydrocortisone or dexamethasone. Follow this with Aramine. If you cannot get a vein, do not waste time but give Aramine and Dexamethasone into the trapezius muscle over the shoulder where the central circulation is more likely to be still active. These measures usually work. I would stress in most cases the manoeuvre of supinating the patient with the legs held high is the most immediate, important and practical. Above all in such cases (including allergy to follow), do not resort to bundling the patient into a car or an ambulance. In such dire emergencies, he is going to be saved by you or not at all. If immediate response is not rapid, treat, as in the following emergency, i.e. anaphylaxis.

Anaphylaxis and the Anaphylactoid Reactions

Anaphylaxis is an acute, often explosive, systemic reaction occurring in a previously sensitised person after receiving foreign serum, certain drugs or diagnostic agents, desensitising injections, or insect stings.

Anaphylactoid Reactions are clinically similar to anaphylaxis, but can occur after the **first** injection of certain drugs (histamine, polymixin, stilbamidine, contrast media and Vitamin B1 and some of the amidopyrine derivatives).

What happens in Anaphylaxis?

1. Sudden decrease in effective plasma volume due to acute vasodilatation and escape of plasma into the tissues.
2. Fluid escapes into the pulmonary alveoli and may produce pulmonary oedema.
3. There may be obstructive angio oedema of the upper air ways.
4. In a prolonged reaction, myocarditis may occur. (Death in such cases is due to cardiac arrest or ventricular tachycardia — the moral is swift treatment to prevent this stage being reached.)

Symptoms and Signs of an Anaphylactic Reaction

1. The symptoms may come on between one to 15 minutes.
2. The patient complains of generalised discomfort, is agitated and becomes flushed.
3. Palpitations, parasthesiae, throbbing head and ears, pruritus, tingling sensation, tight chest, coughing, sneezing and dyspnea are common complaints.
4. Within one or two minutes, the full blown picture of shock may be present.
5. At this stage, the patient may be incontinent and have convulsions.
6. The next stage is lack of response.
7. Death.

All of these stages are very rapid and if you have not taken vigorous action by at least stage '5', you are probably too late.

Diagnosis

The diagnosis must be made before shock develops (i.e. when a patient has **any** reaction to a drug always **anticipate** Anaphylaxis). First and foremost, the patient with anaphylaxis is **flushed** and has a **rapid** pulse in contrast to the patient with vaso-vagal syncope who develops pallor and bradycardia.

Treatment

A rapid diagnosis and early treatment increase the chances of preventing shock developing. If the reaction is apparently mild, give Adrenaline 0.3 ml. by subcutaneous injection. (It is understood that the patient is always put lying flat, legs raised, clear air way). Mild or not, prepare for the worst! Have 0.5 ml. of Adrenaline loaded and mixed with

10 ml. of normal saline, **ready** for intravenous (**slow**) injection, if necessary. Have a saline transfusion ready for use, Metaraminol and Dexamethasone available for rapid loading and injection and, if possible, oxygen and an air way.

Now here is the crux of the matter. Apart from possible oedema of the air way, what is going to kill your patient is shock. **Do not let it develop.**

If the immediate measures of supination, elevation of the legs and subcutaneous Adrenaline do not produce **immediate improvement** (or if the reaction is severe from the outset or if the reaction took place after the patient has left the office and is already in shock when you see him) then treat for shock.

While an assistant is rapidly assembling the saline transfusion, give Adrenaline 0.5 ml. in 10 cc. normal saline **intravenously,** slowly. Follow or accompany this by setting up a rapid inflow of saline (or a volume expander such as Haemaccel). The best treatment of shock is rapid fluid replacement — saline can be quite adequate for if the venous pressure is rapidly restored, then cardiac output and arterial pressure will rise at the same time. Do not rely on pressor drugs alone to raise the blood pressure for without a rapid replacement of fluid at the same time, you are literally flogging a dead horse. Give the pressor substance **with** the fluid replacement, i.e., slow injection of Metaraminol (Aramine) 0.5 mg. to 5 mg.

There are those who question the value of intravenous corticosteroid in the critical first few minutes. However, provided their use does not delay other immediate and essential treatment (above), they should be used as they do no harm and possibly shorten the total duration of the reaction. Use Hydrocortisone succinate 200 mg. or Dexamethasone 8 mg. by intravenous injection.

Once the pressure has returned to normal, the crisis is usually over but as there may be delayed reactions to come, it is better to put the patient in hospital.

Now all the above measures are eminently practicable in any doctor's office but as this emergency leaves no time for searching for your resuscitating materials, have them at hand always. If you have not done so yet, do so first thing tomorrow.

The emergency tray or trolley should have the following: —

1. Disposable sterile syringes, 2 cc., 5 cc., 10 cc. .
2. Adrenaline ampoules (1 in a 1000 strength.)
3. A plastic, disposable transfusion set of normal saline or glucose saline.
4. A similar set of a volume expander, such as Haemaccel.
5. Ampoules of Aramine.
6. Ampoules of Dexamethasone or Hydrocortisone.
7. Ampoules of Antihistamine.
8. An air way.

I would add that I believe every doctor should have oxygen equipment standing at the ready in the consultation room. For rapid emergency treatment, a "minuteman" resuscitator, which will breathe for the patient, is ideal.

Apart from the oxygen equipment, all the above are inexpensive items — their value lies in the speed with which they are used and their ready availability to hand in an emergency.

To conclude, it is useful (in fact, essential) to train the more reliable members of your staff in how to act in such an emergency by several "mock" emergencies. Train the staff to recognise the incipient collapse, to supinate the patient while rapidly alerting you or a colleague. Drop everything to attend to this emergency. Be tolerant of false alarms for if a nervous employee calls wolf too often, it will not be he or she who is bitten but the patient (and therefore you yourself).

References

Martindale (1967) Extra Pharmacopoeia. P. 316.

Suggested for Emergency Tray:

1. **Aramine** (Merck Sharp & Dohme) Metaraminol bitartrate 10 mg./cc.
2. **Oradexon** (Organon) Dexamethasone Sodium Phosphate, 5 mg./1cc. or **Decadron** (Merck Sharp & Dohme) Dexamethasone Sodium Phosphate, 4 mg./1 cc. (2 cc. vial).
3. **Solu-Cortef** (Upjohn) Hydrocortisone Sodium Hemisuccinate, 100 mg. in mix-o-vial for instant intravenous use.
4. **Haemaccel** (Hoechst Malaysia) Plasma volume substitute. 500 ml. in disposable infusion set.
5. **Steriflex** No. 3 or No. 6 (Allan & Hanburys) Sodium Chloride and Dextrose or Dextrose 5% in disposable plastic infusion set.
6. **"Minuteman"** Resuscitator — Malayan Oxygen Ltd.

Hematological values in pregnancy in Orang Asli (Aboriginal) women

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THE CONCEPT OF "physiological anemia in pregnancy" stems from the fact that in pregnancy, a greater increase in plasma volume as compared to increase in red cell volume leads to hemodilution. Therefore there is seen a gradual and progressive fall in hemoglobin values as pregnancy advances; this fall is preventable by providing hematinic supplements to the pregnant mother. *Kwa and Ko*[1] in Singapore, studying 1,000 antenatal mothers, found a fall in the mean hemoglobin level from the 9th week to the 36th week of gestation, with a rise after that till term. A similar trend was observed with the hematocrit (PCV) and mean corpuscular hemoglobin concentration (MCHC). Other authors have found similar trends[4,5].

A knowledge of these hematological values and trends in a rural population would prove useful towards management of pregnant mothers and planning of maternal health services. A study was carried out in the Orang Asli (aboriginal) Hospital, Gombak, Selangor, to study the hemoglobin level, PCV and MCHC values in pregnancy in Orang Asli women, basically a rural population; and the influence of gravidity and location of settlements upon these values.

Materials and Methods

The Orang Asli Hospital, Gombak, being the only hospital for Orang Aslis (Aborigines) in Malaysia accepts patients from all over West Malaysia. The obstetric unit, being in its early stages, sees mainly normal pregnant mothers, brought in to accustom the Orang Asli women to hospital care and delivery.

A total of 278 pregnant mothers, seen at their first antenatal visit from 18.6.71 to 2.6.72, were included in the survey. Venous blood was drawn from each patient for determination of hemoglobin,

Table I. Mean Values and Standard Deviations for Hemoglobin, PCV and MCHC in Pregnancy in Orang Asli women with relation to Gestational Period.

Gestation in weeks	No. of patients	Mean HB Gm%	S.D.	Mean PCV%	S.D.	Mean MCHC%	S.D.
0—	—	—	—	—	—	—	—
4—	1	11.3	—	35.0	—	32.0	—
8—	1	11.2	—	34.0	—	33.0	—
12—	1	13.2	—	41.0	—	32.0	—
16—	4	11.2	1.99	33.0	3.24	33.7	1.09
20—	18	11.4	1.36	34.6	3.81	33.0	1.54
24—	27	10.6	2.05	32.6	5.44	32.2	1.83
28—	55	10.9	1.81	33.4	5.40	32.1	1.89
32—	77	10.5	1.99	32.7	4.68	31.8	2.25
36—40	94	11.3	1.68	35.0	4.74	32.1	1.64
Overall	278	10.9	5.97	33.8	5.02	32.1	2.26

PCV and MCHC values. The hemoglobin was determined by the cyanhemoglobin method, using the spectrophotometer, and the PCV by the microcapillary technique.

Broadly, Orang Aslis can be divided into two groups, the deep jungle population and the "outside" population consisting of the jungle fringe settlements and those near towns or villages. This was done for Table III.

Results

Table I shows the relationship of mean values for hemoglobin, PCV and MCHC to gestational periods. There is a suggestion that after the 20th week, the hemoglobin falls till the 36th week after which there is a rise till term. There is, however, no similar trend in PCV and MCHC values.

The overall values for hemoglobin, PCV and MCHC are fairly low, being 10.9 Gm%, 33.8% and 32.1% respectively; with ranges of values from 4.1 to 17.7 Gm%, 14.0 to 56.0% and 25.0 to 36.0% respectively.

In *Table II*, there is suggestion of a fall in hemoglobin values with increasing parity, the mean for primigravida being 11.5 Gm% compared as to 10.7 Gm% for para 5 and above. Corresponding values for PCV are 35.2% and 33.0%, and for MCHC 32.4% and 32.1%. In the survey, 162 mothers (58.3%) were para 1 to 4, and 116 mothers (41.7%) were para 5 and above.

Table III shows that the mean values for hemoglobin, PCV and MCHC are correspondingly lower in the "outside" population, these values being 10.8 Gm%, 33.5% and 32.1% respectively. The respective values for the deep jungle population were 11.8 Gm%, 35.6% and 32.3%.

In the survey, 71 out of 278 pregnant mothers had hemoglobin values less than 10.0 Gm%, the level at which anemia in pregnancy is taken to be present[3]. The prevalence of anemia in pregnancy in Orang Asli women seen at their first antenatal visit is thus 25.5%. Only one of these 71 patients was from the deep jungle population.

Discussion

Kwa and Ko[1] found a gradual and progressive fall in the hemoglobin, PCV and MCHC values as pregnancy advances. The author is unable to establish similar trends in the present study. This could be related perhaps to the relatively small number of pregnant mothers in the study. However, there is a suggestion of a fall in hemoglobin

Table II. Mean Values and Standard Deviations for Hemoglobin, PCV and MCHC in Pregnancy in Orang Asli women with relation to Gravidity.

Gravidity	No. of patients	Mean HB Gm%	S.D.	Mean PCV%	S.D.	Mean MCHC%	S.D.
1	55	11.5	1.66	35.2	4.78	32.4	1.57
2	45	10.9	1.71	33.7	4.53	32.2	1.00
3	34	10.8	2.48	33.5	6.76	31.5	2.07
4	28	10.9	1.59	32.9	3.81	32.4	1.60
5 and above	116	10.7	1.86	33.0	4.78	32.1	1.65

Table III. Mean Values and Standard Deviations for Hemoglobin, PCV and MCHC in Pregnancy in Orang Asli women with relation to location of settlements.

Location of settlements	No. of patients	Mean Gm%	S.D.	Mean PCV%	S.D.	Mean MCHC%	S.D.
Deep Jungle	37	11.8	1.50	35.6	4.37	32.3	1.82
'Outside' Jungle	241	10.8	1.85	33.5	5.10	32.1	1.92

values from the 20th to 36th week of gestation.

Mean values of hemoglobin, PCV and MCHC in the overall figures are considerably low, being 10.9 Gm%. 32.8% and 32.1% respectively. This would respectively suggest a mild degree of iron-deficiency anemia in the average pregnant Orang Asli woman. In this context then, the practice of giving supplementary oral iron to pregnant mothers is well justified.

Increasing parity is known to be related to anemia in pregnancy. The Orang Asli woman is no exception. This relationship is suggested in Table II. In the Orang Asli women, babies are born close to one another within the same family, leaving little time for any pre-anemic or anemic state to correct itself before the next pregnancy. The body stores of iron are therefore depleted without any adequate replacement.

Differences in hematological values between deep jungle and "outside" jungle populations could be related to problems of migration out of the jungle to the fringes and to settlements near villages or towns. Migration creates a change of living habits and change in purchasing values. The usual hunting and fishing for food or cultivation of the land for food gives way to having to work for a living, to earn money to buy food. Being in the lower socio-economic group, the Orang Aslis can afford to spend very little money on food and this leads to insufficient nutrition, especially of proteins and minerals. There is thus a tendency towards under-nutrition and anemia, especially so in the pregnant mother. Migration therefore creates its own problems[2].

It is convenient to attribute such problems to migration but further investigations will have to be done to establish such a relationship. If this relationship was true, then something can be said for leaving the Orang Aslis in the deep jungle rather than to re-settle them outside the jungle, as is being done to exploit available natural resources.

Summary

From the present study of 278 pregnant Orang Asli women seen at their first antenatal visit, the following points can be raised:

(i) The general trend of falling hemoglobin. PCV and MCHC values with advancing pregnancy is not clearly established in the Orang Asli.

(ii) The mean values for hemoglobin, PCV and MCHC are 10.9 Gm%, 33.8% and 32.1% respectively.

(iii) Increasing parity is no doubt a factor in development of iron-deficiency anemia in pregnancy,

(iv) The differences in hematological values in pregnancy between deep jungle and "outside" jungle populations could be related to problems of migration.

(v) The prevalence of anemia in pregnancy in Orang Asli women is 25.5%.

Acknowledgements

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Some aspects of Vitamin A consumption in a rural area in West Malaysia

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Introduction

OBSERVATIONS ON VITAMIN A starvation (sic) among immigrant Indians in Malaya were made by Field (1931). More recently, Vitamin A deficiency was found to be a major cause of blindness in children by McPherson (1955). Biochemical studies, involving the determination of serum carotene and Vitamin A levels in children and adults, were conducted by a team from the Inter-departmental Committee on Nutrition for National Defence (ICNND) in 1962. "Low" or "deficient" levels of serum Vitamin A and carotene were found in about 30 per cent of children under five years of age. Vitamin A deficiency in children was found in further studies conducted by Thomson and others in 1964.

The vitamin A and carotene contents of some Malayan foods were investigated by Leong, 1939; Chandrasekharan, 1969; and Chong and Soh, 1969.

However, investigations into Vitamin A consumption have, in the past, been conducted as parts of wider dietary studies together with the consideration of other nutrients (Thomson, 1960; ICNND, 1962; Jackson, 1970).

The purpose of this study was:

(i) To examine the Vitamin A consumption in a rural area in West Malaysia
(ii) To study the effect of a festival day on
  (a) Overall Vitamin A consumption
  (b) Consumption of the retinol/non-retinol portions of Vitamin A.

Method

Four Malay villages, with a total of 205 households, were selected in the District of Rembau, Negri Sembilan. The population of these villages is engaged in padi-planting and most of the households also own rubber smallholdings. All these households were visited and a 24-hour recall of food consumed by each household was obtained. This was done by third year medical students as part of a rural health survey. The households were visited only once and different households were surveyed on different days. Since these households were fairly homogeneous with regard to their socio-economic status, ethnic group (all Malays), occupations and religion (all Muslim), and since the diet in this rural area had been found in previous studies to be fairly monotonous (Teoh and Cheng, 1967), this method of study, although having certain disadvantages (of possible memory lapses and difficulty in food quantity estimation), was deemed to be the best available under the existing circumstances of limited time and availability of manpower.

The survey of these four villages took six days. The first day of the survey was on a day after a festival day (Hari Raya Haji), thus the information obtained for the 24-hour recall was for the festival day itself. This was designated as Day F and subsequent days were labelled as Day F+1, Day F+2, and so on. The survey was carried out in the months of February-March 1969 which were not during the local fruit season and just before the local rice harvest.

The data obtained in the field were processed and the nutrient intake for each household was calculated by means of a computer programme (Teoh, Lau and Cheng, 1968) using stored data from food composition tables compiled for use in West Malaysia (Department of Social and Preventive Medicine, University of Malaya, 1968).

The following indices were subsequently obtained:

a. **The total intake of Vitamin A for each household in terms of "Vitamin A value":** this is the sum of both the retinol and non-retinol portions of the intake in terms of "retinol equivalence" (WHO, 1967; PAHO, 1970). "Retinol equivalence is calculated as the sum of mcg retinol, mcg Beta-carotene multiplied by one-sixth and mcg other carotenoids multiplied by one-twelvth.

b. **"Percentage requirements met" for each household in respect of Vitamin A:** this was calculated on the following basis:

$$\frac{\text{Total Vitamin A intake calculated from the 24-hour recall of food consumed by a household}}{\text{Total suggested daily intake of Vitamin A for the same household.}} \times 100$$

The suggested daily intakes of Vitamin A were those recommended by the World Health Organisation (1967) and these were applied to all members of each household who participated in the meals under consideration, taking into account their ages and sexes. Summary indices (means, medians and standard deviations) were then

Table 1 — Vitamin A consumption — "percentage requirements met" by specified indices and day of survey.

Indices	Day of Survey						Total
	F	F+1	F+2	F+3	F+4	F+5	6 days
Median % RM*	39.19	33.95	83.19	59.42	34.50	46.94	46.68
Mean % RM	43.01	61.30	99.02	74.54	60.72	56.51	64.23
S.D. + % RM	38.33	63.28	91.61	78.29	75.29	54.92	70.30
Lowest value % RM	2.90	0.82	6.73	0.35	0.00	0.00	0.00
Highest value % RM	123.69	227.56	321.52	364.83	362.32	201.54	364.83
No. of Households surveyed	32	29	15	56	54	19	205

* % RM = "Percentage requirements met"
\+ S.D. = Standard Deviation

Table 2 — Vitamin A consumption — number of households by level of "percentage requirements met" and day of survey.

Percentage Requirements Met	Day of Survey						Total 6 days
	F	F+1	F+2	F+3	F+4	F+5	
0 — 79% ("low")	26	21	7	36	39	15	144
80% and above ("satisfactory")	6	8	8	20	15	4	61
Number of Households	32	29	15	56	54	19	205

($X^2 = 7.65$, df = 5, $0.156 < P < 0.221$)

calculated for the group of households surveyed each day.

c. **The retinol component of the total Vitamin A intake for each household.** These were obtained from the total Vitamin A intake as part of the calculations.

d. **The percentage contribution to the total Vitamin A intake in each household from various food groups.** The food stuffs consumed by the households surveyed were classified into 11 food groups and the contribution of each food group to the total intake of Vitamin A value was calculated. For each of the days of the survey, the mean values for each group of households were obtained.

Results

"Percentage Requirements Met"

On a household basis, the above index was calculated and the mean and median values for each lot of households studied for a particular day of the survey was obtained (see Table 1).

For all the households for the six days of the survey, the median value for "percentage requirements met" (% RM) was 46.68%, indicating a low level of consumption generally. The index of % RM by the various households was classified arbitrarily into categories, viz: "low", 0-79% RM, "satisfactory", 80% RM and above (see Table 2).

For almost every one of the days the survey, the majority of households (average of 70.2%) were in the "low" category. No significant difference was detected in the pattern of distribution of households with regard to their consumption levels from one day of the survey to the next.

Percentage of Retinol and Non-retinol Intake

On the average, for the 205 households studied, the Vitamin A intake was composed of 14.12% retinol and 85.88% non-retinol (Table 3). The highest retinol intake was during the festival day (Day F) and the day after (Day F+1).

When the households were grouped according to the proportion of retinol in their diets, those with a proportion of 0-19% retinol were considered as "low" and those with 20% retinol or over in their intakes were considered as "not low". The distribution pattern of households for each of the days of survey is presented in Table 4. There was a significant difference in the pattern of distribution of the households from one day of the survey to

Table 3 — Vitamin A consumption — percentage of total intake as retinol and non-retinol by day of survey.

Percentage of Vitamin A Intake	Day of Survey						Total 6 days
	F	F+1	F+2	F+3	F+4	F+5	
Retinol	33.09	22.39	13.62	10.42	5.56	10.57	14.12
Non-retinol	66.91	77.61	86.38	89.58	94.44	89.43	85.88
Number of Households	32	29	15	56	54	19	205

Table 4 — Vitamin A consumption — number of households by percentage of retinol intake and day of survey.

Retinol % of Total Intake	Day of Survey						Total
	F	F+1	F+2	F+3	F+4	F+5	6 days
0 — 19% ("low")	14	14	13	29	37	14	121
20% and above ("not low")	18	15	2	27	17	5	84
Number of Households	32	29	15	56	54	19	205

($X^2 = 14.13$, df = 5, $0.010 < P < 0.016$)

the next. The proportion of households in the "not low" group for Days F and F+1 was higher than for the other days.

Percentage contribution by various food groups

A number of food groups contribute to the total intake of Vitamin A, mainly vegetables and fruits, meats and condiments. The mean percentages contributed by the various food groups for various days of the survey are presented in Table 5.

For Days F and F+1, the contributions by the food group "meat and egg" reached 25 per cent. On the average for all six days, animal sources contributed only 24.7 per cent of the Vitamin A intake. The rest were from vegetable sources which could only contribute the less efficient precursors of Vitamin A, viz. Beta-carotene and other carotenoids.

Discussion

The sources of Vitamin A may be from foods of animal or vegetable origins. Retinol, which is Vitamin A alcohol, is derived from foods of animal origin whilst the non-retinol component represents the Vitamin A that may be obtained by the body from precursors in the form of Beta-carotene and other carotenoids mainly by the consumption of vegetables and fruits. Retinol is a more efficient source of Vitamin A than Beta-carotene or the other carotenoids as these have to be converted into Vitamin A before utilisation and losses are thereby sustained.

Although there did not seem to be an increase in the consumption of Vitamin A on the festival day, there was a significant change in the retinol component of the intake. This perhaps may be explained by the observation that on Days F and F+1, all the households visited served buffalo meat for their meals. Since this meat was relatively expensive, only small amounts were purchased. Further, since expenses were already incurred in the purchase of meat, less vegetables were included in the meals of these two days. Hence, although the retinol component of the intake was raised by this practice, the overall intake remained the same. From Day F+2 onwards, meat supplies were exhausted and vegetables were again purchased. This was relatively cheaper and larger amounts could be obtained. But although this could be done, the overall intake remained more or less the same as these vegetables supplied Vitamin A in the form of Beta-carotene and other carotenoids which are only one-sixth and one-twelfth as effective as retinol respectively.

The above results seem to indicate that both the quantity and quality of Vitamin A intake in this particular rural area of West Malaysia is low. Therefore, it is felt that should any programme for the improvement of Vitamin A consumption be carried out, not only should the level of consumption be raised, but the retinol/non-retinol ratio of the intake should also be changed.

Summary

The Vitamin A consumption of 205 households in a rural area in West Malaysia was studied. In general, it was found that the Vitamin A intake was low, the median value of "percentage requirements met" by households being 46.68%. Seventy per cent of the households had intakes lower than the suggested daily dietary intakes. The effect of a festival day was to increase the retinol component but not the total amount of Vitamin A consumed.

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Table 5 — Vitamin A consumption — mean percentage contribution to total Vitamin A intake by food group for each day of the survey.

Food Group	Day of Survey						Total
	F	F+1	F+2	F+3	F+4@	F+5@	6 days
1. Cereals	—*	—	—	—	—	—	—
2. Starchy roots	—	—	—	1.8	—	—	0.5
3. Sugars	—	—	—	—	—	—	—
4. Legumes	2.8	6.4	10.2	10.7	9.1	25.2	9.7
5. Vegetables/fruits	29.1	10.4	58.6	53.8	51.8	51.1	47.6
6. Meats/eggs	25.2	25.5	4.7	18.2	15.4	11.8	18.0
7. Fish	—	—	—	0.3	2.2	—	0.7
8. Milk	7.2	11.8	3.7	3.9	5.5	4.0	6.0
9. Oils/fats	2.8	1.7	11.2	0.8	0.1	—	1.7
10. Condiments	32.5	14.1	11.6	10.1	12.3	2.6	14.2
11. Miscellaneous	0.3	—	—	0.3	—	—	0.1
Number of Households	32	29	15	56	54	19	205

* — indicates negligible or zero

@ — Days F+4 and F+5 contained households that did not consume foods containing Vitamin A.

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Pattern of injuries and illnesses in the Malaysian Olympic team

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Introduction

THE PURPOSE OF this paper is to outline the range of injuries and illnesses suffered by the members of the Malaysian Olympic Team during their stay in Munich for the 1972 Olympics from the 17th of August to the 10th September.

The contingent consisted of the following competitors:

Athletics	—	7 males & 2 females
Badminton	—	3 males
Cycling	—	4 males
Football	—	19 males
Hockey	—	19 males
Shooting	—	1 male
Swimming	—	1 male & 1 female

making a total of 57, including three females.

Prior to their departure for Munich, the members of the Olympic contingent were subjected to an extensive medical examination, including E.C.G. before and after exercise, chest X-rays and pathological tests by the sub-committee on Medical Aspects of the Sports Medicine Consultative Committee to the National Sports Council.

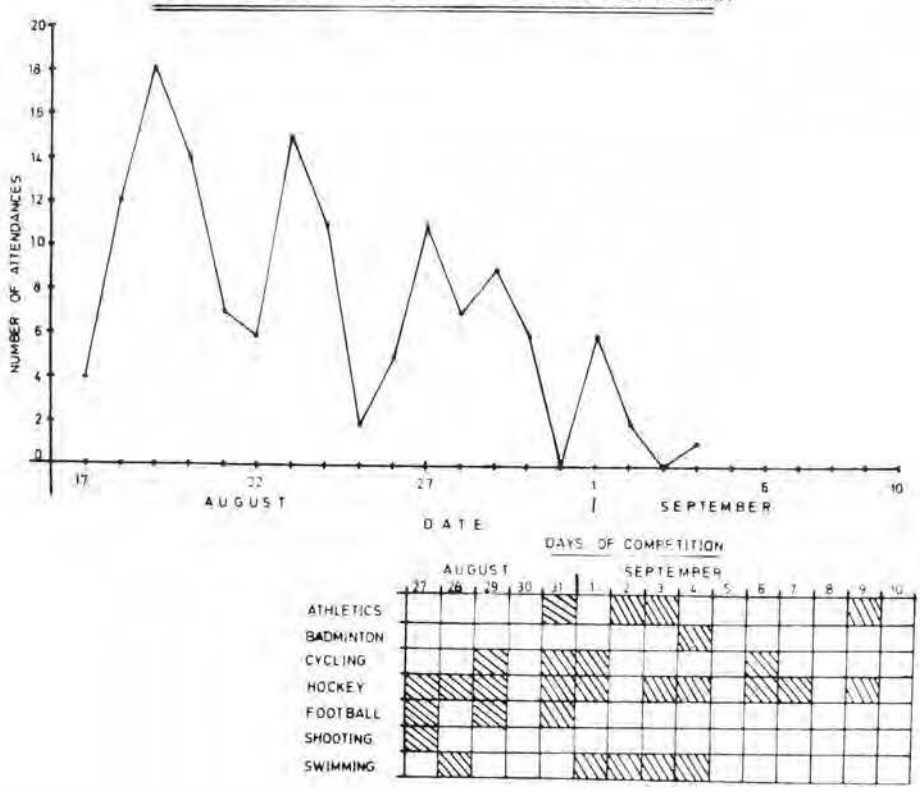
Findings

Illnesses and injuries recorded in this paper were those that occurred throughout the duration of the team's stay in Munich and were attended to by the author in the contingent's clinic.

Figure I shows the trend of the daily attendances at the team's clinic and includes not only the medical problems of the athletes but also of the officials, pressmen and supporters who sought medical attention. Further discussion in this paper will be restricted to athletes only as it is assumed that the pattern of complaints among officials and supporters would in no way differ from those encountered in ordinary general practice.

The medical problems that the athletes faced while in Munich can be divided into two categories:

FIGURE 1 - FREQUENCY OF ATTENDANCE AT THE MALAYSIAN TEAM'S CLINIC



(a) Those that were directly related to their participation in their particular sport, which will from now on be referred to as athletic injuries.
(b) Incidental illnesses — medical conditions which were not directly brought on throught participation in sporting activies.

Table I shows the breakdown of these episodes in relation to the different disciplines of sport.

Tables II (a) and (b) list out the medical conditions encountered and their relative frequency of occurrence among the different groups. Table II (a) refers to athletic injuries while Table II (b) refers to incidental illnesses.

The classification of athletic injuries follows as far as possible the recommendations laid down by the American Medical Association in its handbook "Standard nomenclature of athletic injuries" (1968).

There were 38 separate episodes of injuries due to athletic activity and 19 of incidental illness. In a number of cases, one particular athlete suffered from more than one separate complaint in either or both categories.

Of the total contingent of 57, 32 sought medical attention at some time or other, giving a percentage of 56.1; 25 athletes sought attention for athletic injuries while 16 (including nine from the previous category) suffered some form of incidental medical illness.

Illness or injury in nine athletes was severe enough to affect their performance adversely.

Discussion

Looking at Figure I showing total number of attendances per day at the author's clinic, it can be noticed that there was an initial peak on the 2nd-4th days. This could be due to a number of factors, namely:—

(a) The change of climate and environment.
(b) The fact that the hockey and athletic teams had arrived earlier in Europe and had

Table I

Frequency of episodes of illnesses/injuries in the different categories of sportsmen.

Type of Sport	Total No. of Competitors	Injuries / Illnesses				Total No. of athletes affected	Percentage affected
		Activity related		Incidental			
		No. of athletes affected	Total No. of episodes	No. of athletes affected	Total No. of episodes		
Athletics	9	4	5	3	5	6	66.6%
Badminton	3	1	1	—	—	—	33.3%
Cycling	4	—	—	—	—	1	0%
Football	19	9	15	7	8	12	63.1%
Hockey	19	10	15	5	5	11	57.8%
Shooting	1	—	—	—	—	—	0%
Swimming	2	1	2	1	1	2	100%
Total	57	25	38	16	19	32	56.1%

Table II (a) — Athletic injuries.

Type of Injury	Frequency according to type of sport						
	Athletics	Badminton	Cycling	Football	Hockey	Shooting	Swimming
1. Contusion (14)	—	—	—	7	7	—	—
2. Laceration (3)	—	—	—	—	3	—	—
3. Muscle Strains (pulls)							
(a) hamstring (5)	1	1	—	2	—	—	1
(b) gastrocnemius (1)	—	—	—	—	1	—	—
(c) adductors of thigh (3)	1	—	—	2	—	—	—
(d) gluteus maximus (1)	1	—	—	—	—	—	—
4. Ligament Injuries							
(a) sprained ankle (3)	1	—	—	1	1	—	—
(b) sprained medial ligamnet of knee (2)	1	—	—	1	—	—	—
5. **Miscellaneous**							
(a) forefoot metatarsalgia (1)	—	—	—	—	1	—	—
(b) peroneal tenosynovitis (2)	—	—	—	—	2	—	—
(c) brusied heel (1)	—	—	—	1	—	—	—
(d) plantar fascitis (1)	—	—	—	—	—	—	1
(e) recurrent patella dislocation (1)	—	—	—	1	—	—	—

Table II (b) — Incidental illnesses.

Type of Illness	Frequency of occurrence according to type of sport						
	Athletics	Badminton	Cycling	Football	Hockey	Shooting	Swimming
1. Gastroenteritis (2)	2	—	—	—	—	—	—
2. Conjunctivitis (1)	—	—	—	1	—	—	—
3. Upper Respiratory Tract Infection/Pharyngitis (12)	3	—	—	5	3	—	1
4. Abscess (1)	—	—	—	1	—	—	—
5. Gastritis (1)	—	—	—	—	1	—	—
6. Dermatomycosis (2)	—	—	—	1	1	—	—

sustained injuries but had deferred treatment until the main contingent had arrived.

One would also notice another peak just prior to the competitions began. This, perhaps, is due to the fact that the athletes have been experiencing pre-competitive tension. Another factor is a number of "friendly" competitions played by the hockey team. In the "friendly" games, the umpires tended to be less strict and hence the chances of injury were higher.

One may be surprised to note that as the competitions commenced, the number of attendances at the clinic decreased. During this period, the athletes were so preoccupied not only with their own participation but also in watching other competitions and tended not to seek medical attention for minor problems. Even injured athletes, who were supposed to have physiotherapy daily, tended to stop coming for treatment once their own particular event was over.

The different conditions that were encountered will now be discussed in greater detail.

A. **Sports Injuries**

Williams (1971) divides all sports injuries into two basic categories:

(a) Consequential.
(b) Non-consequential.

Consequential injuries are those that arise from the participation in sports or of training for sport.

Non-consequential injuries are those due to other non-sporting causes but which interfere with the practice of sport.

Consequential injuries may be further classified as primary or secondary. Primary injuries are those directly due to sports activity. Secondary injuries arise because of immediate or past presence of some other untreated, partially treated or mistreated injury.

The causes of primary injuries may be **extrinsic** — due to human, implemental, vehicular or anvironmental causative agents; or **intrinsic** — due to some failure in the coordination of the individual.

Secondary injuries are necessarily due only to **intrinsic** factors.

In the Malaysian Olympic Team, the commonest injuries encountered were contusions, lacerations and muscle strains.

Contusions and lacerations are due to direct trauma caused by either human or implemental agents. It is not surprising, therefore, that all such cases seen in this series were from members of the hockey and football teams. Lacerations were only seen in hockey players. This is also expected as in hockey there are two potential sources of injury — the stick and the ball, in addition to the risks of bodily contact as is encountered also in football.

It is interesting to note that the cyclists suffered no injuries. This is because in cyling the incidence of injuries is unpredictable and depends on whether there has been a collision or mishap and it was just fortunate that members of our cycling team were not involved in any such accident. Cycling events are run on both the road and in the velodrome. In Munich, the velodrome was exceptionally steeply banked and our lone cyclist kept out of the way of the others by not making much use of the banking which was unfamiliar to him.

Minor contusions, abrasions and lacerations are considered by many of our footballers and hockey players as being part and parcel of their activity

and they usually do not seek medical attention for these complaints unless these are severe enough. This emphasises the need for routine anti-tetanus prophylaxis in all outdoor sportsmen.

Muscle strains, otherwise known by athletes as "pulls", can vary in severity depending on the circumstances during which such injury is sustained. Muscle strains are due to the tearing of muscle fibres or connective tissue of muscle and since muscle is so vascular, the immediate effects are internal haemorrhage, swelling, pain and loss of function of the affected part. Treatment is aimed at minimising the initial bleeding and once the stage of active bleeding is over, to apply physiotherapy so as to hasten healing and prevent adhesions. Muscle strains usually occur in athletes who have to perform "explosive" movements, such as sprinting and jumping. Of the ten cases of muscle strain encountered, only one occurred during actual competition and was severe enough to necessitate withdrawal from further competition. The other cases were less severe and remedial procedures were satisfactory enough to enable the athletes to continue participation.

B. **Incidental illnesses**

Most of the cases in this category belonged to the expected episodes of upper respiratory tract infections and gastroenteritis.

In a team which is housed together, infectious diseases of the upper respiratory tract are bound to spread rapidly throughout the team, particularly among roommates and the incidence of upper respiratory tract infections were minimised by placing the patients in an isolation room during their period of infectivity. Why some persons are more susceptible to such infections than others is a matter for debate but it has been pointed out by other authors that physical fitness does not necessarily go together with increased resistance to infection.

Only two cases of gastroenteritis occurred. This was probably due to the fact that except in a few instances, members of the team were in the Olympic Village where preparation and serving of food was under strict supervision. Another possibility was that many cases with mild symptoms did not report for treatment. This was in sharp contrast to the Mexico Olympics where the fear of gastroenteritis was second only to that of the high altitude.

Dermatomycosis is another complaint for which the athletes seldom sought medical attention unless pruritus and scaling were severe and the lesions were unsightly. This explains the low incidence of such complaints in this series.

Conclusion

There is a wide range of injuries and medical problems that athletes in international games can experience and this was evidenced by the fact that 56.1% of our team had to seek medical attention.

Each particular sport had its own pattern of injuries and the football and hockey players were more susceptible to injuries of the primary **extrinsic** type, while athletes who performed in individual events suffered more from injuries of the **intrinsic** type.

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Occupational distribution of Leptospiral (SEL) antibodies in West Malaysia

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Introduction

LEPTOSPIROSIS IS HIGHLY endemic in West Malaysia, especially in the rural areas (Tan, 1970a). About 30 different pathogenic serotypes leptospires have been isolated (Alexander et al., 1957) and clinical cases have been extensively reported in civilian (Turner et al., 1959; Tan, 1970b) as well as in military groups (McCrumb et al., 1957; Alexander, 1957).

A serological survey to determine the status of leptospirosis in various occupational groups was conducted throughout West Malaysia from 1961 through 1971, the results of which are presented in this article.

Materials and Methods

A total of 4,646 sera was obtained from afebrile persons of 18 occupational groups in various states of West Malaysia. Some of these were collected and sent to the laboratory by the staff of health centres, clinics, hospitals, veterinary departments and military camps, and the others were taken personally by the author and her assistant who visited the various states for this purpose.

The technique employed for the serological survey was the Sentisized-Erythrocyte-Lysis (SEL) test described by Chang et al. (1957). The antigen or Erythrocyte Sensitising Substance (ESS) was prepared from the AM strain of Leptospira biflexa. The SEL test has been evaluated as an epidemiological tool for human leptospirosis serological surveys (Tan, 1969), and the significant titre was found to be 1:80.

Results and Discussion

Table 1 shows the distribution of SEL antibodies among 18 occupational groups in West Malaysia, the total incidence of which was 12.7% or 592/4,646.

Table 1

SEL Antibody Distribution among 18 occupational groups in West Malaysia (in order of frequency)

Group	No. examined	No. pos.	% pos.
Oil palm estate workers	92	30	32.6
Hospital staff	47	12	25.5
Rubber estate workers	427	99	23.2
Town cleansing labourers	459	82	17.9
Malaysian armed forces	290	50	17.2
School children	176	30	17.0
Tin miners[1]	122	20	16.4
Farmers	204	30	14.7
Anti-malarial labourers	246	32	13.0
Padi planters	259	37	14.2
Shop-owners	172	21	12.2
Policemen	154	18	11.7
Veterinary staff	463	54	11.6
School teachers	53	5	9.4
Housewives	1201	64	5.3
Office workers	120	6	5.0
Tin miners[2]	136	2	1.5
Fishermen	25	0	0
Total	4,646	592	12.7

1. Of open cast, dredge and gravel pump mines
2. Of a lode or underground mine.

The highest rate of infection was found among workers in **oil palm estates.** Here, the main rat species is the **R. jalorensis** rat which, although normally arboreal in habitat, is strongly attracted in great numbers to ground level when the fruit is cut down and stored. Although the incidence of leptospirosis in this rat species was found to be only 3% (Smith et al., 1961) their sheer abundance in numbers in these estates more than facilitates transmission of leptospirosis to the workers the majority of whom live, as well as, work there.

The antibody prevalence ratio in **rubber estate workers** was also high (23.2% or 99/427), but it was found to vary considerably among different estates depending on their acreage and hence, their relative proximity to secondary forest with highly infected ground rats (Tan, 1970a). Of five rubber estates studied, very high antibody ratios were found in three of them and very low, in the remaining two (Table 2). Here, the main rat species is also **R. jalorensis** but unlike the conditions in the oil palm estates, these tree rats are are not attracted to ground level by the products of the rubber tree in the same way as they are by the oil palm fruit and are therefore not expected to be an important source of leptospirosis to the rubber estate workers. The extremely high infection rates found in the

Table 2

Leptospiral SEL Antibody studies in five rubber states in West Malaysia

Locality	State	No. Examined	Posi-tive	Per Cent
GUA MUSANG	KELANTAN	37	17	45.9
PUCHONG	SELANGOR	50	22	44.0
TANGKAK	JOHORE	54	23	42.6
SUNGEI CHOH	SELANGOR	60	2	3.3
BATU TIGA	SELANGOR	80	0	0
TOTAL		281	64	22.8

above-mentioned three estates must therefore be attributed to factors other than those directly related to the rubber industry.

Many rubber estates, especially the small ones, are closely adjacent to forest areas and are likely to be invaded by the highly infected rats from them. Most of the workers, in the course of their daily duties, trudge through the estate bare-footed. After a period of rainfall, the water on the ground, if previously contaminated with infected rat urine, may well serve as an effective vehicle for the transmission of leptospirosis through the worker's feet, the skin of which is often far from intact. This situation is, in fact, true of the three estates which showed high antibody prevalence ratios. Secondary forests are, indeed, situated near or around these estates, whereas the last two estates, with extremely low antibody ratios, stretch for miles across the country with hardly a secondary forest in sight. Another possible means of infection is through infected house rats and scrub or grassland rats, which commonly enter homes from their normal habitat. The quarters of the estate workers, situated in the estates, themselves, are therefore easily accessible to them.

Hospital staff members appeared also to be highly infected (25.5% or 12/47). Whether the infection was acquired from the hospital environment or from their own homes is not known, but the easily available facilities for medical and laboratory investigation could have increased the chances of detection of the disease in this group.

Town cleansing labourers deal with refuse collection and sweeping of roads and drains. As expected, they were quite highly infected (17.9% or 82/459). The **anti-malarial labourers** have a slightly lower prevalence ratio of 13.0% or 32/246.

Two groups of **Malaysian soldiers** were studied in 1970 (Tan & Lopes, 1972). They comprised (i)

those in service for six months to 20 years and (ii) those newly recruited for only two to three weeks. Of the first group, 12.1% or 17/140 showed significant titres of SEL antibodies, whereas 22.0% or 33/150 were positive in the second group. The overall rate was 17.2% or 50/290. These results were contrary to expectation but may be explained by the fact that most of the new recruits were from rural areas where leptospirosis abound and therefore showed a higher antibody ratio. The experienced soldier, on the other hand, is exposed to leptospirosis only when he is posted to an infected area and even then, because he is taught the basic elements of personal hygiene and is required to observe certain precautionary measures, is less likely than the village youth to become infected with the disease.

The incidence of clinical leptospirosis in Malaysian soldiers (4.6% or 2/43) was very much lower than that of the British soldiers (30% or 28/93) examined in 1960-61. Only 4.9% or 10/204 of the British soldiers had significant levels of SEL antibody.

Schoolchildren, especially those living in rural areas, are relatively highly infected (17.0% or 30/176). **School teachers,** on the other hand, have a low rate of infection (9.4% or 5.53). This is easily appreciated as it reflects the care-free way of life led by the former group compared with the latter, since village children think nothing of drinking from or bathing in nearby streams and rivers, and usually run around bare-footed.

The **tin miners** examined belonged to two categories: (i) those engaged in open cast, dredge and gravel pump mines which employ water in the mining process; and (ii) those who work in lode or underground mines which extend to depths varying from 200 to 1,600 feet and which are relatively dry. The much higher rate of infection in the first category (16.4%) as compared with the second (1.5%) may be attributed to the wetter conditions of work in the first group. The resident medical officer of the lode mine studied, Dr. B. Freman, suggested that the very low prevalence of leptospirosis in his mine might be due to the usage of herbicides along streams and drainage channels in routine anti-malarial work (personal communication).

Farmers and padi planters were both only moderately infected. The padi planters in the state of Kelantan were studied in connection with the pH values and chemical composition of the soil in the ricefields (Tan, 1970c). Clinical leptospirosis was not as frequent as expected in this group of workers although the infection rate was about 12% in this state. The pH values of soil and water samples were very low (mean pH: 4.8 to 5.9) and the soil type was mainly clay, which has been found in the laboratory to adsorb leptospires (Smith & Turner, 1961). Although the rodent host species most frequently found in the Malaysian ricefields, viz. **R. argentiventer,** had a high leptospiral excretion rate, when the inlet and outlet water of a ricefield was checked for leptospires during a 5½-month period of observation, the outlet water yielded only half the number of isolates as the inlet water (Baker, unpublished findings). This may be due to the water and soil conditions which were unfavourable for the survival and multiplication of the leptospires excreted into the ricefield. The low frequency of clinical leptospirosis in ricefield workers may therefore be attributed to acquired immunity through continued infection by leptospires which have not only been reduced in dosage but also in virulence.

Shops in West Malaysia, especially those dealing in sundry goods and groceries, are often infested with rats. The incidence of leptospirosis in house rats have been found to be 34% for **R. norvegicus** and 3% for **R. diardi,** (Smith et al., 1961). As these shops usually also serve as places of residence for the owners, it is not surprising the **shopowners** show a relatively high leptospiral infection rate (12.2%).

The **police force** of various states was also studied for SEL antibody prevalence. Of 154 examined, 18 or 11.7% were positive. As most of the policemen were from rural areas, it is not certain whether the infection was acquired from their kampongs (or villages) or through trudging across country terrain during the course of their duties.

Representative samples of blood, ranging in number from 26 to 81, were obtained from members of the **veterinary staff** from ten states in West Malaysia. The overall incidence was 11.6% or 54/463. However, the rates varied considerably from state to state, the infection being highest (44.4%) in Selangor and the lowest, (2.3%) in Johore. The possible reasons for these variations are being studied, mainly in connection with the incidence of leptospirosis in the animals handled by this group of workers.

Housewives and office workers, who are mainly from urban areas, showed low prevalence ratios, as expected.

No evidence of infection was found among **fishermen.** However, the number studied was too small for a valid conclusion.

Clinical Leptospirosis by Occupation

In West Malaysia, the number of clinical leptospiral cases severe enough to be hospitalised (and eventually laboratory-confirmed as leptospirosis) has been small compared to the number of infected persons detected by antibody surveys. In the ten-year clinical appraisal of leptospirosis in West Malaysia (Tan, 1970b), out of 1,993 suspected cases examined, only 559 cases (28%) were confirmed positive. This works out to an average of about 56 cases annually or 0.59 cases per 100,000 population per year, based on the estimated population of West Malaysia as at 31st December, 1970, which was 9.36 million.

The relatively low clinical rate may be attributed to infection by serotypes, the majority of which give rise to subclinical or mild forms of leptospirosis. In addition, SEL antibodies are acquired as early as four to six years of age, especially by children in rural areas. These antibodies persist throughout the older age groups at much the same levels (Table 3). As SEL antibodies last for about two years only (Tan, 1969), this indicates constant re-infection throughout life, even up to 60 years and above, the repeated booster effect conferring a high state of immunity to the general population.

Table 3
Leptospiral SEL Antibody ratios in different age groups

Age groups	No. examined	Positive	Per cent
0 - 10	193	19	9.8
11 - 20	781	99	12.7
21 - 30	1,571	191	12.2
31 - 40	1,080	111	10.3
41 - 50	673	90	13.4
51 - 60	331	42	12.7
60 or more	190	16	8.4
Total	4,819	568	11.8

Analysis of the 559 cases of clinically confirmed leptospirosis showed that only in 307 cases (54.9%) were the occupation of the patient recorded in his data form, although it had been repeatedly stressed that this particular information was important (Table 4). This was most unfortunate, as much of the reliability of the occupational distribution figures was lost. However, bearing this in mind, on examination of the available data, it was found that the "general labourers" who deal with cleansing, anti-malarial work and forestry were most susceptible to the severe effects of the disease. Next in order of frequency were the rubber estate workers, schoolchildren and soldiers, who were mainly of Caucasian origin. Very few Malaysian soldiers were affected. Contrary to expectation, the padi planter, the vegetable farmer and the veterinary worker were not among the highly affected groups. Possible reasons for the relative low clinical rate in padi planters have been discussed in the foregoing. Oil palm estate workers were not represented here in spite of their high exposure to the disease. However, some of them could have been included under the "unknown" category.

Table 4
Distribution of 559 cases of Leptospirosis according to occupation (1958-1968)

Occupation	No. of cases	Per cent of total positive
General labourers	94	16.8
Rubber estate workers	53	9.5
School children	37	6.6
Army personnel (mainly Caucasian)	28	5.0
Housewives	23	4.1
Police	16	2.9
Shop owners	12	2.2
Padi Planters	8	1.4
Tin miners (miscellaneous)	7	1.2
Office workers	7	1.2
Farmers	7	1.2
Field research workers	6	1.1
Medical staff	6	1.1
Veterinary workers	1	0.2
Miscellaneous	2	0.4
Total	307	54.9
Unknown/unemployed	252	45.1
Grand total	559	100.0

Summary

A survey for leptospiral (SEL) antibodies was conducted throughout West Malaysia from 1961 through 1971 on 18 occupational groups. A total of 4,646 sera was tested of which 592 or 12.7% were positive.

High antibody rates (23.2% to 32.6%) were found among oil palm estate and rubber estate workers and hospital staff. Moderately high rates (13.0% to 17.9%) were observed in labourers, the army, tin miners (of open cast, dredge and gravel pump mines), farmers and padi planters. Moderate rates (11.6% to 12.2%) were found among shop-owners, policemen and the veterinary staff and low rates (1.5% to 9.4%), were detected in school

teachers, housewives, office workers and tin miners of underground or lode mines.

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Clinical application of ascending urethrography in males

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ASCENDING URETHROGRAPHY is the retrograde examination of the male urethra. This can be done by three methods, viz:

1. Use of Knutsson clamp,
2. Use of Foley catheter, and
3. Use of a specially designed instrument.

Indications for urethrogram

Ascending urethrogram is done mostly in cases of urethral stricture. It is also done in cases of urethral injuries, urethro-perineal fistulae, urethral calculi and in demonstration of false passages following bougie dilatation of urethral stricture.

Contraindications

The examination is contraindicated in the presence of acute urethritis and balanitis.

Complications

(1) The contrast medium may enter the cavernous tissue (urethrocavernous reflux) or blood vessels (intravasation). Hence, a water-soluble type of contrast medium is used to avoid the danger of pulmonary embolisation.

(2) The danger of irradiation of testes must be evaluated against the advantages of the information obtainable. Lindbolm and Romanns (1962), stated in the average examination the dose to the gonads amounts to 0.5 r per exposure.

Technique

We, in the Department of Radiology, Univer-

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sity Hospital, Kuala Lumpur, use a special instrument for ascending urethrography in males. (Ng, 1972).

Strict asepsis is essential. The patient is asked to empty his bladder before the start of the examination. A plain film of the pelvis is done. This may show the presence of:

a. Prostatic calculi.
b. Calcification in the bladder as seen in TB cystitis and Schistosomiasis.
c. Urethral calculi.
d. Sometimes even radio-opaque foreign bodies.

The patient is examined in the supine position. The instrument is properly applied and strapped onto the penis by a plastic strap. About 20 ccs. of Conray 280 is injected under fluoroscopic control. Spot films are then taken with patient in the AP, right oblique and left oblique positions. Sometimes spot films are taken with the patient in the true lateral position.

Radiological findings

I. Urethral stricture

In all the ten cases examined, the urethral strictures were situated in the posterior urethra. The strictures were long in some cases and short in others. (see Figure I).

Figure I shows a short posterior urethral stricture in a 40-year-old Indian ambulance driver who complained of difficulty in micturition since 1968. He gave a history of exposure to venereal disease. Panendoscopy confirmed the presence of a stricture in the membranous urethra. Urethral dilatation was done, following which the patient voided well.

II. Urethral calculus

Figure II shows a stone situated within the posterior urethra of a 52-year-old Malay man who gave a history of hesistancy, poor-stream, frequency and bouts of dysuria, haematuria and overflow incontinence. No history of exposure to venereal disease was given. Prior to the urethrogram, urethral dilatations were attempted but failed. The posterior urethral calculi were removed subsequently via a cystotomy. Urethral dilatation was done afterwards. Three months later, the patient was voiding well.

III. Urethro-perineal fistula

Figure III shows urethro-perineal fistula resulting from prolonged indwelling urethral catheterisation in a 19-year-old Indian man who developed quadri-plegia following a motor vehicle accident.

IV. Prostatic enlargement and false passage

Figure IV(a) and Figure IV(b) are films taken in ascending urethro-graphic examination of a 60-year-old Chinese man.

Figure IV(a) shows (1) Marked prostatic enlargement as evidenced by indentation at bladder neck and elongation of supra-collicular urethra as the enlargement of the prostate is proximal to the colliculus (Middlemiss 1952) and (2) Trabeculated and thick-walled bladder with bladder diverticula giving a "Mickey Mouse" appearance.

Figure IV(b) shows (1) A short stricture at the membranous urethra, and (2) A false passage with periurethral extravasation due presumably to previous dilatation. The patient gave a history of dysuria and urethral discharge nine years previously following contact with venereal disease. Six years ago, he had two episodes of acute retention of urine. Urethral dilatation was carried out at a district hospital on each occasion with relief of symptoms. He was admitted to the University Hospital with another acute episode of retention of urine. The above ascending urethrogram was done followed by dilatation of the urethra and trans-urethral resection of the prostate. The patient voided well after this.

Discussion

In the cases cited above, lesions in the male urethra were demonstrated by ascending urethrography.

The examination was technically simple to carry out. It was comfortable for the patient and was not attended by any untoward complication. However, the information which it provided was often valuable to the clinician.

In urethral stricture, the presence of long or multiple strictures would prepare the surgeon for a more difficult urethral dilatation. The sites of these strictures could also be clearly shown by the radiological examination, thereby making the urethral dilatation more safe for the patient.

The second case showed how easily a urethral calculus was missed, resulting in an unsuccessful and traumatic attempt at urethral dilatation. An ascending urethrogram performed before urethral dilatation would obviate the risk of urethral damage from "blind" urethral dilatation.

Case number three demonstrated a complication of prolonged urethral catheterisation.

The fourth case showed the value of ascending urethrography in demonstrating both lesions (namely, urethral stricture and prostatic enlargement) each of which could account for the patient's symptoms.

In the absence of an urethrogram, one of these lesions could be missed. Dilatation of the urethral stricture without attending to the enlarged prostate would fail to relieve the patient's symptoms. Similarly, an unsuspected urethral stricture could make prostatectomy more difficult. Tuberculous urethritis is an unusual cause of urethral stricture. The fifth case, we believe, is such a case. The presence of tubercle bacilli in the urine and the typical radiological changes in the chest film and intravenous pyelogram are strong factors in favour of the diagnosis.

An ascending urethrogram may be very helpful in acute injuries of the urethra. The presence and

V. T.B. urethritis

Figure V. shows an irregularly narrowed urethra with urethro-perineal fistula and right vesico-ureteric reflux in a 53-year-old Chinese man. Chest X-ray showed changes consistent with pulmonary tuberculosis. Patient had an intravenous pyelogram which showed evidence of tuberculosis of the urinary tract, namely (a) a small contracted bladder; (b) ill-defined minor calyces of the right and left kidneys; and (c) strictures in the lower ends of both ureters with proximal dilatation. Clinical examination of patient revealed that the prostrate was firm and irregular. The testes and epidydymis were normal. Urine and sputum contained acid fast bacilli.

VI. Urethral injuries

Figure VI shows a total obstruction to the retrograde flow of contrast medium at the membranous urethra in a 38-year-old Indian labourer who was involved in a motor vehicle accident. The patient was unable to micturate. Urethral catheterisation failed and a suprapublic cystostomy was done. The above urethrogram was done one month after admission. About six months following the injury, the stricture of the membranous urethra was successfully dilated. With periodic dilatation, patient is able to micturate quite well.

site of urethral rupture are readily demonstrated. Treatment can then be decided upon.

In the sixth case, the urethrogram was done one month following injury. The delay in direct definitive treatment of the urethral rupture has made the subsequent management difficult. Moreover, the patient now required dilatations to keep his urethra patent. This may have been avoided if diagnosis and treatment was prompt.

Summary

Illustrative cases have been presented to demonstrate the clinical application of ascending urethrography in males.

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Wound infection

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WOUND INFECTION is a perennial problem which confronts surgeons in every part of the world. Recently, in the last ten years or so, a vast amount of literature, mainly from the Western countries, has been produced on this topic. No major study of wound infection had previously been carried out in West Malaysia. It was therefore decided to investigate 1,000 consecutive unselected cases with operative wounds in order to elucidate the factors involved in wound infection in our Malaysian patients. These patients were operated upon over a 10-month period from May 1st, 1971 to February 29th, 1972. They were admitted to the second General Surgical Unit at the General Hospital, Kuala Lumpur, West Malaysia. The study was conducted under the direct supervision of the author.

Materials and Methods

Definition of wound infection

The wound was adjudged to be infected when one or more of the following findings were recorded:

(1) Bacteria can be cultured from the wound in the presence of inflammation.
(2) Pus is present. Bacteria may or may not be culturable from the pus. Sterile pus may be present when antibiotics are used.
(3) The wound edges have broken apart. Here a distinction is made between the actual breaking apart of the wound edges due to infection and failure to bring the wound edges together in contact due to improper suturing.

Statistical methods

To test the equality of two proportions, P_1 and P_2, we set the null hypothesis H_0: $P_A = P_B$

against the alternative hypothesis H_1: $P_A > P_B$

The statistical test used is the standard Z — test with

$$Z = \frac{P_A - P_B}{\sqrt{Pq\left(\frac{1}{N_A} + \frac{1}{N_B}\right)}}$$

where $P = 1 - q = \frac{f_A + f_B}{N_A + N_B}$

— f_A being frequency of wound infection in sample A.

— f_B being frequency of wound infection in sample B.

— $N_A + N_B$ being total number of observations in samples A and B.

For a large number of observations, Z is the standardised normal variate and the compute values are compared with theoretical values, Z alpha, of Z at 100 alpha % levels of significance, that is, we are prepared to take a risk of 100 alpha or P(Z > Z alpha) alpha.

For example, at 5% significant level, alpha = 0.05 and from the table of normal distribution, Z alpha = 1.6449. If the compute value of Z is less than Z alpha, there is no evidence to reject H_0 at 100 alpha % significant level. If the computed value of Z is greater than Z alpha, we say that there is evidence at 100 alpha% significant level that there is a significant difference between P_A and P_B, that is, reject H_0 in favour of H_1 at 100 alpha % significant level. $P_A > P_B$ or in other words, we

The operator

The second General Surgical Unit at the General Hospital, Kuala Lumpur, West Malaysia, consists of two specialist surgeons, one or more medical officers who are under training for a higher surgical qualification and three or more house doctors doing their pre-registration year. All these categories of medical staff operate on the patients within the limits of their capabilities. From Table 1, it can be seen that of the 421 cases which were operated upon by the surgeons, 30 (7.1%) developed wound infection. The medical officers operated upon 352 cases and 37 of these (10.5%) became infected. The house doctors performed 227 operations and from these, 32 wounds became infected, an infection rate of 14.1%. Of the 1,000 operations done, 99 wounds became infected, an overall infection rate of 9.9%. The infection rates of the surgeons and medical officers are statistically significantly different whilst there is no significant difference between the infection rates of the medical officers and house doctors.

Table 1 — The Operator

Operator	Number of Operations	Number of Wounds Infected	Percentage of Wounds Infected
Surgeons	421	30	7.1
Medical Officers	352	37	10.5
House Doctors	227	32	14.1
Total	1,000	99	9.9

Statistical analysis

$H_0 : P_1 = P_2$)
$H_1 : P_1 < P_2$) $Z = 1.6673$ — significant at 5% level.

$H_0 : P_2 = P_3$)
$H_1 : P_2 < P_3$) $Z = 1.3055$ — not significant at 5% level.

thus the 7.1% and 10.5% infection rates differ significantly from each other whilst the infection rates of 10.5% and 14.1% do not differ significantly.

Time of operation

The day was divided into three eight-hour sessions, 8.00 a.m., to 4.00 p.m., which are the normal working hours; and two other periods, 4.00 p.m., to 12 midnight, 12 midnight to 8.00 a.m. From Table 2, there were 667 cases operated upon in the 8.00 a.m., to 4.00 p.m. period, resulting in 42 infected wounds, an infection rate of 6.3%. The second highest wound infection rate was in the 4.00 p.m. to 12 midnight group where out of 250 cases operated upon, 28 (11.2%) developed infected wounds. Most wounds became infected when the operation was done between 12 midnight and 8.00 a.m., as 29 wounds (35%) developed infection amongst the 83 cases operated upon. The differences in the infection rates between these three groups of cases are statistically very significant.

Length of operative time

Table 3 shows that 126 operations lasted for 30 minutes or less and here nine wounds became infected, an infection rate of 7.1%. From the 298 operations which lasted between 30 and 60 minutes, there were 23 wound infections, an infection rate

Table 2 — Time of Day

Time of Day	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
8 a.m. to 4 p.m.	667	42	6.3
4 p.m. to 12 m.n.	250	28	11.2
12 m.n. to 8 a.m.	83	29	35
Total	1,000	99	9.9

Statistical analysis

a) $H_o : P_1 = P_2$) $H_1 : P_2 > P_1$) $Z = 2.5132$ very significant at 1% level.

b) $H_o : P_2 = P_3$) $H_1 : P_3 > P_2$) $Z = 4.983$ very significant at 1% level.

Thus the infection rates 6.3%, 11.2%, 35% are significantly very different from each other.

of 7.7%. There were 352 operations lasting 60 to 90 minutes and amongst these 28 wounds became infected, an infection rate of 8%. There were 35 wound infections for the 212 operations in the 90 to 120 minute group, the infection rate being 16.5%. The infection rate for operations lasting more than 120 minutes was 33.3% as there were four wound infections amongst the 12 cases. Statistically, there is no significant difference between the first three groups with infection rates of 7.1%, 7.7% and 8%. But the fourth and fifth groups of cases, with infection rates of 16.5% and 33.3%, differ significantly from the first three groups of cases. There is no statistical difference between the fourth and fifth group of cases.

Type of operation

There were three classes of operations according to whether bacteria were present in the tissues or not at the time of operation and, if present, whether or not the bacteria were actively multiplying, denoting an infective process, Table 4.

(1) **Clean operations**

No bacteria were present in the local tissues, for example a thyroidectomy.

(2) **Contaminated operations**

Bacteria were present in the local tissues as contaminants but were not actively multiplying, there being no infective process present, for example, partial gastrectomy.

(3) **Infected operations**

Bacteria were not only present in the tissues but were also actively multiplying, for example an inflamed appendix with abscess formation.

Table 4 shows that amongst the 316 clean operations done, 17 wounds (5.4%) became infected. For the 242 contaminated operations, there was an infection rate of 7.9% as 19 wounds became infected. The highest infection rate of 14.3% arose from the 442 infected cases which produced 63 wound infections. There is statistically no significant difference between the infection rates for clean and contaminated cases. There is a very significant difference between the infection rates of contaminated and infected cases.

Urgency of operation

These cases were grouped into emergency cases, which needed immediate operation, for example splenectomy, and elective cases, for example, hemithyroidectomy. (Table 5). There were 61 infected wounds amongst 338 emergency operations, an

Table 3 — Length of Operating Time

Time in Minutes	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
0 to 30	126	9	7.1
30 to 60	298	23	7.7
60 to 90	352	28	8
90 to 120	212	35	16.5
More than 120	12	4	33.3
Total	1,000	99	9.9

Statistical analysis

$H_o : P_1 = P_2$) $H_1 : P_2 > P_1$) $Z = 0.1962$ — not significant.

$H_o : P_2 = P_3$) $H_1 : P_3 > P_2$) $Z = 0.1118$ — not significant.

$H_o : P_3 = P$) $H_1 : P > P_3$) $Z = 3.1448$ — not significant.

$H_o : P = P$) $H_1 : P > P$) $Z = 1.4957$ — not significant.

Thus the infection rates of 7.1%, 7.7% and 8% do not differ significantly from one another. The rates of 16.5% and 33.3% do not differ significantly. The last two infection rates differ significantly from the first three infection rates.

Table 4 — Type of Operation

Type of Operation	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Clean	316	17	5.4
Contaminated	242	19	7.9
Infected	442	63	14.3
Total	1,000	99	9.9

Statiscal analysis

$H_0: P_1 = P_2$) $H_1: P_2 > P_1$) $Z = 1.1916$ — not significant at 1% level.

$H_0: P_2 = P_3$) $H_1: P_3 > P_2$) $Z = 2.4732$ — very significant at 1% level.

Thus the infection rates of 5.4% and 7.9% do not differ significantly whilst the infection rates of 7.9% and 14.3% differ significantly.

infection rate of 18%. Of the 662 elective operations, 38 developed wound infections, the infection rate being 5.7%. Thus urgent operations resulted in a much higher infection rate. The difference between the infection rates in the two groups of cases is statistically very significant.

Suture materials used

For suturing deeper structures other than skin either absorbable (catgut) or non-absorbable (nylon, silk, linen) sutures were used (Table 6). Eighty-eight wounds were infected amongst the 763 operations in which absorbable sutures were used, an infection rate of 11.5%. Of the 237 cases in which non-absorbable sutures were used, 11 wounds became infected, the infection rate being 4.6%. Thus wound infection was less frequent when non-absorbable sutures were used for the deeper structures. The difference in infection rates is very significant statistically. However, when wound infection did occur where non-absorbable sutures were used, the infection persisted for a much longer period with persistent discharging sinuses. Quite often these sinuses would only heal up when an underlying non-absorbable suture was first removed.

The use of drainage tubes

Table 7 classifies the cases according to whether or not drainage tubes were used. These were of rubber or plastic and were inserted into the depths of the wound itself or deeper, such as into the peritoneal cavity. Twenty-three wounds became infected amongst 151 cases where drainage was used, a wound infection rate of 15.2%. Only 76 wounds became infected in the 849 cases where drainage was not used, an infection rate of 9%. Therefore more wounds became infected if drainage was used. There is a very significant statistical difference between the two infection rates.

Table 5 — Urgency of Operation

	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Emergency cases	338	61	18
Elective cases	662	38	5.7
Total	1,000	99	9.9

Statiscal analysis

$H_0: P_1 = P_2$) $H_1: P_1 > P_2$) $Z = 6.2322$ — very significant at 1% level.

Thus the infection rates of 18% and 15.7% differ very significantly.

The order of the operation on the operating list

The first and last cases on the operating list for that particular day were analysed (Table 8). Amongst the 121 first cases, four wounds became infected, an infection rate of 3.3%. The 121 last cases produced 17 wound infections, an infection rate of 14%. Thus operations performed earlier were less liable to wound infection than those done later in the day when more cases had already passed through the operation theatre. The difference between the two wound infection rates is statistically very significant.

Antibiotics

Some patients had antibiotic therapy whilst others did not (Table 9). The antibiotics were either given locally to the wound or post-operatively systemically or a combination of the two. Local antibiotic consisted of Rikospray (bacitracin, polymyxin, neomycin mixture) manufactured by Riker Laboratories of Loughborough, England. There were 18 wound infections amongst the 135 cases where only topical antibiotics were used, an infection rate of 13.3%. Of the 221 cases which had combined topical and post-operative systemic antibiotic therapy, seven wounds became infected, an infection rate of 3.2%. Amongst the 268 cases where antibiotics were given, only systemically

post-operatively ten wounds became infected, an infection rate of 3.7%.

In 376 cases, no antibiotics were given and here 64 wounds became infected, an infection rate of 17%. The infection rates of 13.3% when only local antibiotics are used and 3.2% when antibiotics are used locally and systemically post-operatively in combination, are very significantly different statistically. The 3.2% rate is not significantly different statistically when compared with the 3.7% infection rate when antibiotics are given only systemically post-operatively. The infection rate of 17%, when no antibiotics whatsoever are used, is statistically significantly different from the 3.7% infection rate.

Time of wound infection

Table 10 shows that out of the total of 99 infected wounds, 89 manifested whilst the patient was still in hospital. The infection most often appeared on the fourth or fifth post-operative day. There were ten cases of delayed wound infection which presented after the patient was discharged from hospital with an apparently healthy scar. Most of these delayed infections appeared within two months of the patients' discharge from hospital and the longest delay was four months.

Diathermy

In 651 cases, diathermy was used for coagulating and cutting. There were 76 wound infections here (Table 2), the infection rate being 11.7%. There were 23 wound infections amongst the 349 cases where diathermy was not used, an infection rate of 6.6%. The difference between the infection rates of the two groups of cases is statistically very significant.

Table 6 — Type of Suture Material Used

Suture Material	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Absorbable	763	88	11.5
Non-absorbable	237	11	4.6
Total	1,000	99	9.9

Statistical analysis

$H_0: P_1 = P_2$
$H_1: P_1 > P_2$
$Z = 3.363$ — very significant at 1% level.

Thus the infection rates of 11.5% and 4.6% differ very significantly.

Proteolytic enzyme

Chymoral, a trypsin-chymotrypsin mixture, (Armour Pharmaceutical Company, Eastbourne, England), was used in 398 cases, (Table 12). There arose 21 infected wounds from this group, a wound infection rate of 5.3%. There were 78 infected wounds amongst the 602 cases where chymoral was not used, an infection rate of 13%. There is a very significant difference statistically between the infection rates of the two groups of cases.

General health of the patient

There were two groups of patients, those in good general health and those whose general health was poor (Table 13). Patients in poor general health health suffered from various conditions such as dehydration, emaciation, obesity, old age, diabetes mellitus, previous steroid therapy. Seven hundred and thirty-three patients were in good general health and there were 44 wound infections here, an infection rate of 6%. Amongst the 267 patients in poor health, the infection rate was 20.6%, there being 55 wound infections. The difference in the infection rates of the two groups of cases is very significant statistically.

Bacterial spectrum

Table 14 shows that only 68 cases of wound infection yielded bacteria on culture. The commonest bacteria were the Coliform group of organisms, these being cultured in 31 instances. Coagulase positive staphylococcus aureus was obtained from 19 infected wounds, and were the next commonest bacteria. There were only two cases which yielded pseudomonas organisms on culture.

Table 7 — Drainage Tube

	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Drainage tubes used	151	23	15.2
No drainage	849	76	9
Total	1,000	99	9.9

Statistical analysis

$H_0: P_1 = P_2$
$H_1: P_1 > P_2$
$Z = 2.3908$ — very significant at 1% level.

Thus the infection rates of 15.2% and 4.6% differ very significantly.

Table 8 — Order of Case on Operation List

	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
First case	121	4	3.3
Last case	121	17	14
Total	1,000	99	9.9

Statistical analysis

$H_0: P_1 = P_2$
$H_1: P_1 < P_2$
$Z = 2.9812$ — very significant at 1% level.

Thus the infection rates of 3.3% and 14% differ very significantly.

Discussion

Amongst the 1,000 cases, there were 99 infected wounds, a wound infection rate of 9.9%. The Second Surgical Unit, General Hospital, Kuala Lumpur, West Malaysia, from which the figures were produced is a general surgical unit and does not deal with ear, nose, throat, eye, neurological, orthopaedic and cardiac cases. A comprehensive survey in the United Kingdom was reported by the Public Health Laboratory Service (1960) and studied the sepsis rate in 12 British hospitals. The highest rate reported was 26.4% and the lowest 1.8%, the mean sepsis rate being 13.3%. The very low rate of 1.8% was recorded in an orthopaedic unit. From the Public Health Laboratory Service report, in the two hospitals in which most of the cases were recorded, 736 and 816 respectively, the sepsis rate was 13.9% and 13.0% respectively. The figure of 9.9% in the Malaysian patients therefore compares favourably. It is believed that good ward ventilation and lack of cold weather are important contributory factors in the Malaysian setting.

As expected, the two specialist surgeons in the unit had the least number of wound infections despite the fact that they operated on all the major cases such as stomach, oesophagus, gall-bladder, colon and thyroid. They had a 7.1% wound infection rate (Table 1). The medical officers, being less experienced, had a higher infection rate 10.5% which is statistically significantly different from the 7.1% rate. Most infected wounds (14.1%) arose in the cases operated upon by the house doctors as they lacked the degree of skill of their senior colleagues. Furthermore, they also operated on most of the emergency appendicectomies which included purulent, gangrenous and perforated appendices. However, the infection rates of the house doctors and medical officers are not significantly different statistically.

Table 9 — Antibiotics

	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Local Antibiotics only	135	18	13.3
Local Antibiotics and post-operative systemic antibiotics	221	7	3.2
Post-operative systemic antibiotics only	268	10	3.7
No antibiotics	376	64	17
Total	1,000	99	9.9

Statistical analysis

$H_0: P_1 = P_2$
$H_1: P_1 > P_2$
$Z = 3.6633$ — extremely significant at 1% level.

$H_0: P_2 = P_3$
$H_1: P_2 < P_4$
$Z = 0.3432$ — not significant at 1% level.

$H_0: P_3 = P$
$H_1: P_3 < P$
$Z = 5.2536$ — extremely significant at 1% level.

Thus the infection rates of 13.3% and 3.2% are very significantly different. The infection rates of 3.2% and 3.7% are not significantly different. The infection rates of 3.7% and 17% are very significantly different.

From Table 2, it is seen that as the operation day progresses, the wound infection rate rises. Table 3 shows that operations lasting up to 90 minutes all have the same degree of liability to wound infection. All operations lasting more than 90 minutes are equally liable to wound infection. Operations lasting less than 90 minutes are less liable to wound infection than those lasting more than 90 minutes. Smyth (1959) has shown previously that the incidence of wound infection rises proportionately with the duration of the operation.

For the operations which are last on the operating list, the wound infection rate is about four times that of infections done first on the operating list (Table 8). These figures in Tables 2, 3 and 8 support the fact that as more patients, staff and instruments pass through the operation theatre as

the operation day moves on, the bacterial count of the air, instruments and other objects in the theatre rises (Douglas, 1963). A study by Bourdillon and Colebrook (1946) revealed that movements of staff, blankets and dressings resulted in a rise in the bacterial counts of air in the operating theatre. The staff themselves may be carriers of dangerous organisms even though they do not have overt sepsis and may cause wound infection (Shooter et al, 1957). There is much evidence that at least some wound infections are derived from the patient (Howe and Marston, 1962). Indeed, some surgeons do not operate on patients with skin infections, boils, sore throats or upper respiratory infections (Douglas, 1963).

As is expected, the highest wound infection rates follow upon operations which are infected (Table 4). The wounds in clean and contaminated cases are equally liable to infection whilst the infected operations are more likely to produce infected wounds. The study by the Public Health Laboratory Service (1960) accords with these findings.

The urgency of the operation has an important bearing on the incidence of wound infection. For the elective cases, the infection rate was only 5.7% whilst for the emergency cases, this is greatly increased to 18%. Wright et al (1971), in a survey of general surgical operations performed, quoted wound infection rates of 15% for elective operations and 30% for emergency operations.

When absorbable suture materials were used, the wound infection rate 11.5% was higher than when non-absorbable sutures were used, 4.6%. This is in agreement with other published series (Tagart, 1967). However, when infection did occur in those wounds where non-absorbable sutures were used, the infection often persisted until the suture was removed.

The wound infection rate was markedly increased when drainage tubes were used (Table 7). The tubes were inserted in the wound itself or into deeper areas such as the peritoneal cavity. This finding generally agrees with that of other workers (Lancet, 1970). The drain itself may conduct infected material from deeper areas to the wound. Furthermore, bacteria from the skin of the patient may invade the depths of the wound through the drain (Douglas, 1963).

Table 10 — Time of Wound Infection

	Number of Cases
In the ward	89
After discharge from hospital	10
Total	99

Table 11 — Diathermy

	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Diathermy used	651	76	11.7
Diathermy not used	349	23	6.6
Total	1,000	99	9.9

Statistical analysis

$H_0: P_1 = P_2$)
$H_1: P_1 > P_2$) $Z = 2.5743$ — very significant at 1% level.

Thus the infection rates of 11.7% and 6.6% are very significantly different.

Antibiotics have been very effective in the prophylaxis of wound infection in this series (Table 9). This is in contradistinction to reported series from Western countries where with the continued use and abuse of antibiotics, resistant strains of bacteria have developed and the prophylactic value of antibiotics has declined. Some reports on large series of cases have shown no difference in wound infection in patients receiving systemic antibiotics compared with controls (Barnes et al, 1959; Fager, 1957; Hogman and Sahlin, 1957; Rocha, 1962; Sanchez-Ubeda et al, 1958; Thulbourne and Young, 1962).

Other reports have shown an actual rise in the wound sepsis rate in patients receiving systemic antibiotics (Fichtner, 1968; Myers, 1959; Tachdjian and Compere, 1957). Similarly, in contradistinction to the Malaysian patients, in this series, the use of topical antibiotics in Western patients does not appear to be so effective in preventing wound infections. Jackson et al (1971) in a series of 704 operation wounds used the antibiotic Rikospray in the wound just before the skin closure. The results showed that the spray did not prevent most wound infections.

Table 9 also shows that when systemic antibiotics are used post-operatively, the additional use of local antibiotics to the wound during the operation did not significantly reduce the infection rate. The use of post-operative systemic antibiotics, in addition to locally applied antibiotics significantly reduces the infection rate.

It is important to note, as shown in Table 10, that although the wound appears normal and there is no pain, fever or other signs of infection, the wound may become infected later at some time after discharge of the patient from hospital. The outpatient follow-up of all operated cases is therefore made even more important.

In this series of 1,000 patients, there is a marked increase of wound infection when diathermy is used (Table 11). The wound infection rate is almost doubled when diathermy is used. This accords with the findings of Madden et al (1970) who noted the increased susceptibility of wounds to infection when diathermy was used and found that this was due to coagulation necrosis of tissue.

The use of proteolytic enzymes promotes dissolution, absorption and removal of exudate and blood clot in the area of the wound. Thus a good culture medium for bacterial growth is removed and it is to be expected that incidence of wound infection would therefore be reduced. This is confirmed in the present series, there being a 13% wound infection rate when the enzyme was not used whilst the rate fell to 5.3% when the enzyme was used (Table 12).

The general health of the patient is an important factor (Table 13). There were more than three times the number of wound infections in patients in poor general health (20.6%) compared to those in good health (6%).

In this series of 1,000 cases, 99 wounds became infected but only 68 of these grew bacteria on culture (Table 14). In most of the infected wounds where no bacteria were culturable, antibiotics had been used. By far the commonest infecting bacteria were the Coliform organisms, followed in second place by staphylococcus aureus. This is in contrast to Western figures where staphylococcus aureus accounted for more than 60% of the bacteria infecting wounds (Public Health Laboratory Service Survey, 1960).

Summary

A thorough survey of 1,000 unselected consecutive wounds was made in the second General Surgical Unit, Kuala Lumpur, West Malaysia. The findings are generally in agreement with published reports from the Western countries. The important exception in this Malaysian series is that, at least for the time being, antibiotics are extremely effective in the prophylaxis of wound infection. We are now at the stage when antibiotics were first used in Western countries and it is to be hoped that indiscriminate and excessive use of antibiotics as in the West will not lead to the stage where they are not so effective in preventing wound infection.

It is felt that other factors may contribute to the fairly low rate of wound infection in these Malaysian patients. Thus the warm windy Malaysian climate where there is no winter provides good ventilation in the wards. The Malaysian patients are also, on the whole, very much less obese than Western patients. Again, due to shortage of hospital beds, our patients have a very short pre-operative stay in hospital. This factor may contribute to an appreciable fall in the wound infection rate (Wright, 1971).

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Table 12 — Proteolytic Enzyme

	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Chymoral need	398	21	5.3
Chymoral not used	602	78	13
Total	1,000	99	9.9

Statistical analysis

$H_0: P_1 = P_2$
$H_1: P_1 < P_2$
$Z = 3.9926$ — extremely significant at 0.1% level.

Thus the infection rates of 5.3% and 13% are extremely sifinificantly different.

Table 13 — General Health of Patient

	Number of Cases	Number of Wounds Infected	Percentage of Wounds Infected
Good general health	733	44	6
Poor general health	267	55	20.6
Total	1,000	99	9.9

Statistical analysis

$H_0: P_1 = P_2$
$H_1: P_1 < P_2$
$Z = 6.7327$ — extremely significant at 0.1% level.

Thus the infection rates of 6% and 20.6% are extremely significantly different.

Table 14 — Bacterial Spectrum

Bacteria	Number of Cases
Coliform group	31
Staph Aureus (Coagulase +ve)	19
Staph (Coagulase —ve)	11
Proteus group	3
Strept Faecalis	2
Pseudomonas group	2
Total	68

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Radiological investigation of neurological disorders

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THE EDITOR, WRITING in the Malayan Journal of Medicine (1964) hoped that by 1973 there would be five neurosurgical centres in the Federation. One centre has been in operation at the General Hospital, Kuala Lumpur since 1963; a neurosurgical service has been provided at the University Hospital since May 1971 and a neurosurgeon has recently been appointed to the Penang General Hospital. A neurosurgical centre cannot function without the services of a neuroradiological and a neuro- pathology department and facilities for brain scanning, which ideally should be included in the neuroradiological department (Burrows 1972).

During the year, following the establishment of the neurosurgical service at the University Hospital, the number of neuroradiological procedures have more than doubled, and these procedures and cases are reported in this paper.

Materials and Method

During the year commencing June 1st 1971, 208 patients with neurosurgical, neurological or orthopaedic disorders were submitted to neuroradiological procedures, viz. carotid and vertebral angiograms, ventriculograms and encephalograms and myelograms. Every patient has a record of the procedure entered on a small filing card; the diagnosis is subsequently added and the card is filed.

The number of procedures performed during the year commencing January 1970 before the establishment of the neurosurgical service is compared to those performed after its establishment (Fig 1).

During the year commencing June 1971, the following procedures were performed:

135 carotid angiograms all by direct puncture,

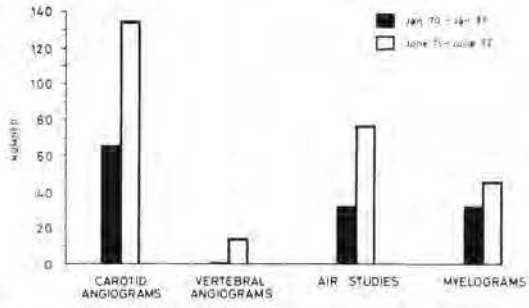

Fig. 1: The number of neuroradiological procedures performed in the year before the establishment of a neuro-surgical service (black) compared with those performed in the first year after its establishment (white).

comprising 20 bilateral and 95 single sided angiograms.

14 vertebral angiograms, nine by direct puncture and five by catheterisation.

77 air studies, comprising 40 ventriculograms and 37 encephalograms.

9 Myodil ventriculograms were performed but these have not been included in Fig. 1 as they followed an air ventriculogram in all cases.

46 myelograms, 45 by lumbar puncture, one by cisternal puncture.

Results

Angiography and air studies are complementary in the investigation of intracranial lesions, so they have been included together in Table 1 which shows the diagnosis in 162 patients with an intracranial lesion and the investigations performed to reach the diagnosis. Angiograms include both carotid and vertebral angiograms and air studies both ventriculograms and encephalograms.

The diagnosis in the 46 myelograms performed is given in Table 2.

Discussion

The number of angiograms and air studies have more than doubled since the advent of neurosurgery at the University Hospital (Fig. 1), but the increase in myelograms has not been so great as these were already being done at the request of the orthopaedic surgeons.

The racial incidence of the total patients admitted to the University Hospital (excluding obstetrics) is almost identical to that of patients undergoing neuroradiological procedures (Table 3). Although not all patients with neurological disease have neuroradiological procedures, it is likely that the incidence of neurological disease and, in particular, neurosurgical conditions is similar in the three ethnic groups in Malaya and it does not appear to be commoner in Indians as was found by Issler (1972).

The largest group of patients investigated were those with head injury in whom carotid angiography

Table 1

Diagnosis of Intracranial Lesions in 162 Patients and Neuro-Radiological Procedures to reach the Diagnosis.

Diagnosis		No. of Patients	Angiograms	Air Studies
Head injury		26	32	0
Subdural haematoma	8			
Extradural haematoma	4			
Carotico-cavernous fistula	2			
Normal angiogram	12			
Tumours		25	23	15
Glioma	13			
Metastases	4			
Pituitary tumours	3			
Meningioma	2			
Neuroma	2			
Haemangioblastoma	1			
Hydrocephalus		23	2	28
Subarachnoid haemorrhage		16	39	0
Aneurysm	6			
Arteriovenous malformation	5			
Normal angiogram	5			
Epilepsy		13	4	10
Intracerebral haemorrhage or thrombosis		12	13	0
Encephalitis and meningitis		9	9	4
Abscess		8	7	6
Vascular stenosis or occlusion		8	9	0
No demonstrable intracranial disease		7	2	5
Tumour excluded	2			
Hyperostosis ? meningioma	1			
Dermoid cyst of skull vault	1			
Thyrotoxic opathalmoplegia	1			
Migraine		4	4	0
Diagnosis unknown		4	5	1
Third nerve palsy	3			
Optic atrophy	1			
Degenerative disease		3	0	4
Failed examination		2	0	2
Atrophy		2	0	2
Total		162	149	77

Table 2

Diagnosis in 46 Patients having Myelograms.

Diagnosis		Number of Patients
Lumbar disc protrusion		12
Cervical spondylosis		7
Extradural lesion		6
Spinal metastases	2	
T.B. spine	2	
Thoracic disc protrusion	1	
Benign haemangioma	1	
Intradural lesion		5
Neurofibroma	2	
Cyst	2	
Arachnoiditis	1	
Brachial plexus trauma		4
Arteriovenous malformation of spinal cord		3
Myelitis		2
Motor neurone disease		2
Syringomyelia		1
Spinocerebellar ataxia		1
Ankylosing spondylitis		1
Tumour invasion of peripheral nerves		1
Normal myelogram — diagnosis unknown		1

was performed to exclude an extracerebral haematoma. In some centres, especially where carotid angiography is not readily available, cases with suspected extradural or subdural haematoma have burr holes made and the haematoma aspirated. If no haematoma is found, then air is introduced and a ventriculogram performed (McKissock et al 1960). In the present series, 12 (46%) patients with head injuries had normal angiograms, but then these patients were spared burr hole aspiration for a suspected haematoma. This requires the use of an operating theatre and furthermore, multiple burr holes have to be performed to diagnose or exclude a subdural or extradural haematoma.

In the group of patients with intracranial tumours, 13 (52%) had a glioma, which is similar to other reported series where gliomata constitute 45% of all intracranial tumours (Brain & Walton 1969).

The majority of patients with hydrocephalus were children and 16 (70%) patients had hydrocephalus secondary to meningitis. Two patients had spina bifida with a meningocoele and three patients had an encephalocoele. In the United Kingdom, the ratio of encephalocoeles to spina bifida is 1:5 (Norman 1962) but in Southeast Asia, encephalocoeles are commoner than spinal meningocoeles

Table 3

Racial Distribution of 208 Patients having Neuro-Radiological Procedures compared with total Hospital Admissions.

Race	Number of Patients having Neuro-radiological Procedures		Total Admissions to University Hospital (excluding obstetrics)
Chinese	121	58%	58%
Indian	50	24%	26%
Malay	29	14%	12%
Orang Asli	5	2.5%	
Others	3	1.5%	4%

with anterior encephalocoeles more common than occipital encephalocoeles (Suwanwela 1969).

The observation at the General Hospital, Kuala Lumpur, of arteriovenous malformations outnumbering aneurysms ten to one, with approximately two-thirds of these lesions having bled (Spillane 1972) were not found in the present series of patients with subarachnoid haemorrhage. Although the number of patients with subarachnoid haemorrhage was not large approximately, one-third had bled from an arteriovenous malformation, one-third from an aneurysm and in one-third the angiograms were normal. In the United Kingdom, aneurysms are nine or ten times as common as arteriovenous malformations in subarachnoid haemorrhage (Brain & Walton 1969). It is now standard practice to perform bilateral carotid and vertebral angiography in patients with subarachnoid haemorrhage.

In only two patients was a diagnosis of cerebral atrophy made. In the United Kingdom, this is a common encephalographic diagnosis and the greater number of patients with atrophy seen there is presumably due to the fact that many more elderly patients are investigated.

The majority of the myelograms were performed in patients with lumbar disc protrusion which were demonstrated in 11 (92%) patients referred with that diagnosis. Myelographic appearances suggested an arteriovenous malformation of the spinal cord in three patients but angiography was not performed to confirm the diagnosis.

Two patients with spinal cord compression, in whom a previous lumbar puncture had been performed, were submitted to myelography. A myelogram should not be carried out within 10-14 days of a previous lumbar puncture as a common subdural-subarachnoid reservoir of cerebro-spinal fluid may be produced in the lumbar region after needle puncture and this may lead to contrast

being injected outside the subarachnoid space (Shapiro 1968). This occurred in one of the patients so Myodil had to be introduced by cisternal puncture.

It is eminently desirable that neuroradiological procedures should be performed by a radiologist who has specialised in this subject. As several cases, especially head injuries, are emergencies, there must be radiographers on call who are proficient in the procedures. If three-quarters of an hour is allowed for a carotid angiogram and one hour for a myelogram or an air study, then these procedures are very time consuming. To obtain the best results expensive radiological equipment is needed, so it is thus better that neurology should be developed at a centre where this sophisticated equipment together with facilities for brain scanning are available.

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Hydatidiform mole: problems in early diagnosis

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HYDATIDIFORM MOLE and its complications can mimic various medical conditions such as pulmonary tuberculosis, anaemia, and cerebro-vascular accidents. As can be seen from one of the cases in this series, unless this condition is diagnosed early and promptly treated, the patient's life may be placed in considerable danger.

Materials and Method

Between January, 1968 and July, 1970, there occurred 14 cases of hydatidiform mole confirmed by histology. These cases have been studied in detail and are presented here. These patients were initially seen either at the Accident & Emergency Unit or the Gynaecological Outpatient Clinic of the University Hospital. On admission, detailed histories were recorded, followed by physical examination and the diagnosis was discussed with the lecturer or consultant on duty.

The incidence of hydatidiform mole in Southeast Asia, as shown by Tow and Fox (1966) of Singapore, and Acosta-Sison and Baja-Pamlilio (1951) of the Philippines, is very high. They were quoted as 1 in 169 and 1 in 145 pregnancies respectfully. In Australia, (Beischer et al 1970) and the United States of America (McCorriston, 1968), the incidence is 1 in 710 and 1 in 1,326 pregnancies respectively.

However, in spite of the high index of suspicion by the medical staff in this unit with regard to this disease, in five cases the diagnosis was initially missed on admission. In view of this, it was considered essential to review some of the difficulties encountered in diagnosis.

The clinical features and the difficulties encountered in interpreting the ancillary aids available at this hospital will be discussed.

Table I

Case No.	Age	Gravida	Parity	Time Interval since last pregnancy in years	Diagnosis on Admission
1	24	4	3	2	Hydatidiform mole.
2	32	7	6	3	Threatened abortion.
3	25	3	2	2	Hydatidiform mole.
4	21	1	0	—	Hydatidiform mole.
5	48	4	3	23	Hydatidiform mole.
6	31	3	2	4	Threatened abortion.
7	31	3	2	2	Hydatidiform mole.
8	23	5	4	1	Septic abortion.
9	25	3	2	2	Hydatidiform mole.
10	36	5	4	5	Threatened abortion.
11	24	3	2	2	Hydatidiform mole.
12	24	?	0	—	Missed abortion.
13	30	3	2	3	Hydatidiform mole.
14	25	3	2	1	Hydatidiform mole.

Age

It is important to realise that hydatidiform mole can occur in any woman of child-bearing age. Earland (1926) commented that before the age of 40, there was no evidence of a significant correlation between age and incidence. His statement, however, has not been substantiated by Findley (1917), Smalbraak (1957) and Chun (1964). These authors were able to show that there is a relatively high incidence of molar pregnancy in the early and towards the end of the reproductive age. Chun (1964) found that the average age of patients with molar pregnancy was 31 years. There was a marked increase in the incidence (6 times) after 39 years. In this small series, nine of the 14 patients were below the age of 30.

Parity

The average parity of the patients was 2.4, and seven patients (50 per cent) were of para 2 or less. In Hongkong and Singapore, Chun (1964) and Tow (1964) showed that there was a higher incidence of molar pregnancy from the third pregnancy onwards and both these workers had shown that for parity 11 and over, the incidence of molar pregnancy was ten times that of normal pregnancy.

Results and Discussion

This series, however, is too small to have any statistical significance. Among the Caucasian patients, however, there was no correlation between multiparity and the frequency of molar pregnancy. This was clearly shown by Beischer et al. (1970) of Australia and MacGregor (1969) of the United States. Beischer commented that 80 per cent of his patients had fewer than three viable pregnancies.

Table II

Presenting Complaints	Number of Cases
Uterine bleeding	14
Amenorrhoea	13
Uterus big for dates	12
Abdominal pain	6
Hyperemesis	6
Passage of molar tissue	5
Toxaemia	4

Uterine Bleeding

This is the most common symptom in molar pregnancy (Beischer et al 1970; Holman and Schirmers, 1948). In this group, all 14 patients had complained of vaginal bleeding. It is usually preceded by a period of amenorrhoea and the type of bleeding may vary from intermittent spotting to continuous loss and it may last for days or weeks. It usually occurred most frequently between eight and 16 weeks. Massive haemorrhage which led to death occurred in one patient. She was initially admitted as a case of threatened abortion. Death from haemorrhage has similarly been reported by Chun et al. (1964), Holman and

Schirmers (1947) and Acosta-Sison and Baja-Pamlilio (1951). These cases clearly reflect the urgency in making a correct diagnosis in molar pregnancy.

Table III

Uterus Big for Dates

Case No.	Amenorrhoea in Weeks	Uterine Size in Weeks
1	17	22
2	8	24
3	15	22
4	22	20
5	16	24
6	12	14
7	10	10
8	17	24
9	8	22
10	12	12
11	10	8
12	20	12
13	16	24
14	11	20

Table III shows the relationship of the uterine size to the period of amenorrhoea. Out of 14 cases, nine cases presented with uterus big for dates, while in three cases the uterine size was small. In Case No. 10, the uterus corresponded to the period of amenorrhoea. In Case No. 11, the patient was referred by a general practitioner after dilatation and curettage of what was thought to be an incomplete abortion. It is seen that excessive uterine enlargement is not pathognomonic of molar pregnancies. This has reaffirmed the view that a uterus of normal or small size does not exclude the diagnosis of molar pregnancy. The incidence of uterus small for dates may be as high as 37.9 per cent (MacGregor, 1969).

Abdominal Pain

This symptom is to be usually expected during expulsion of molar tissue. However, in this present study, only two patients had associated abdominal pain during passage of molar tissue. Abdominal pain without expulsion occurred in seven patients. In Chun et al (1964) series, 34 per cent of patients complained of abdominal pain before the onset of evacuation. She suggested that the mechanism of the pain is due to rapid uterine enlargement.

Hyperemesis

Patients with molar pregnancy often alleged that nausea and vomiting was much more severe than they experienced in previous pregnancies. This occurred in seven patients. In a large series by Chun et al (1964) and Beischer et al (1970), the incidence was 17 and 29 per cent respectively.

Toxaemia

Among the 14 patients, four had a diastolic blood pressure of 90 mm. Hg. or above. Only one patient had a severe degree of hypertension with a blood pressure of 210/100 mm. Hg., associated with ankle oedema. There were no patients with proteinuria.

Several symptoms of toxaemia, such as vomiting, severe headache, hypertension, oedema, albuminuria occurring in the first half of gestation, are said to be common in molar pregnancy, and they are mostly associated with rapid uterine enlargement, as in a quickly growing mole (Smalbaak, 1957). The validity of this statement is supported by Chun et al (1964) in that 72 per cent of their cases of severe toxaemia had the uterine fundus above the umbilicus. In the present series, there are no cases in which the uterine fundus was above the umbilicus.

The incidence of toxaemia in molar pregnancies various between 12.5 per cent (Beischer et al 1970) and 50 per cent (Chun et al 1964).

In these cases, the blood pressure invariably returned to normal after evacuation of the mole. However, in 35 cases of eclampsia in association with molar pregnancy, Meuller and Lapp (1949) commented that three women had eclampsia after delivery of a mole.

Passage of Molar Tissue

The diagnosis of molar pregnancy would have been much easier if there was a history of having passed molar tissue. However, only six patients had this history. To await the passage of molar tissue, before a diagnosis is made, is certainly not ideal, as there may be associated excessive haemorrhage, shock and infection, at the time of spontaneous evacuation of molar tissue.

Luteal Cysts

The incidence of luteal cysts in molar pregnancy varies between 10.4 per cent (MacGregor, 1969) and 73.7 per cent (Beischer et al 1970). The presence of bilateral luteal cysts, however, is difficult to diagnose because of the associated presence of a gravid uterus. The cysts usually have soft thin walls which make them difficult to

palpate. It is therefore not surprising that luteal cysts were not detected in any of the patients in this series. Luteal cysts are probably caused by stimulation of the ovary by the high H.C.G. level. However, they usually disappear spontaneously after evacuation of the mole. In view of this, active treatment of the cysts is not necessary unless complicated by torsion or rupture.

Doptone

The Doptone is a valuable ancillary aid in the detection of the presence of viable intra-uterine pregnancy. It is an ultrasonic detector utilising the Doppler shift phenomenon (the apparent change of frequency of a moving source of sound). Kuah and Embrey (1968), after 12 weeks of gestation, were able to detect foetal circulatory impulses in all cases of live pregnancy, the earliest detection of foetal life being at nine weeks. In the few cases when the foetal heart sound was not heard, the pregnancy soon aborted or was later shown to be a missed abortion or hydatidiform mole. In this series, the Doptone was used in seven cases. All these cases had negative Doptone findings.

Radiographic Diagnosis

Straight X-ray abdominal examination was done in five cases as a preliminary to amniographic study. In all the cases, the uterine size varied between 22 to 24 weeks. No foetal skeleton was detected in any of the patients. Amniogram was performed by transabdominal intra-uterine instillation of radio-opaque dye using 20 ml. of water soluble Diatrizoate Sodium (Hypaque). The syringe was initially withdrawn to exclude the presence of liquor amnii. After injecting the solution, the patient was turned from side to side. All the five patients showed typical honeycomb appearance of the vesicles in the intra-uterine cavity. This method was reported by Terres and Peligrine (1966), with 11 out of 12 patients showing typical appearance of molar pregnancy. Sentus et al (1969), with a larger series of 34 patients, was able to obtain characteristic patterns in all but four cases of molar pregnancy. Recently, Aquero and Zigmelboin (1970) reported a high success rate using oil contrast media 10 phendylate (Myodil).

These workers have shown that there have been no harmful effects to the foetus or mother. This method is useful in developing countries, since it is easily performed and could always be incorporated with the radiographic investigation.

Human Chorionic Gonadotrophin (H.C.G.)

Table IV

Case No.	Gravindex in Dilution	Urine HCG I.U./L.
1	Not done	4.8 x 10⁴
2	1 : 32	5,000
3	1 : 256	40.9 x 10⁶
4	1 : 32	64 x 10⁴
5	1 : 256	26.2 x 10⁶
6	1 : 64	Not done
7	Negative	Not done
8	1 : 512	1.6 x 10⁴
9	1 : 256	40.9 x 10⁶
10	1 : 32	4 x 10⁶
11	1 : 4	Not done
12	1 : 16	Not done
13	Not done	5.1 x 16⁶
14	1 : 1	1.28 x 10⁶

The methods used for estimation of urinary HCG in this unit are by the immunologic haemagglutination-inhibition test of Wide and Gemzell (1960) and by the qualitative latex agglutination test (Gravindex). In the former, a purified HCG preparation (Physex) was used to coat formalinised, tanned sheep erythrocytes. Table IV showed that the urine value of HCG varied between 5,000 international units per litre to as high as 40,900,000 international units per litre. Tow (1966) commented that there is usually a high peak in urinary HCG between 50 and 100 days after the last menstrual period. In Singapore, the mean HCG level in normal pregnancy during this period is 20,000 to 40,000 international units per litre. In our experience, any value above 50,000 international units per litre was compatible with the presence of molar pregnancy. However, one has to concur with Tow that any attempt to establish definite diagnostic level, which would differentiate between normal and abnormal pregnancies, will inevitably lead to errors because such an inflexible approach does not take into account the normal pattern of chorionic gonadotrophin at various stages of normal pregnancies in different patients. However, Table IV showed that, of the ten cases in which this investigation was performed, the value of HCG obtained in nine cases was certainly much higher than that suggested by Tow for normal pregnancy.

The qualitative latex agglutination tests (Gravindex) are simple inexpensive tests which can be

performed easily by inexperienced personnel and are therefore particularly suitable for use in the poorer developing countries in Southeast Asia and Africa. In our 14 patients, 1 in 32 dilution is compatible with molar pregnancy. However, in the 11 cases in which this was performed, three cases were below this level. The higher level was 1 in 512 dilution.

Conclusion

From this paper, it can be seen that the diagnosis of molar pregnancy in Malaysia can be a problem to the clinician, since there is no single specific sign, symptom and investigation which is pathognomonic for this disease per se.

Summary

This paper presents 14 cases of molar pregnancy in the University Hospital, Kuala Lumpur, Malaysia. In spite of the high index of suspicion for this disease in this unit, five cases were misdiagnosed at the time of admission. The various symptoms and signs and ancillary aids available at this hospital are discussed.

Acknowledgement

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Mechanism of hyperthermia in the interaction between pethidine or imipramine and monoamine oxidase inhibitors

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IN PATIENTS RECEIVING treatment with monoamine oxidase (MAO) inhibitors, normal therapeutic doses of pethidine or tricyclic antidepressant have caused severe and often fatal toxic reactions characterised by symptoms which include excitement and a pronounced hyperthermia (Taylor, 1962). Similar hyperthermic reactions occur in rabbits given these drug combinations (Loveless and Maxwell, 1965).

These interactions have been attributed to a decreased breakdown of the pethidine or imipramine since monoamine oxidase inhibitors are known to inhibit detoxifying enzyme systems in the liver (London and Milne, 1962). However, the symptoms evoked in humans by the pethidine/MAO inhibitor interaction suggest central stimulation rather than the depression which occurs when detoxication of pethidine is impaired (Rogers and Thornton, 1969). Moreover, the onset of toxic symptoms occurs within a few minutes of pethidine administration to patients receiving monoamine oxidase inhibitors, whereas in patients with hepatic dysfunction the toxic effects of pethidine develop slowly and only after repeated doses (Dundee and Tinckler, 1952). In view of the atypical features of the reactions, it seems more likely that it may arise as a consequence of raised level of brain monoamines as there is evidence that the integrity of hypothalamic monoamine stores is associated with the maintenance of body temperature (Feldberg and Myers, 1963).

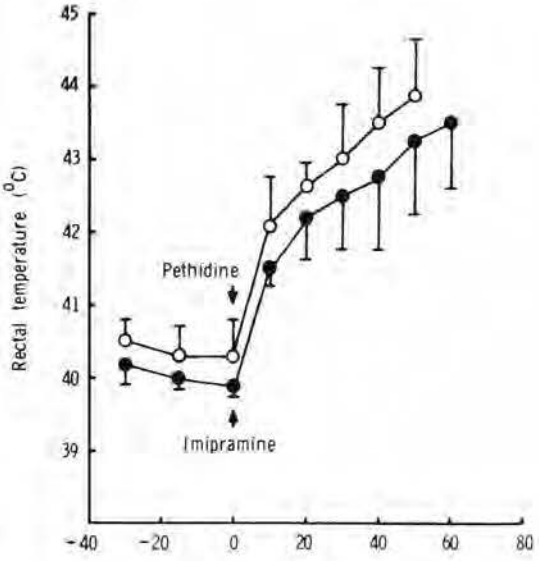

Fig. 1
Effect of pethidine and imipramine on the body temperature of rabbits pretreated with pargyline.

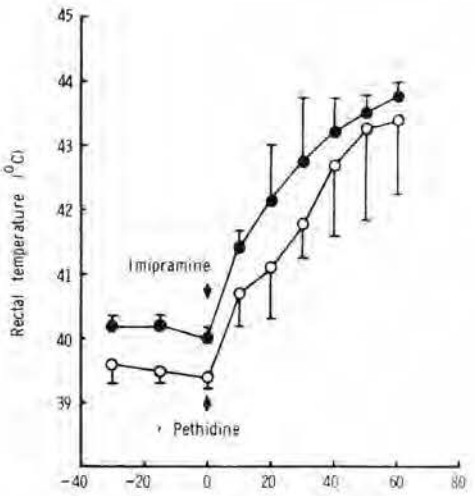

Fig. 2
Effect of pethidine and imipramine on the body temperature of rabbits pretreated with reserpine and pargyline.

We, therefore, investigated the role of the brain monoamines in hyperthermia induced by pethidine of imipramine in rabbits pretreated with pargyline with drugs that selectively alter the concentration of brain monoamines.

Methods

The experiments were performed on male Californian rabbits weighing between 1½ and 2½ kg. Rabbits were pretreated with two daily doses of monoamine oxidase inhibitor, pargyline (25 mg/kg s.c.). Preliminary studies showed that such a regime was a suitable pretreatment as subsequent injection of pethidine or imipramine at a dose of 5 mg/kg invariably evoked a hyperthermic response.

On the day of the experiment, the rabbits were placed in head stocks for the recording of rectal temperature. A period of 30 minutes was allowed for the rabbits to settle in the stocks before pethidine or imipramine was infused slowly into the marginal ear vein at a rate of 1 mgm/kg/minute. Three rabbits were used in each group.

Drugs used and their dosage schedules were: reserpine (0.5 mg/kg) intraperitoneally (I/P) for two days prior to pargyline pretreatment, alpha-methyl paratyrosine (80 mg/kg) (I/P) 12 hourly for two days in combination with pargyline and p-chlorophenylalanine (125 mg/kg) daily (I/P) for three days prior to pargyline pretreatment. The drugs were dissolved in sterile apyrogenic solution.

Brain monoamines were measured in rabbits given the above drug dosage schedules. Control and drug-treated animals were killed by air embolism. The brains were rapidly removed from the skull and the cortex and cerebellum were dissected off and discarded. The brainstem was frozen in liquid nitrogen until used for assay. Following butanol-heptane extraction, the concentrations of noradrenaline, dopamine and 5 hydroxytryptamine were measured fluorimetrically.

Results

In the rabbits pretreated with pargyline, the injection of either pethidine or imipramine rapidly evoked a marked hyperthermia (Figure 1). This was accompanied by bouts of shivering, motor restlessness and profuse salivation. The animals died in hyperthermia some 50-60 minutes after injection.

Pretreatment with reserpine or alpha-methyl paratyrosine failed to antagonise the drug-drug interaction (Figs. 2 and 3) but pretreating with

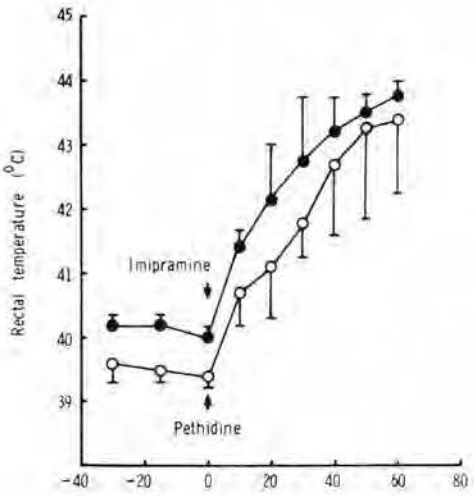

Fig. 3
Effect of pethidine and imipramine on the body temperature of rabbits pretreated with alpha-MT and pargyline.

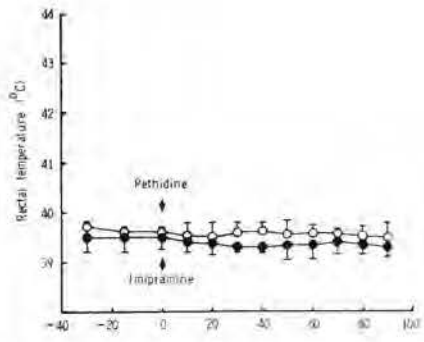

Fig. 4
Effect of pethidine and imipramine on the body temperature of rabbits pretreated with PCPA and pargyline.

p-chlorophenylalanine completely antagonised it (Fig. 4).

Figs. 5 to 7 show the changes in the concentration of the brain monoamines given the drug dosage schedules as described. The results are expressed as percentage change. Pargyline caused increases in the concentration of all cerebral monoamines (Fig. 5) while reserpine caused a marked fall of all the amine levels and the combination of the two drugs caused a rise only in 5 hydroxytryptamine (Fig. 6). Alpha-methyl paratyrosine alone depleted noradrenaline and dopamine without affecting 5 hydroxytryptamine (5HT) but when combined with pargyline, the 5 hydroxytryptamine level was increased (Fig. 7). P-chlorophenylalanine selectively depleted the 5HT level and it remained low even when combined pretreatment with pargyline (Fig. 8).

Discussion

In the present study, the role of brain monoamines in hyperthermia induced by pethidine or imipramine in rabbits pretreated with pargyline was investigated with drugs that selectively alter the concentration of brain monoamines. The drugs used were reserpine which depletes the stores of catecholamines and 5 hydroxyteryptamine, alpha-methyl paratyrosine (a tyrosine hydroxylase inhibitor) inhibits the synthesis of catecholamines and P-chlorophenylalanine (a trytophan hydroxylase inhibitor) prevents the synthesis of 5 hydroxytryptamine.

The overall results show that reserpine and alpha-methyl p-tyrosine failed to antagonise the interaction between pethidine or imipramine with monoamine inhibitors and they failed to prevent the rise in cerebral 5 hydroxytryptamine following monoamine oxidase inhibition. On the other hand, pretreatment with p-chlorophenylalanine completely antagonised it. This drug blocked the rise in 5

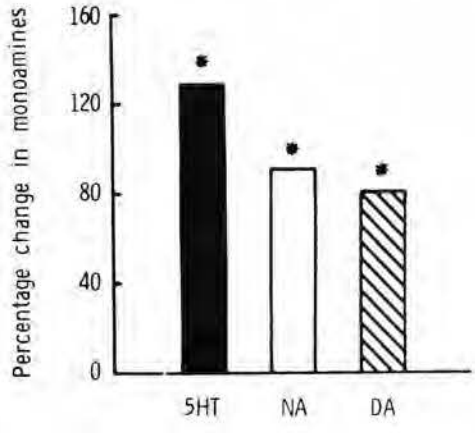

Fig. 5
Effect of pargyline on the concentration of monoamines in the rabbit brainstem.

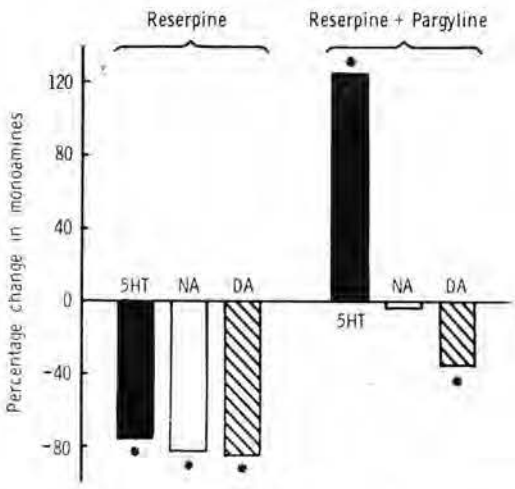

Fig. 6
Effect of reserpine and reserpine and pargyline on the concentration of monoamines in the rabbit brainstem.

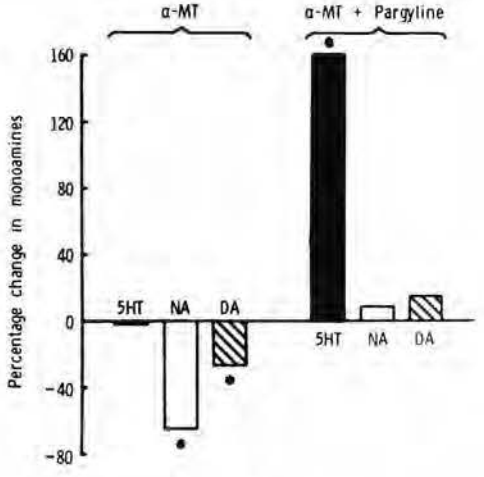

Fig. 7
Effect of alpha-MT and pargyline on the concentration of monoamines in the rabbit brainstem.

hydroxytryptamine without preventing the rise in catecholamines.

The results indicate, therefore, that the interaction between pethidine or imipramine and monoamine oxidase inhibitors can take place only in the presence of raised levels of cerebral 5 hydroxytryptamine.

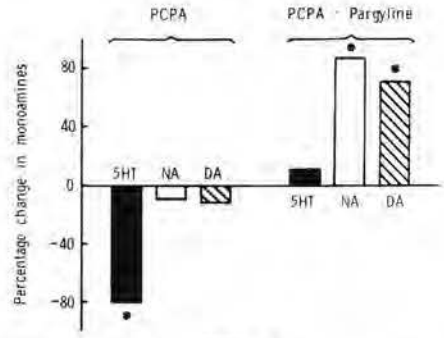

Fig. 8
Effect of PCPA and PCPA and pargyline on the concentration of monoamines in the rabbit brainstem.

Rogers and Thornton (1969) have shown that acute toxicity (LDSO) of pethidine is increased in mice pretreated with the monoamine oxidase inhibitor and this only occurs when the 5 hydroxytryptamine content of the brain is 60% above control values. Hence it is tempting to postulate that pethidine/monoamine oxidase inhibitor interaction occurs when pethidine causes a rapid release of 5 hydroxytryptamine content (Burke and Long, 1967) in the brain to a critical level.

Summary

The administration of pethidine or imipramine to rabbits pretreated with pargyline evoked a hyperpyrexial reaction. This drug-drug interaction was not antagonised by reserpine or alpha-methyl p-tyrosine but completely antagonised by p-chlorophenylalanine. Changes in the concentration of pethidine or imipramine and monoamine oxidase inhibitors can take place only in the presence of raised levels of 5 hydroxytryptamine content of the brain.

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Lichen planus: variations in Indians

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Introduction

SINCE ERASMUS WILSON described lichen planus a century ago, variations of this condition has been found especially in the American Negroes (Winer and Levitt, 1947) and in the Jews with darker complexion (Dostrovsky and Sagher, 1949). Fasal (1945) reported that in Malaya, lichen planus was similar to those occurring elsewhere. This statement is not born out in skin clinics, for both the classical type and variations are seen.

Material

The purpose of this paper is to review the variations of lichen planus as seen in Indians. A total of ten patients, forming about 0.5% of new patients seen in a year in the skin clinic of the University Hospital, were personally studied. The clinical diagnosis was confirmed in each case by biopsy. The patients were classified into the following groups according to the clinical appearance:

(i)	Acute and confluent	1
(ii)	Subacute classical	4
(iii)	Subacute facial	3
(iv)	Subacute nodular	1
(v)	Hypertrophic	1

(The number of patients in each group is shown in Arabic numerals)

Clinical appearance and characteristics

A 14-year-old boy developed the acute type. The lesions started on the lower limbs and within two months practically every part of the body except the groins, the face and the periphery of the limbs was covered with discrete and confluent lesions of bluish-grey hue. The greyish colour was particularly noticeable on the top surface of the confluent lesions (Fig. 1). The mucosa and the nails were spared.

The subacute facial type had some resemblance to both the subtropical type (Dostrovsky and Sagher, 1949) and the lichen planus actinicus. Flat-

Fig. 1
Acute and confluent. Greyish colour noticeable on the surface of the lesion.

Fig. 2
Subacute facial. Papular flat-topped lesions on the angle of the jaw. Lesion along the ramus of the mandible is diffuse and darker in colour.

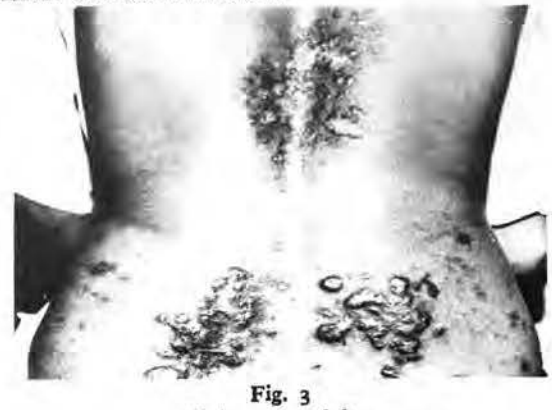

Fig. 3
Subacute nodular.

topped papular lesions, forming both linear and circinate pattern were found on the jaw with the older lesions having a bluish colour (Fig. 2). Annular lesions resembling granuloma multi-forme were found on the forehead. The rest of the body was spared. The patients with this type were all males between 20 and 30 years of age, and the average duration of the lesion was six months at the time of the first examination.

A 27-year-old housewife developed the subacute nodular lesions over a period of four months. Bluish grey nodular eruptions of various sizes were found on the flexor surface of both forearms, and on the lumbo-sacral region on either side of the spinal column (Fig. 3). The lesions were much bigger than those found in all the other types. The nails showed longitudinal ridging.

The hypertrophic type was present for six years on the ankle of a 14-year-old boy. It formed a plaque, 8 × 2 cm with a verrucous surface of dark bluish hue and irregular edges (Fig. 4). The glans penis also showed lichen planus but the patient was not aware of the duration of this lesion.

The subacute classical type was in no way different from those found in patients elsewhere. Largest number of patients were found in this group and all were females between the ages of 30 to 50 years. One patient showed annular lesion on the ankle (Fig. 5).

Histology

The dermal infiltrate were not entirely of lymphocytes (Lever, 1969), but monocytes, plasma cells and even eosinophils were also found, the latter particularly in the acute type. In addition melanin, both extracellular and intracellular was found in the dermal infiltrate in all types of lichen planus, the greatest concentration being found in the subacute classical type (Fig. 6). The saw-toothed appearance of the rete pegs, due both to the degeneration of the basal cells and to the distortion by the tight packing of the infiltrate in the dermal papillae, was most marked in the acute type than in the others (Fig. 7). The colloid bodies in the

Fig. 4
Hypertrophic. Verrucous with irregular edges.

epidermis was found only in the acute type (Fig. 8).

In the subacute facial variety (the annular lesion), the dermal infiltrate was less dense compared to the other types and it was not closely hugging the epidermis. However, other features of lichen planus, including the collection of melanin, were seen. The nodular type showed the characteristic dome-shaped dermal papillae with collection of melanin and sparse infiltrate of cells between the saw-toothed rete pegs (Fig. 9). Cellular infiltrate was also found in the deeper dermis. In the hypertrophic type, hyperkeratosis was most marked, the epidermis was hyperplastic and the dermo-epidermal junction was more well defined, as could be expected in long-standing lesions (Thyresson and Moberger, 1957).

Treatment and duration of the disease

All the patients were followed up for a period between 18 months to two years from the time of their first visit to the clinic. Oral steroid therapy was given both to the subacute classical and the acute type, starting with 60 mg. daily and being tailed off within six months. The patient with the acute type showed the most dramatic response, the lesions beginning to fade off within six months with almost complete clearance but for the residual pigmentation. The subacute classical type showed poor response. The nodular and subacute facial type had topical steroid therapy for over a year and showed complete clearing of the lesion, again with residual pigmentation. The hypertrophic type has entered the eighth year with neither spreading of the lesion nor any response.

Comment

Although the number of patients studied was small, the features of lichen planus in Indians is variable compared to those described in the West. However, some of the features which are reported here resemble those found in the American Negroes (Winer and Levitt, 1947). During the period of observation, lichen planus was not seen in the other two ethnic groups who together form more than 80 per cent of the population. Therefore, an incidence of 0.5% is probably accurate and it falls within the range of figures reported elsewhere. Classification of lichen planus in this report somewhat resembles that of Samman (1961) although various other ways has been reported in world literature.

Incontinence of melanin pigment is a feature in all types of lichen planus, both in the young and old lesions. This pigment definitely comes from the basal layer of the epidermis, for the latter layer immediately above the lesion is devoid of melanin compared to that at the edge of the lesion. The bluish hue of the lesions instead of being violet as described in the West, is remarkable and this may be due to the accumulation of melanin in the dermis, as Findlay (1970) reported that the blue colour of the skin arises from a particular

Fig. 5
Annular lesion on both ankles.

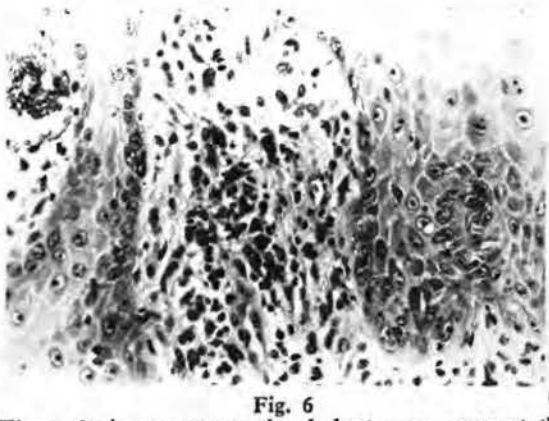

Fig. 6
The melanin appears as the darkest areas amongst the infiltrate between the rete pegs. (H.E. stain x 25).

relationship between collagen and melanin which leads to a subtractive colour mixing in the light reflected from the dermis.

Colloid bodies in the lichen planus were believed to be due to a vegetating, low molecular virus (Thyresson and Moberger, 1957). Although they were able to find these bodies in all types of lichen planus, the author found them only in the acute type, which had a very short natural history and dramatic response to steroid. These characteristics may support the contention that virus may play a part in the aetiology of the acute lichen planus.

The subacute facial type, though resembling the lichen planus actinicus of the tropical and subtropical areas (Rook, Wilkinson and Ebling, 1969) the eruption over the jaw has not been described before. The nodular variety was most unusual and the clinical diagnosis was uncertain till a biopsy was done. The large size of the individual lesion was striking.

Although the value of steroid therapy is controversial the acute type responded very well to oral therapy and the subacute facial and the nodular type to topical therapy. Undoubtedly the natural history of the above three types was shortened by the therapy.

Summary

Five types of lichen planus seen in Indians are described. Though the classical type was the commonest, variations not described elsewhere were found. The presence of melanin in the dermis, which is striking in all types of lichen planus, is an additional characteristic feature of the histology of lichen planus. The blue colour of the lesion is probably due to the abovementioned feature. The duration of lichen planus in individual patients seems to depend largely upon the type of lesions they develop. Steroid therapy both oral and topical has a place in the management of lichen planus.

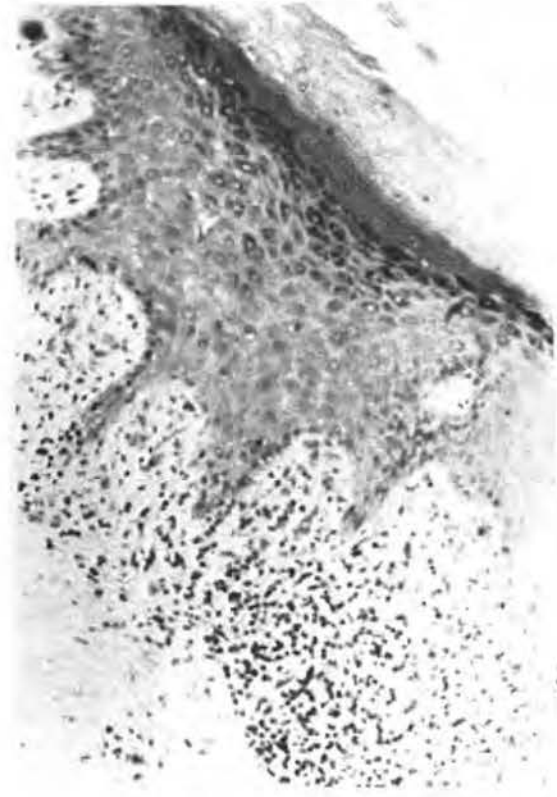

Fig. 7
The saw-toothed appearance of the rete pegs (H.E. stain x 10).

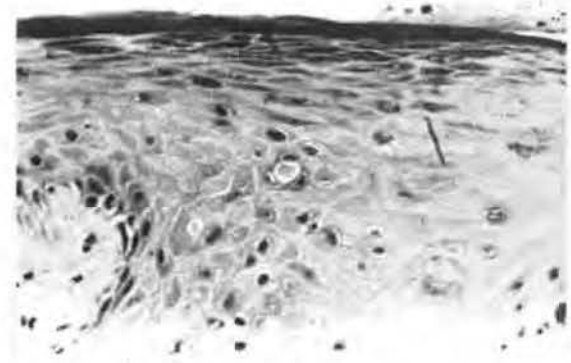

Fig. 8
Colloid bodies seen as "rounded" bodies with a clear halo (H.E. stain x 25).

Fig. 9
The dome-shaped dermal papillae in the nodular type (H.E. stain x 10).

Acknowledgments

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Pseudohypoparathyroidism: a case report and family study

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IN 1942, ALBRIGHT and his associates described three patients with characteristic somatic features and hypoparathyroidism. Injection of parathyroid extract in these patients produced a poor phosphaturic response in comparison to that evoked in idiopathic hypoparathyroidism. They suggested, therefore, that these patients did not have a deficiency of parathyroid hormone (PTH) but rather an end organ refractoriness to the effects of PTH. This hypothesis was further supported by the finding of normal parathyroids in one of these subjects and they described the disorder as pseudohypoparathyroidism. This paper records the first case and family study of pseudohypoparathyroidism reported in Malaysia. Tan and Cheah reported a similar case from Singapore in 1967.

History

L.K.H., a 12-year-old Chinese male, was first admitted to the University Hospital, Kuala Lumpur, on 6th July, 1970 with a history of recurrent generalised fits since May 1969. His milestones were normal and he had an average school performance in a regular school. He had a febrile fit in 1958 at the age of six months, but had remained well from then till May 1969. Since then, he had suffered about 11 fits. There was no history of paraesthesiae or carpo pedal spasms.

Physical examination

His height was 127.5 cm. (less than 10th percentile on the Malaysian scale) (Chen) and weight 29.2 kg. (30th percentile on the Malaysian scale) (Chen). The patient was thus short and stocky. His facies was round (Fig. 1) and the fingers of both hands, particularly the fourth and the fifth digits, were short and thick (Fig. 2). The finger nails were short and broad, especially those of the thumbs. The eyes showed bilateral pseudopapilloedema, with no enlargement of the blind spot. His chest was thickset. Chvostek's sign was positive but Trousseau's sign was negative. The central

Fig. 1
Patient showing round facies and short stature.

nervous system was normal. Exostoses were noted in the lateral aspect of the sole of the left foot and between the thumb and index finger of the right hand. His dental formula was:

UJ	2	1	0	3
	2	1	0	3
LJ	2	1	0	2
	2	1	0	1

Laboratory investigations

Full blood count and urinalysis were normal. Serum calcium was low 3.6 mEq/L (normal 4.7 — 5.5 mEq/L) and inorganic phosphate high 6.2 MgP% (normal 2.2 — 4.6 MgP%). His serum magnesium was normal 1.5 mEq/L. (normal 1.4 — 2.2 mEq/L). Phosphaturia as measured by the phosphate excretion index (Nordin and Smith) was very low, minus 0.21 (normal ± 0.09). His blood urea was 20 mg%. The alkaline phosphatase and acid phosphatase were 17 KA units/100 ml. and 5.9 KA units/100 ml. respectively. The electrocardiogram showed a prolonged QTc of 0.54 seconds. His waking electroencephalogram revealed occasional paroxysmal bilateral synchronous theta activity which was also present with some spikes intermixed during hyperventilation, suggesting an epileptiform disturbance of primary subcortical origin. Sleep electroencephalogram was normal.

Radiological investigations

The hands and feet showed abnormally short metacarpals and metatarsals especially of the fourth and fifth digits (Fig. 3). Soft tissue calcification was evident in the periarticular soft tissue of the right second metacarpophalangeal joint. His teeth showed delay in eruptions of the canines on both sides of the lower jaw. In the upper jaw, three deciduous teeth was still present. The skull and chest were normal.

Family study

The patient's mother and three of the five siblings were physically examined and blood samples were taken for serum calcium and inorganic phosphate. They were all found to be normal except for one elder sister, aged 16 years. She was asymptomatic. On examination, she was noted to be obese with a round facies and short stature. Her height was 147.3 cm. Her fingers were short, especially the fourth and fifth digits. Her fundi were normal. Chvostek's and Trousseau's signs were negative. Her serum calcium was 4.7 mEq/L and inorganic phosphate 2.6 mgP%. Roentgenograms of the hand demonstrated marked shortening of the metacarpals, especially of the fourth and fifth digits. This sibling thus showed somatic features of pseudohypoparathyroidism without the biochemical features and would thus fit in the category of pseudo-pseudo- hypoparathyroidism as described by Albright, Forbes and Henneman in 1952.

Discussion

The features of pseudohypoparathyroidism have been well reviewed by Cohen and Donnell (1960) and Papaioannou (1963). The main somatic features of this syndrome include short stature, obesity, a round facies and short metacarpals and metatarsals. Mental retardation may also occur. Tetany, convulsions or combination of the two were reported in 88% of the cases. The short broad finger nails of the thumbs seen in the patient reported here is also a striking clinical feature.

Radiologically, the most common abnormalities are shortening of metacarpals and metatarsals, soft

Fig. 2
Hands showing inspicuous 4th and 5th knuckles due to short 4th and 5th metacarpals.

Fig. 3
Roentgenograms of the hands showing brachydactylia with short 4th and 5th metacarpals. Exostoses between thumb and index finger of left hand are also seen.

tissue calcification, cerebral calcification and abnormalities in dental development.

The most consistent biochemical abnormalities are an elevated serum inorganic phosphate, low serum calcium and low phosphaturia. The low level of phosphaturia does not usually respond to injections of parathyroid hormone (Ellsworth Howard Test) but this feature is not consistently found (Mamou and See).

The somatic, radiological and biochemical features in this patient are clearly consistent with the diagnosis of pseudohypoparathyroidism. Familiai occurrence of pseudohypoparathyroidism or the closely related syndrome of pseudo-pseudohypoparathyroidism is well recognised (Cusmano, Talbot, Lackmann). In the case reported, the patient's sister, aged 16 years, shows definite evidence of pseudo-pseudohypoparathyroidism. Inheritance is thought to be a sex-linked dominant transmission (Schwarz and Bahner).

Treatment and progress

The patient was treated with a high calcium and a low phosphate diet consisting of calcium 2mEq/Kg body weight per day and phosphorus less than 600 mg. per day. He remained free of fits on the above diet and the fundi reverted back to normal after ten weeks. However, Chvostek's sign was still positive.

Dihydrotachysterol 25,000 units per day was then added to this regime. Fourteen weeks after initiating this treatment, his serum calcium was 4.0 mEq/L and inorganic phosphate 5.9 mgP/100 ml.

Summary

A case of pseudohypoparathyroidism is reported. He presented with generalised fits and was found to have the characteristic somatic, radiological and biochemical features of pseudohypoparathyroidism. A family study showed one sister to have the characteristic somatic, radiological and biochemical features of pseudo-pseudohypoparathyroidism.

Acknowledgement

I am most grateful to Dr. S. Paramsothy for referring this case to us and Dr. H.O. Wong and Dr. A. Nadarajah for encouragement and permission to publish this case.

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Localised gigantism of the extremities

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LOCALISED GIGANTISM of the extremities may be caused by a number of distinct clinical entities. The literature abounds with descriptions of various conditions and the nomenclature is confusing. This paper presents some illustrative examples of patients suffering from localised gigantism of the extremities and an attempt is made to propose a practical classification.

Illustrative cases

Elephantiasis Neurofibromatosa

Case No. 1: This is a 14-year-old Chinese girl who presented with a longer and larger left leg since childhood. On examination, she was found to have typical cafe au lait spots and multiple neurofibromatosa over her body. The left leg was larger and longer below the knee. X-rays of this leg show obvious soft tissue enlargement and lengthening and widening of the left tibia (Fig. 1). She elected to have no treatment and was lost to follow up.

Macrodystrophia lipomatosa

Case No. 2: A 84-year-old Chinese female who presented with a larger and longer right leg and a grotesque right foot since childhood. She gave a history of recurrent ulcerations over the dorsum of the left foot. There was no positive family history.

On examination, the right leg was longer and broader both in the thigh and leg. The right foot was grotesquely enlarged and there were two ulcers over the dorsum of this foot (Fig. 2). In addition, there were multiple sessile subcutaneous lipomata scattered especially in the leg with a much larger oblong lump just below the groin.

Fig. 1
Elephantiasis Neurofibromatosa: X-ray showing the left tibia and fibula to be longer and broader. There is also soft tissue enlargement.

Fig. 2
Macrodystrophia lipomatosa: The grotesque enlargement of right foot and toes.

Fig. 3
Macrodystrophia lipomatosa: Exostosis over the right greater trochanter.

Fig. 4
Macrodystropnia lipomatosa: Exostosis over the head of fibula. Notice periosteal reaction and broadening of the tibia and fibula.

Fig. 5
Macrodystrophia lipomatosa: Broadening of the tibia and fibula.

Fig. 6
Macrodystrophia lipomatosa: Antero-posterior X-ray of right foot showing enlargement, ankylosis and arthropathy.

Fig. 7
Macrodystrophia lipomatosa: Lateral X-ray showing some features as Figure 6.

Fig. 8
Macrodystrophia lipomatosa: Magnified view showing the arthropathy.

Skeletal surveys revealed exostosis in the region of the right greater trochanter (Fig. 3) and the right upper fibula (Fig. 4); broadening of the right tibia with periosteal reaction (Figs. 4 & 5); bony ankylosis and arthropathy in the right foot (Figs. 6, 7 & 8). X-rays of the left leg and foot showed no abnormality.

Klippel-Trenaunay Syndrome

Case No. 3: A six-year-old Chinese boy, who presented with overgrowth of the left thumb. According to the parents, this was noticed in infancy and gradually increased in size.

On examination, the left thumb was twice as large as the right thumb. The web between the left thumb and index finger was occupied by a large firm swelling and on auscultation a definite bruit was heard. X-rays are reproduced in figure 9.

The enlargement clearly involves soft tissues as well as bone. A clinical diagnosis of haemangioma was made. Unfortunately, the parents refused surgery and thus no histological confirmation was possible.

Case No. 4: A 14-year-old Chinese girl, who pre-

Fig. 9
Klippel–Trenaunay Syndrome: Radiograph showing enlargement of the left thumb — soft tissue and bone.

sented with a larger and longer right leg (figs. 10 & 11). The right leg was noticed to be definitely larger than the left since the age of one month and has been enlarging progressively. There was associated pink discoloration of this leg and over the last years this has assumed a blue black character. In addition, this leg had a tendency to bleed on the slightest trauma but there was no history of a generalised bleeding diasthesis. There was no similar disorder in the parents or her siblings.

On examination, the right leg was lengthened by two inches and the girth was also larger — being three inches bigger in the calf. There was a peculiar blue black discoloration of the leg and nodules of thrombosed vessels could be felt. There was no palpable thrill or audible bruit but there was definite increase of local temperature.

On skeletal survey, a few areas of shallow notchings were noted in the long bones (Fig. 12).

Fig 10
Klippel – Trenaunay Syndrome: Haemangiomatosis. Larger and longer right leg. Notice the discoloration and the irregular nodules.

Fig. 11
Klippel – Trenaunay Syndrome: Haemangiomatosis. Close-up view showing the discoloration and nodules.

Fig. 12
Klippel – Trenaunay Syndrome: Haemangiomatosis. Radiography showing superficial notches in the fibula.

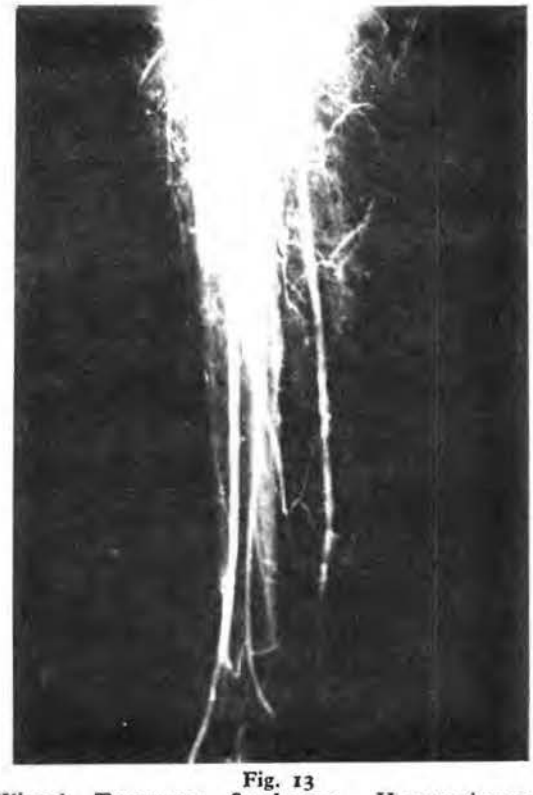

Fig. 13
Klippel – Trenaunay Syndrome: Haemangiomatosis. Arteriogram showing marked vascularity and numerous capillaries coursing around the soft tissues.

Arteriography was carried out and on injecting the femoral artery, there was almost instant filling of the femoral vein. In addition, there was marked vascularity of the leg with numerous capillaries coursing around the soft tissues. No distinct arteriovenous fistulae were demonstrated (Figs. 13 & 14). This picture is consistent with generalised haemangiomatosis. After much debate, she was given a course of radiotherapy with moderately good response.

Case No. 5: A 10-year-old Malay girl, who presented with a longer and larger right leg and was noticed to limp ever since she started walking.

On examination, the whole right leg from the thigh downwards was grossly enlarged. The right hip was obviously dislocated. There was diffuse blue black and pinkish discoloration over almost the whole limb. There were also numerous varicosities and the whole limb felt very much warmer. On auscultation, definite bruit was heard over various parts of the limb.

Radiological examination confirmed the dislocated right hip (Fig. 15). The femur and tibia and fibula were long and fragile looking (Figs. 16 & 17) and in Figure 17, scattered streaks of opacity could be seen in the region of the tibia with one of these overlying a notch in the tibia. In addition, there was pathological fracture of the lower tibia and fibula.

The clinical diagnosis was unilaternal gigantism due to congenital arterioverous fistulae. Unfortunately, the parents did not agree to limb ablation or further investigation. Hence there is no histological or angiographic confirmation.

Discussion

A practical classification for localised gigantism of the extremities is proposed (Table I). The term dysplasia is used to denote disturbed development and growth. From the pathological point of view hamartomatous malformation could be a more accurate term. However, this is not only clumsy but the word hamartoma invites confused connotations. The classification proposed is not meant to displace all others but we feel that it is practical and also stresses the basic lesion in each group.

Fig. 14
Klippel – Trenaunay Syndrome: Haemangiomatosis. Close-up view of arteriogram.

Fig. 15
Klippel-Trenaunay Syndrome: Congenital A.V. fistulae — grossly enlarged right leg with pathological dislocation of right hip.

Fig. 16
Klippel-Trenaunay Syndrome: Congenital A.V. fistulae — fragile looking femur with marked soft tissue swelling Streaks of calcification in soft tissues.

Table I

1. **Congenital Dysplasias**
   - (a) **All elements of connective tissue affected**
     - (i) Congenital Hemihypertrophy
     - (ii) Congenital Macrodactyly
   - (b) **One element of connective tissue predominantly affected**
     - (i) Elephantiasis neurofibromatosa
     - (ii) Macrodystrophia lipomatosa
     - (iii) Klippel-Trenaunay Syndrome
       - — haemangiomatosis
       - — A.V. fistulae
     - (iv) Congenital lymphodema
     - (v) Bone dysplasia
       - — Olliers disease
       - — Melorheostosis
2. **Acquired conditions**
   - Lymphatic Blockage
     - — Filarial elephantiasis
     - — Brawny Arm of Cancer Breast
     - — Others

Fig. 17
Klippel–Trenaunay Syndrome: Congenital A.V. fistulae — fragile looking tibia and fibula with pathological fracture dislocation of the ankle. Streaks of calcification in the soft tissue and one of these overlies a notch in the upper tibia.

Congenital hemihypertrophy is a developmental condition where there is hypertrophy of all the elements of the connective tissue. A further distinguishing feature is that the hypertrophy involves the head and trunk in addition to the extremities.

In congenital macrodactyly, there is also hypertrophy of all the elements of connective tisue, but in this condition the enlargement involves only the digits.

Elephantiasis neurofibromatosa is known to be associated with plexiform neuromata related to a particular nerve. The radiology of the condition is well reviewed by Hunt and Pugh 1961 and Edeiken and Hodes 1967. **Case No. 1** shows features typical of the disease but no histological confirmation was available.

Macrodystrophia lipomatosa is a term coined by Werthemann in 1952, although the condition was first described by Oosthuizen et al in 1947 as "lipomatosis involving bone". **Case No. 2** shows all the typical clinical and radiological features of the disease.

The Klippel-Trenaunay Syndrome comprises a group of conditions where local gigantism results from congenital angiomatous malformations. **Case 3 and** 4 represent manifestations of haemangiomatosis. In **Case 5** the most likely basic lesion is congenital arteriovenous fistulae although no pathological or angiographic confirmation was available.

Summary

A simple scheme is proposed to classify local gigantism in extremities based on the predominant basic lesion.

Five personal cases are described to illustrate gigantism associated with neurofibromatosis, lipomatous, haemangiomatosis and congenital arteriovenous fistulae.

Acknowledgement

We wish to thank the Director-General of Health, Datuk (Dr.) Hj. A. M. Ismail, for permission to publish these cases. We also like to thank Dr. A.K. Mukherjee, Consultant Radiologist, for conducting the arteriographic studies on **Case No. 4.**

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A field study of Depo-Provera:

its use as a contraceptive method by women in a rural town in West Malaysia from February 1968 to December 1969

by Hew Wai Sin
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INTRODUCTION ON THE PROGRAMME

THE STUDY OF Depo-Provera, pharmacologically known as Medroxyprogesterone Acetate, a long-acting progestestional agent given as a single intra-muscular injection, has been made since 1958 for the treatment of endometriosis and threatened or habitual abortion. Probably fifty or more field and/or clinical trials of Depo-Provera have already been made for the treatments mentioned above and also as a contraceptive method. However most of the past studies dealt more on the clinical aspects of the drug but this study is more concerned with the field aspects and its popularity as an additional contraceptive method to be offered by the National Family Planning Board (N.F.P.B.), Malaysia.

The national family planning programme in Malaysia was first started in June, 1966 with the inauguration of the N.F.P.B. Malaysia when the Family Planning Act No. 42 of 1966 was passed in Parliament. The operational service programme began in May, 1967 with the opening of seven family planning clinics at maternity hospitals under the first phase of its Operational Service Programme at the seven large municipalities, involving a total population of about 1.5 million. By the end of 1969, when Phase III of the service programme, planned to extend family planning services to all the remaining district hospital areas and some main and sub-health center areas, covering another 1.5 million persons, the N.F.P.B., Malaysia had 63

main clinics and 310 satellite stations throughout the country. Since then, the oral pill has been the mainstay of the Malaysia programme with a consistent monthly average of about 92.0% of all its family planning acceptors registered as taking the pills, 2.0% on I.U.D.'s, 3.5% in favour of sterilisations (mostly tubal-ligations performed post-partum at hospitals), 1.0% using condoms and 1.5% trying on other methods which included the injection method (Depo-Provera) at a later period from February, 1968.

This study was started with the advice of Dr. Ralph Ten Have, who was then consultant to the Board and was sent by the Center for Population Planning, University of Michigan, under the Technical Assistance Scheme provided by the Ford Foundation. The authors also acknowledge the invaluable assistance given by both Dr. M. Subbiah and Dr. Nor Laily binti Dato' Abu Bakar of the N.F.P.B., Malaysia and Dr. Yuzuru Takeshita of the University of Michigan.

Purpose of the study

The national programme relies heavily on only one method of contraception, the pills. Depo-Provera, which has been used since 1959, works in about the same way as oral contraceptives to prevent conception and like the pills, it has been found to be acceptable, safe and effective. Also due to some well-known though minor side-effects of the oral pill and often-times the adverse publicity of the pills in the press, the Board approved that a continuous field-study be carried out on women in a rural area in Malaysia to find out the acceptability, practicability and popularity of Depo-Provera as an additional injectable contraceptive method to be offered to the people. The study was designed to find out if side-effects, such as amenorrhea, spotting and other complaints, were experienced by women using this method of contraception. Many of these women tolerated the minor menstrual disturbances and still preferred the injection to any other method, but should they discontinue, a follow-up interview was made in this study to find out their reasons for discontinuation, what it was that bothered them most, and so on. This study covers all the patients (550) who have accepted the injection method from the start of the injection programme from 23rd February, 1968 till the cut-off date on 31st December, 1969.

Study areas

The area selected for this study is a village called Sungai Besar, situated about 80 miles northwest of Kuala Lumpur, the capital of Malaysia. A mobile team, consisting of a medical doctor, assisted by two trained nursing staff from the Board in Kuala Lumpur, visited the clinic which is located at the subhealth centre, once in every two weeks at the beginning to provide family planning services. Now, the family planning clinic is being staffed by a trained nurse and an assistant nurse, both of whom have been trained and are employed by the Board on a regular fulltime basis.

Sungai Besar is located in the district of Kuala Selangor. The district population was estimated to be about 63,254 in 1965 and they were made up of about 90% Malays, 10% Chinese and the rest of the Indian and other ethnic group of population is assumed to be negligible. This population structure is, however, different from the overall racial composition of about 50% Malay, 37% Chinese and 13% Indian and other ethnic group of population in the whole country. In this study area, the Malays are mostly in agriculture while the Chinese are in business and fishing along the sea-coast.

Fertility trend in the area

The number of births registered at police stations and health centers in the district of Kuala Selangor for 1966-1969 was obtained and the population of the area for that period based on the 1965 electoral-roll population, was calculated at an annual increase rate of 3%.

The estimated population and fertility trend of the area are shown in the following table.

Table 1

Estimated Population and Fertility Trend of district of Kuala Selangor (1965 Electoral-roll Population 63,254)

Year	Population Estimated	Number of Births Registered	Crude Birth Rate (Per 1,000 Pop.)
1966	65,150	3,172	48.7
1967	67,110	3,538	52.7
1968	69,120	2,847	41.2
1969	71,190	2,890	40.6

Table I shows an evidence of a high fertility pattern typical perhaps of the rural areas in Malaysia but the decline in birth rate between

1966-1969 does not necessarily indicate the effectiveness of the injection study project. It was noted that the first family planning session began on 23rd February, 1968 when the injectable steroid was offered as the main method of contraception. It would be interesting to observe the future trend of fertility in the area.

Material and method

Depo-Provera is being supplied in the form of a sterile, aqueous suspension of 50 mg./ml. and previous studies show that various dosages, ranging from 50 mg. to 200 mg., had been injected at varying periods of time, ranging from every month to every six months into the deltoid muscle or the buttocks of the women taking the drug. The 150 mg. dosage has been found in past studies to be most acceptable as a contraceptive method.

We wish to place on record the kind assistance that was given by Dr. T. Vecchio, Director of Medical Research, the Upjohn International Company, Kalamazoo, Michigan. The Depo-Provera used by the Board in this study was supplied by the Upjohn Company in 3 cc. vials containing 50 mg./cc. of Medroxyprogesterone Acetate. An injection containing the above was used for intramuscular injection at 3-month intervals. The injection method was given free and without any age limitation to any married woman who wanted it as a contraceptive method. On the day of the initial injection, the woman was given a registration card and a return appointment was scheduled for three months from that date.

Tabulation of results

The individual questionnaires were edited, coded and then punched on cards. The three independent variables, Age at Acceptance, Ethnic Group and Number of Living Children, were examined and cross-tabulated against other selected variables but prior to this, the punched cards had been checked and verified for wild-codes by the use of the Center for Population Planning computer programme and the computer at the University of Michigan.

Results

This study is centered on interviews of women who have discontinued use of the injection method. Interviews were made at the patients' homes by two selected female field interviewers who knew their local rural area and the local spoken languages well. They were trained at the central office for a week. An interview took on an average of ten minutes to complete. None of the patients refused to be interviewed.

A total of 550 women accepted the injection as a method of contraception at the Sungai Besar Family Planning Clinic during the 23-month period under study, and at the cut-off date on December, 31st, 1969, 318 (58%) were still receiving regular injections at three-month intervals. The rest of the women (232) discontinued use of the injection; 176 of them (176/550 = 32%) were interviewed while the other 56 women (10%) were lost to follow-up, due mainly to migration (91%).

The 550 injection acceptors who have been registered since the start of the injection study programme in this area are compared with the overall family planning acceptors who have been reported for the cumulative period May 1967 - December 1969 throughout the country. It is observed that 52% of all the injection acceptors under study were below 30 years while the overall figure for the whole country was 56%. The injection acceptors under study and having three or less number of living children were found to be 34% compared to 43% for the whole country. The injection study area chosen is somewhat typical in ethnic composition of a rural town in the state of Selangor. In our injection study, 75% of the injection acceptors were Malays and 22% were Chinese, compared to 45% Malays, 43% Chinese and 12% for the rest of the overall family planning acceptors registered throughout the whole country during May 1967 to December 1969.

If it is assumed that one injection would protect a woman from getting pregnant for a three-month period, the retention rates at the end of 12 and 24 months were 63% and 41% as shown in Table 2. These continuation rates were fairly high and were as good as those for the oral pill which is the main contraceptive method provided since the beginning of the operational service programme of the Board in May, 1967.

In comparison with ethnic groups of the population in the district, the Chinese comprising about 10% of the district population, seemed to have a higher proportion using (21%) the injection method as a contraceptive. The proportion of the Chinese women lost to follow-up (34%) was also significantly higher, an indication of perhaps more mobility among the Chinese in this area. However, except for a small number of Indian women with a high rate of discontinuation, there was not much difference in **continuing** the method between the Malays (246/409 = 60%) and the Chinese (68/122 = 56%).

The younger age-group of women seemed to have a higher proportion of discontinuation. Over

Table 2:

Patient Retention by Number of Months since Entering Programme

Possible number of Injections	1	2	3	4	5	6	7	8
Possible number of Months Protected	3	6	9	12	15	18	21	24
No. who started in cohort	550	525	458	424	364	291	203	91
No. of Patients Protected	550	434	326	265	201	152	99	37
Prop. of Retention (%)	100	83	71	63	55	52	49	41

half (56%) of those women who were interviewed (176) came from women below 30 years. About 75% of these women were not using injection as a contraceptive method at the time of interview and about 22% who probably have restarted the injection method, answered that they were still using the injection method at the time of interview in June, 1970.

Proportion of discontinuation was found to be higher among the lower parity women with three or less number of living children for all injection acceptors.

For each individual, reported complaints regarding side-effects since her last injection were recorded on her individual client record card at each injection. It was found from this source that the frequency of reported amenorrhea seemed to persist, regardless of the length of continuing with method. Complaints of spotting and bleeding decreased immensely when the women continued longer with this method.

The findings of this study show that amenorrhea (35%) seemed to have most bothered the women who discontinued the injection method.

Table 3

Percentage of Patients Still Using or Discontinuing Injection Method By Age.

Age Group	Total Injection Acceptors		Still Using		Status in Programme			
					Drop-Outs			
					Total		Discontinued	Lost to Follow-up
	%		%		%			
Under 20	100	(44)	43	(19)	57	(25)	(20)	(5)
20 - 24	100	(138)	58	(80)	42	(58)	(43)	(15)
25 - 29	100	(105)	56	(59)	44	(46)	(36)	(10)
30 - 34	100	(132)	63	(83)	37	(49)	(34)	(15)
35 - 39	100	(79)	62	(49)	38	(30)	(22)	(8)
40 or more	100	(45)	49	(22)	51	(23)	(20)	(3)
Not available	100	(7)	86	(6)	14	(1)	(1)	(0)
TOTAL	100	(550)	58	(318)	42	(232)	(176)	(56)

Table 4

Percentage of Patients continuing or discontinuing Injection Method by Ethnic Group

Ethnic Group	% District Population	Total Injection Acceptors	Still Using	Status in Programme		
				Drop - outs		
				Total	Discontinued	Lost to follow-up
	%		%	%		
Malay	= 90	100 (409)	60 (246)	40 (163)	(137)	(26)
Chinese	= 10	100 (122)	56 (68)	44 (54)	(35)	(19)
Indian & Other	*	100 (19)	21 (4)	79 (15)	(4)	(11)
Total	100 (63,250)	100 (550)	58 (318)	42 (232)	(176)	(56)

*negligible percentage.

Irregular bleeding (20%) and other medical side-effects (11%) were the other main complaints that caused women in this area to discontinue using injection as a contraceptive method. None of the women in this rural area discontinued because of objection from the husband or other members of the family but 24% of the women did not say why they discontinued.

In studying the pregnancy history of the women after they received the first injection, it was found that the date of birth of the first or subsequent pregnancy after the injection was unavailable but but the status of the pregnancy in relation to initial acceptance of the injection method was obtained. It was found that 37 (21%) of the women interviewed (176) were pregnant at least once after they received the first injection. Of these cases, seven were pregnant within the injection protection period, nine women were pregnant after the protection period of the last injection and the condition of the rest (21) were indeterminable due to lack of information.

Among the 176 women who discontinued using the injection method, 23% of them said they were satisfied with the method. Only one woman answered in the negative but 76% made no comment when asked.

There was only one suspected method failure recorded among the 550 women who registered for injection as a contraceptive method at this clinic during the 23 months under study from February 1968 to December 1969.

Conclusion

Depo-Provera (150 mg.) injected once every three months appears to be simple, acceptable, popular and effective as well, as a contraceptive method among women in a rural town in Malaysia. Acceptance of the method has been good and continuation of use has been very encouraging. The main cause of discontinuation seemed to have come from amenorrhea while irregular bleeding also bothered them very much. Acceptance among the younger age-group and the lower parity women was good though the proportion of discontinuation was found to be higher in both these types of women.

It is noted that similar findings and conclusions regarding the complaints, acceptability, popularity and effectiveness as well, have been arrived at in almost all past studies on the clinical and/or field aspects for women using the Depo-Provera as a contraceptive method.

The injection method continues to be provided to women in this rural area in Malaysia and the Board intends to carry on this continuous field study of the acceptability, popularity and the effects of the drug as a contraceptive method in this area. Meanwhile, more and more women are coming forward to accept this method of contraception and there is a growing demand for Depo-Provera in other parts of the country as well. Possibly, it may be added on to the list of contraceptive methods available at all the Board's clinics throughout the country in the near future.

Table 5

Percentage Distribution of Patients by Number of Living Children by Current Status in the Injection Programme.

Number of Living Children	All Injection Acceptors		Still Using		Status in Programme				Total Drop-outs	
					Drop-outs					
					Discontinued		Lost to follow-up			
0	0.2	(1)	0	(0)	0.6	(1)	0	(0)	0.4	(1)
1	5.3	(29)	3.4	(11)	6.8	(12)	10.7	(6)	7.8	(18)
2	14.2	(78)	12.6	(40)	15.3	(27)	19.7	(11)	16.4	(38)
3	14.0	(77)	14.5	(46)	13.1	(23)	14.3	(8)	13.4	(31)
4	13.4	(74)	13.5	(43)	15.3	(27)	7.1	(4)	13.4	(31)
5	11.4	(63)	11.3	(36)	12.5	(22)	8.9	(5)	11.6	(27)
6	12.4	(68)	14.3	(46)	8.0	(14)	14.3	(8)	9.4	(22)
7+	29.1	(160)	30.2	(96)	28.4	(50)	25.0	(14)	27.6	(64)
Total	100	(550)	100	(318)	100	(176)	100	(56)	100	(232)

Table 6

Percentage Distribution of Complaints Reported by Patients who returned for Injection by Number of Months since First Injection

Months since First Injection	Total Reports Recorded		TYPE OF COMPLAINT			
			None	Amenorrhea	Spotting	Other
0 — 2	100	(445)	55.5	4.0	24.5	16.0
3 — 5	100	(346)	58.1	2.0	28.3	11.6
6 — 8	100	(270)	49.3	5.9	35.2	9.6
9 — 11	100	(217)	59.4	1.9	31.3	7.4
12 — 14	100	(163)	65.7	1.2	28.2	4.9
15 — 17	100	(110)	64.5	2.7	27.3	5.5
18 or more	100	(76)	71.1	1.3	26.3	1.3
Total	100	(1627)	57.9	3.1	28.7	10.3

Source: = clinic records

Table 7
Reasons for Discontinuing Injection

Reasons	% Discontinued
Because of Pregnancy	6.2
Medical: (i) Amenorrhea	34.7
(ii) Irregular bleeding	19.9
(iii) Other side-effects	10.8
Want more children	3.4
Objection from husband	0
Objection from other members of family	0
Other reasons	0.6
Not available	24.4
Total	100 (176)

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Filariasis blood survey in Kelantan

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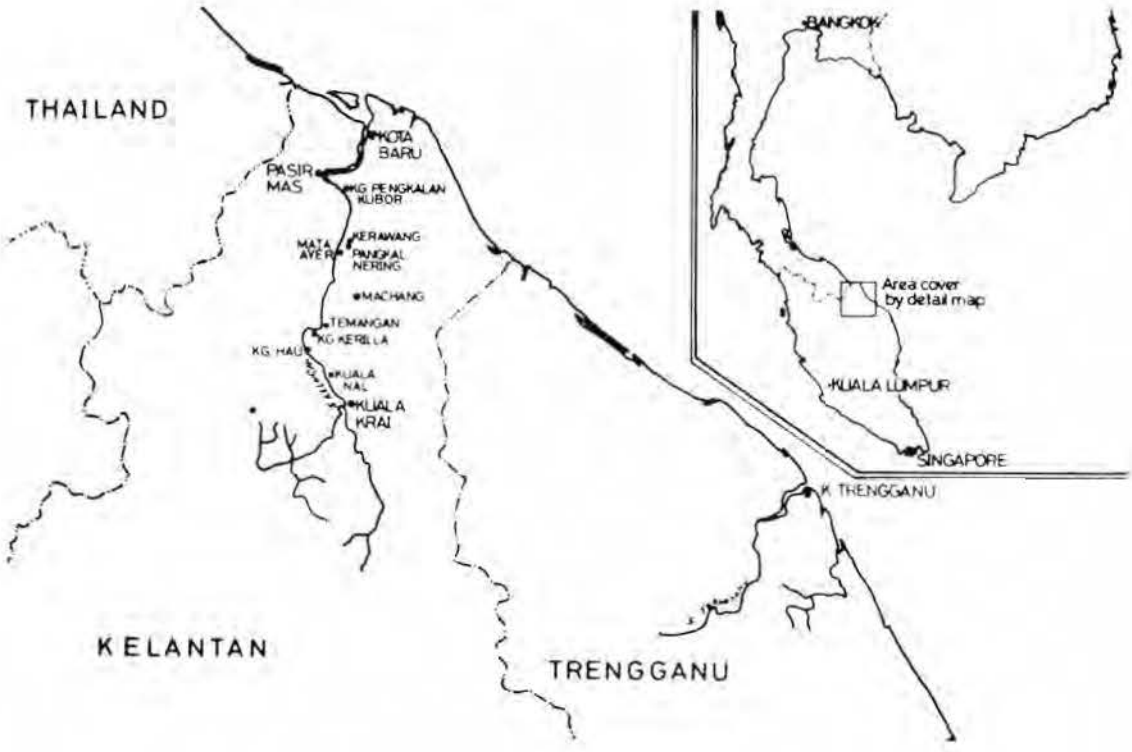
IN WEST MALAYSIA endemic filariasis is closely associated with riverine areas, such as the environs of the Pahang, Rompin, Perak and Bernam Rivers, and with certain open rice growing regions as in Kedah, Province Wellesley, and Lower Perak. The primary parasite is **Brugia malayi,** in its periodic and sub-periodic forms, while the less common **Wuchereria bancrofti** is found in scattered rural foci, usually coexisting with **B. malayi.** (Wilson 1961, Ramachandran 1970).

No published information is available on either the presence or absence of filariasis in the heavily populated regions of Kelantan, which are both riverine and produce paddy. There is, however, filariasis all around these regions. Appreciable prevalences (15-20%) of **B. malayi** have been reported among Orang Asli (Aborigines) in the interior areas of Ulu Trengganu — Fort Chabai, Fort Betis, and the Nenggiri River and Perias River areas. (Wharton et al 1963; Onyah 1967). Both Malayan and bancroftian filariasis have been found south of Kelantan in a riverine-paddy growing area of Trengganu (Ramachandran et al 1970). To the north, **B. malayi** focally affects much of southern Thailand, including Narathiwas Province, adjacent to the Kelantan border (Harinasuta et al 1970; Guptavanij et al 1971 a, b). Therefore in April-May 1972, a team from the Filariasis Research Division, Institute for Medical Research, Kuala Lumpur, with the assistance of the Health Department of Kelantan, undertook a filariasis blood survey in several regions along the Kelantan River.

Study area and population

After examining records of filariasis-like cases collected by the Chief Medical and Health Officer, Kota Bharu, numerous inquiries were made with



local medical officers, public health inspectors, hospital assistants, kampong headmen and local people in four districts, seeking information on the occurrence of elephantiasis and suggestive symptoms, such as inguinal lymphadenitis, lymphangitis and hydrocele. On the basis of these preliminary investigations and of inspections of the terrain, four areas in three districts bordering on the south side of the Kelantan River were selected as reasonably likely to have filariasis. There were Kg. Pengkalan Kubor near Salor in Kota Bharu district, Kgs. Kerawang, Pangkal Nering and Mata Ayer near Pulai Chandong in Machang district, Kgs. Kerilla and Hau near Temangan also in Machang district, and Kg. Kuala Nal near Kuala Kerai in Ulu Kelantan (see map).

The study sites were in low-lying regions comprising paddy fields interspersed with small wooded areas, many growing rubber. The kampongs were adjacent to or within several miles of the Kelantan River. The entire region is seasonal, being quite dry from February through about September and experiencing monsoon rains from October through January, frequently with local flooding. No swampy areas were found which persisted long into the dry season. Paddy fields are irrigated during that time, however, in the Pengkalan Kubor region. The subjects were all volunteers, ranging from infants to the very old, and represented in most areas a majority of the inhabitants, although accurate census figures were not readily available. Each area was visited several days before the survey by a public health team, headed by Mr. C.R.S. Maniam, Chief Public Health Inspector, Kelantan, who gave a talk and showed lantern slides. The response of the kampong people to the study was generally enthusiatic.

Materials and methods

All specimens were collected after dark commencing at 1915 hours. Measured 20 cmm thick blood films were prepared from finger pricks using a modified Sinton pipette. Films were stained the following morning as per routine with dilute Giemsa (35 drops in 100 cc buffered water, pH 7.2) and later examined thoroughly for microfilariae with 6 x occulars and 10 x objective. Subsequently, the films were examined under oil for malaria

parasites by the Division of Malaria Research, I.M.R., Kuala Lumpur.

Results

Our initial inquiries revealed little if any filariasis-like disease coming to local medical attention, and little or no public awareness of the classical signs and symptoms. There were, however, a few anecdotal reports of the occasional individual past or present with a big leg, or hydrocele.

As shown in the table, among the 1,151 blood smears examined, none were positive for microfilariae.

Three "big legs" were found. However one of these was the result of chronic osteomyelitis with gangrene; one a badly swollen chronically ulcerated limb, not necessarily suggestive of filarial elephantiasis, in a man who had years before come from Pahang, an endemic area; and one was a rather bizarre unilateral multi-cystic lesion of the thigh, also not suggestive of filarial disease.

The malaria findings are listed in the table.

Discussion

Numerous preliminary enquiries in the coastal Bachok district failed to suggest the likelihood of endemic filariasis there. In the other districts investigated, Kota Bharu, Machang and Ulu Kelantan, we selected four riverine, paddy-growing areas as most likely to have filariasis. These areas are scattered over a distance of 40 miles along the south side of the Kelantan River. In all the individual areas we surveyed, none of the local inhabitants examined appeared to have filariasis.

While the existence of filariasis is by no means ruled out by this enquiry and limited "spot" survey, the infection would appear unlikely to be of major public health significance in this area of the state. However, the more remote interior regions of Ulu Kelantan inhabited by Orang Asli apparently are affected as **B. malayi** as noted above. Furthermore, we encountered informal reports of elephantiasis cases among Malays in towns along the railway line interior from Kuala Kerai.

We are presently at a loss to explain this unexpected apparent absence of filariasis in the areas examined. The preliminary nature of the study did not allow entomological observations. Possibly, appropriate vector mosquitoes do not breed locally. Any further studies in the area should include mosquito trapping.

The malaria rates were appreciable only in the area of Kg. Kerilla near Temangan. Four cycles of residual DDT spraying had previously been completed in the study areas as part of the National Malaria Eradication Project.

Summary

In April-May 1972, a "spot" blood survey was conducted in four localities in an area extending 40 miles along the south side of the Kelantan River. In all, 1,151 blood smears were collected; not a single case of filariasis was found. While it does not exclude the occurrence of filariasis in the populated riverine section of Kelantan, this limited study, plus the results of local enquiries, show that filariasis there is not a major public health problem.

Malaria prevalence rates were low in all except one of the four localities. The Malaria Eradication Program had previously conducted four cycles of DDT spraying in the study areas.

Table

Results of Examination of Blood Films from Kelantan for Microfilariae and Malaria Parasites.

Kampong	District	Sub-District	Number Examined	Positive for Microfilariae	Positive for Malaria					Percent
					falcip.	vivax	malariae	S.U.*	Total	
Pengkalan Kubor	Kota Bharu	Selor	143	0	—	2	—	—	2	1.4
Kerawang	Machang	Pulai Chandong	125	0	—	—	—	—	0	0
Pangkal Nering	„	„ „	185	0	2	1	—	—	3	1.6
Mata Ayer	„	„ „	156	0	—	1	—	—	1	0.6
Kerilla	„	Kerilla	193	0	4	6	4	4	18	9.3
Hau	„	„	20	0			1	1	2	10.0
Kuala Nal	Ulu Kelantan	Kuala Kerai	329	0	1	3	1	1	6	1.8
Combined	—	—	1151	NIL	7	13	6	6	32	2.8

* Species undetermined, infection usually of very low density.

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Correspondence

Misuse of Fansidar

Sir,

It has come increasingly to our attention that Fansidar (Roche) is being employed prophylactically against malaria in several parts of West Malaysia, particularly on estates in Johore. The adult dosage commonly given has been one tablet (500 mg sulfadoxine & 25 mg pyrimethamine) once a month. This is grossly inadequate practice for several reasons.

Currently Malaysia, like much of Southeast Asia, is experiencing an increase in chloroquine-resistant falciparum ("S.T.") malaria. Aside from quinine, Fansidar is one of the very few effective treatment drugs for this parasite, and by far the easiest to administer. However, despite the recent local introduction of this drug, the spectre of resistance has already appeared (Fung, W.P., *Aust. N.Z.J. Med.* 3: 262-264, 1971; Lewis, A. & Ponnampalam, J.T., unpublished data; O'Holohan, D.R., unpublished data). As with virtually all the antimalarials, the potential for increased resistance seems likely. There would appear no better means of promoting resistance than the widespread and indiscriminate prophylactic use of the drug, particularly if administered in insufficient dosage.

At the present time, the status of Fansidar as a prophylactic (or suppressive) is experimental. Trials in various parts of the world, including Malaysia, have proved very promising but the optimal dosage and time intervals have not yet been established. When used experimentally at one-month intervals, the adult dosage has been in the range of three tablets, but some malaria, both falciparum and vivax, has broken through none the less. One tablet once a month is obviously inadequate.

Even if an ideal prophylactic regimen could be established, many experts would still question the advisability of using a key treatment drug, particularly a long acting drug, for mass prophylaxis, although there might well be individual situations where its prophylactic use would be indicated. The risk to the general public of losing the therapeutic effectiveness of such a drug must be weighed carefully against the temporary advantages of prophylaxis. Besides, there are a variety of reasonably effective non-treatment prophylactic drugs already available.

In summary, Fansidar appears an excellent treatment drug, especially for chloroquine-resistant falciparum malaria although a few cases of Fansidar-resistance have already emerged. Presently, the use of the drug in malaria prophylaxis is experimental and even if it does prove beneficial and a proper regimen is established, one must still question the advisability of its use for mass prophylaxis because of the risk of increased development of resistance. We, therefore, feel that the mass prophylactic use of Fansidar at this preliminary stage with an adult dose of only one tablet once a month is reprehensible.

We are, etc.,

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Book Reviews

MANSON'S TROPICAL DISEASES by Charles Wilcocks and Sir Philip Manson-Bahr 1972, 17th Edn. 1164 pp. 466 figs. and 14 colour plates. Bailliere Tindall, Lond. Low-priced edn. (ELBS) £3.50.

THE APPEARANCE OF a low-priced edition of this most valuable text on tropical medicine, which made its first appearance in 1898, is a great boon to the medical student and the general practitioner. In this new edition, most of the text has been rewritten to eliminate dead wood and allow for new developments, and many new illustrations have been added. The contents have been rearranged to emphasise their aetiology, and special stress is laid throughout on biology, epidemiology and immunology. Emphasis has been laid on diseases as they affect the indigenous and expatriate inhabitants of warm climates. Selected references, invaluable to the research worker, are now included.

RADIOLOGY IN RENAL DISEASE — Brit. Med. Bull. Vol. 28 No. 3. Sept. 1972, British Council, Lond. £2.50.

THIS SYMPOSIUM OF 15 papers by 24 British contributors of high standing should have a wide reading public among radiologists, radio-diagnosticians, nephrologists, virologists, pathologists as well as clinicians. In the words of Professor R.E. Steiner, this volume is intended to present the reader with some important and significant advances in the field of radiological research related to renal disease ..... It must be apparent to the reader, having had the opportunity to absorb the contributions in this volume, that radiology is no longer just a simple diagnostic technique;.....the specialty has developed into a very powerful tool which can be employed fruitfully and successfully for research purposes, both on a clinical and fundamental basis.

Future arrangements for The Medical Journal of Malaysia

WITH THE JUNE issue, (Vol. XXVII No. 4) the Journal will cease to be published by the Straits Times Press (S) Sendirian Berhad, 422 Thomson Road, Singapore 11. The Hon. Editor, Professor A.A. Sandosham, wishes to take this opportunity of recording his appreciation of the services rendered by the Straits Times Press, Singapore and the excellent standard it has maintained in printing and in bringing out the journal regularly over several years.

The Medical Journal of Malaysia, the official organ of the Malaysian Medical Association, will in future be published by the MMA and printed locally. All future correspondence in connection with this journal should be addressed to The Hon. Editor, Medical Journal of Malaysia, MMA House, 124 Jalan Pahang, Kuala Lumpur 02-14. (P.O. Box S-20, Sentul).

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