VOL. XXV NO. 2 DECEMBER 1970

The Medical Journal of Malaya

CONTENTS

Edited by Prof. A.A. Sandosham, Institute for Medical Research, Kuala Lumpur. Published by Straits Times Press (S) Sendirian Berhad, 422, Thomson Road, Singapore 11 and Printed by Times Printers Sendirian Berhad, 422, Thomson Road, Singapore 11.

Editorial

The Paediatric challenge

by S.C.E. Abraham

ONE OF THE QUESTIONS often put to the medical world today is: "What is the role of the Paediatrician in the context of modern social and economic development?" In the case of Malaysia, this role is dependent on the fact that more than 60 per cent of the population is well under 15 years of age while nearly 70 per cent of this population live in rural Malaysia.

In most urban areas, the doctor-child ratio is comparable with any developed country, while in the rural areas this ratio is deplorable, and in most cases, children have to be content with a diagnosis from a non-medical expert. The bulk of paediatric problems are tackled by general practitioners in private practice and the specialist paediatric services are only extended to the complicated cases which need further investigation.

There should be no doubt in the minds of child health workers that there should be a deliberate attempt to move out of the hospital into the fields of preventive paediatrics. We have to identify ourselves with the massive rural health programme now going on in Malaysia. In fact, health education for mothers could be more effective in a children's ward as mothers are in a more receptive mood, when their children are ill.

In the field of family planning, our participation in motivating parents cannot be given lesser importance. It is true that the paediatrician is more directly concerned with the health of the child, and he should realise that this is dependent on proper sibling spacing and limitation of family size. The mother can also be easily convinced of the ease and convenience in caring for an older infant or toddler unencumbered with a newborn which follows too soon after the preceding child, and the advantages which proper spacing brings her towards health and wellbeing.

Modern paediatrics today includes specialities in Neonatology, Neurology, Cardiology, Nephrology, etc., and one learns more and more about less and less. The dilemma is whether one can afford such specialisation now, when the basic needs for child health and care demands a higher priority in national health planning.

Yet the highest mortality is in the pre-school child.

In many instances, the child is not seen by a doctor, till he enters schoolgoing age. Problems of malnutrition, vision, hearing, brain damage and congenital abnormalities are often not detected early enough and this delay in detection makes treatment and rehabilitation difficult.

In the field of postgraduate studies in Paediatrics, the recent establishment in Singapore of the Master of Medicine (M. Med., Paed.) in Paediatrics is consistent with the emphasis on regional problems in child health. The training here is confined to the common paediatric problems in the region and in terms of economic savings, the chances of MORE local doctors obtaining this higher qualification are far better than the occasional one who goes abroad for higher studies.

In the final assessment, the challenge and needs are obvious, but a greater effort should be made to provide more opportunities for paediatricians to retain them in Government service. Many have returned with higher qualifications, equipped to contribute to child health programmes but have been disillusioned by lack of opportunities and sheer frustration and attracted to the private sector.

An outline of the medical services in Malaysia

by Keshmahinder Singh

(A paper read at the 5th Council Meeting of the Commonwealth Medical Association in Kuala Lumpur)

IN AUGUST 1957, MALAYA achieved independence and in August, 1963 Singapore, Sarawak and Sabah (British North Borneo) joined the States of Malaya to form Malaysia. In August 1965, Singapore left this union to become an independent state and the states comprising Malaya are now known as West Malaysia and the states of Sarawak and Sabah are known as East Malaysia. Health in West Malaysia is a federal matter placed under the responsibility of a Health Minister, while in East Malaysia, it is still a state responsibility and will become a federal matter in one years's time. This short paper refers mainly to the medical services in West Malaysia.

The nation's development has been framed in the three five-year development plans, i.e., 1st Malaya Plan, covering the period 1956-1960; the 2nd Malaya Plan 1961-1965; the 1st Malaysia Plan 1966-1970. The country's medical and health services have enjoyed expansion in these development plans.

In 1957, when Malaya attained independence, it inherited from the colonial powers a modest medical and health service. This consisted of eight general hospitals in the 11 states comprising Malaya and which served the major urban areas. The smaller towns were served by district hospitals staffed by one or two medical officers and these numbered 61. Most of the general hospitals (except Penang, Malacca and Johore Bahru) and all the district hospitals were old semi-permanent buildings.

The doctor-population ratio was 1:8,300 of population with uneven distribution. The country had no medical school and had to rely on Singapore and overseas medical schools for its doctors. It had a total of 45 specialists, the majority of whom were expatriates and the total number of doctors was 856, with 401 in government. There was also a modest dental service with 70 Division 1 dental surgeons and an elementary pharmaceutical service, with 1-2 pharmacists per state to run the service. There were 152 fixed dispensaries, 90 travelling dispensaries and a number of scattered maternity and child welfare clinics as well as an Institute for Medical Research in Kuala Lumpur which also provided the pathological and bacteriological services of the country.

During the First Malaya Plan (1956-1960), little more was done than to train Malaysians to take over the administrative and specialist posts to be vacated by expatriate doctors under the Malayanisation Scheme.

In 1961, the government embarked on the Second Malaya Five-Year Plan (1961-1965). The plan allocated $145 million for the development of medical and health services as against an expenditure of $12.7 million between 1956-1960. The aims of the plan were" . . . . for better medical and health services to the population to include a major expansion of the health services into the rural areas, the modernisation and expansion of hospital facilities, a more intensified campaign against tuberculosis, improvement of dental, psychiatric and leprosy services, and the establishment of a medical store and pharmaceutical laboratory . . . . "

By the time the Second Malaya Plan was completed, an estimated $102 million had been spent, representing 4.3% of total non-security development expenditure.

Under the First Malaysia Five-Year Plan (1966-1970), the allocation for Malaya in the field of health and medical services was increased to $150.4 million out of a total plan expenditure of $3,713.6 million.

In both plans, the emphasis has been on rural development and the rural medical and health services have been expanded to an important degree. These rural health services are based on the rural health unit system which provides a maternity clinic for every 2,000, one sub-health centre for every 10,000 and one main health centre for every 50,000 of the population to provide curative and preventive services to the rural population. By the end of 1970, there will be 45 main health centres, 188 health sub-centres, and 1,050 midwife clinics cum quarters. This has resulted in considerable improvement in the rural health services with reduction in the infant mortality rate from 70 to 45. The staffing of these centres may be said to be very satisfactory and they provide maternity care, child health services, nutrition and health education programmes, control of communicable diseases, family planning advice, etc.

Improvements have also been made towards the training of medical and para-medical personnel. The Faculty of Medicine took in its first batch of students in 1963 and the University Hospital was completed in 1968. This national medical school produced its first batch of graduates in 1969 and is geared to produce 100-120 graduates a year from 1972. In order to train the country's para-medical staff, other training schools have been started, e.g. four schools for nurses, training schools for assistant nurses, public health inspectors, dispensers, laboratory assistants, hospital assistants, midwives, dental nurses and radiographers.

The hospital services have been improved with new buildings for the general hospitals in Kuala Lumpur and Seremban and improvements to other hospital buildings. The bed strength has been increased from 20,337 in 1957 to 27,226 in 1969 (inclusive of beds in special institutions). This increase has not kept pace with the increase in population and the bed 1,000 population ratio has dropped from 2.09 beds in 1955 to 1.76 beds in 1970. Specialist services have been increased and from about 45 specialists in 1957 (majority expatriates) there are now more than 120 specialists with recognised post-graduate qualifications obtained overseas.

Improvements have also been made to other specialised medical services, such as psychiatric services and mental hospitals, leprosy services, laboratory services, medical research, dental services, etc. Control programmes are in force, e.g., tuberculosis control, and these are in various stages of achieving their objectives. The greatest stress has been on tuberculosis control and malaria eradication.

There has also been a considerable improvement in the medical and health services in the private sector. There are at present 2,150 registered medical practitioners in the country and more than 2/3 of these are in private practice. This gives a ratio of doctors to population of 1:4,500 though the distribution is uneven – Selangor has the largest number of doctors, with a ratio of 1:1,947 and Kelantan the lowest with 1:17,704. Many smaller towns which never had the services of a doctor now have this service though practitioners prefer the larger towns. There has been a trend for those practising a speciality to leave Government and set up private specialist practice and the larger towns now have such specialists. This has encouraged the establishment of private nursing homes, and in the larger towns of Kuala Lumpur, Ipoh and Penang, there are private hospitals of high standards. The private sector therefore contributes very largely to the medical needs of the urban population and also to a fair degree that of the rural population.

Estates and mines provide medical facilities, including hospital care, for their employees. These estate hospitals generally provide elementary nursing and medical care with resident hospital assistants and midwives who work under the supervision of visiting medical officers.

Most commercial and manufacturing establishments and almost all the larger establishments provide medical benefits at the company's expense. Private practitioners are contracted to meet the medical (mainly curative) needs of the employees. Hospitalisation expenses are paid often in the case of senior employees, but the junior employees and the non-executive or labour force generally are referred to government hospitals for institutional medical care.

FUTURE DEVELOPMENT

During the ten years 1961-1970, the nation has developed in all fields. The nation has enjoyed economic prosperity and has had an average rate of growth of 6% per annum. Today, the per capita income in Malaysia is $1,000/= (U.S. $330/=) a level which is high in Asia though well below that in a developed country. There has been an increase in the population from 7.0 million in 1960 to 10.5 million in 1969, with 60% of the population under 21 years. While significant developments have taken place since

1957, and the progress achieved is very commendable, there is yet need for even more and greater effort in further improving the medical and health services of Malaysia.

Given the financial constraints facing the federal government, and the need to allocate resources to economic development, especially with our rapidly rising young population, the health programmes under the Second Malaysia Plan cannot afford to be on a grand scale.

The rural health services have, rightly so, been greatly expanded in the last two 5-year development plans. These rural health services, in the Second Malaysia Plan, will have to be consolidated, any deficiencies rectified and environmental sanitation and family planning intensified. Health education and other programmes will have to be carrried out.

It is suggested that because of the difficulties in getting private practitioners to the rural areas, government could set up schemes to encourage private practice in rural areas by granting capital medium term loans at fair interest rates to those wishing to set up rural medical practices and offer part-time hospital appointments in areas where the population isn't large enough to support a private medical practitioner.

The hospital services need to be improved in almost all states. There is a need to replace the present semi-permanent out-dated buildings by more modern and practical ones, in addition to a substantial increase in the number of hospital beds. Over the past ten years, the ratio of hospital beds per 1,000 of population has fallen and there is a great need in the Second Malaysia Plan to rectify this deteriorating position.

Better and modern equipment is needed and the pathological laboratory services should be developed. All general hospitals should have the services of a resident pathologist with pathological and bacteriological laboratories. The mental health services, too, should be expanded to provide for a psychiatrist in all general hospitals by the end of the next five years.

Library services should be provided for all hospitals, the general hospitals having a fairly comprehensive medical library and the district hospitals with smaller libraries of standard medical textbooks.

Establishing Institutes of Medicine in the different branches of medicine for the purpose of providing curative services, training facilities for post-graduate education and research.

(a) Institute for Medical Research, which was established in 1900, has contributed a great deal to the country in terms of research into tropical diseases and providing pathological and bacteriological services.

(b) Institute of Public Health was established during the First Malaysia Plan and is contributing greatly to the health needs of the country.

(c) Institute of Neurological Sciences named after our Prime Minister, is being built and staff for it being trained at present, and forms part of the General Hospital complex in Kuala Lumpur.

(d) The nation should be able to go further and develop the following four institutes in the Second Malaysia Plan. Public participation could be invited in the development of these institutes, not only with financial contributions but also public participation in management. Specialists in private practice, in government service and the university must serve on the staff of these institutes and it is strongly felt the staffing of these institutes should not be a narrow policy of only having full-time government officers.

(i) Institute of Tropical Medicine
(ii) Institute for Chest Diseases
(iii) Institute of Orthopaedics
(iv) Institute of Ophthalmology

Under the First Malaysia Plan, government accepted the need for voluntary family planning. To this end, the National Family Planning Board was established in 1966 though prior to this, a lot of active work was done by the Family Planning Association, a voluntary organisation. To reduce our high birthrate, expansion of these services is necessary to provide both education and birth control facilities throughout the country in a most aggressive manner.

The Faculty of Medicine, University of Malaya is geared to produce 100-120 graduates from 1972. It is estimated that there will be an equal number of Malaysians graduating from overseas medical schools, especially Singapore, Australia, India and Taiwan. A Faculty of Dentistry is being set up in 1970 and a Faculty of Pharmacy is also believed to be in the pipeline. There is talk of a second medical school, perhaps as part of the University in Penang but this may not be achieved in the Second Malaysia Plan.

During this period, the medical profession should crystallise its thoughts on post-graduate medical education and should begin at least to organise proper training courses of lecture-demonstrations in pre-

paring for post-graduate qualifications.

With the reduction in the strength of the Commonwealth Armed Forces stationed in this country over the past two years and this reduction likely to continue, government has to increase the country's armed forces. This will entail a larger establishment for the medical arm of the armed forces, including specialists. The taking-over of the military hospitals at Kinrara and Terendak will mean that military medicine will have to be placed on a firmer footing.

Social Security: In 1969, the Government of Malaysia passed the Social Security Act though this has yet to be enforced. This act essentially replaces the old Workmen's Compensation Ordinance and provides workers with an

(a) Invalidity pension scheme
(b) Employment injury scheme

Rules and regulations are being drafted at present and the Minister of Labour may bring this act into force within the next year. No form of health insurance exists and as far as one can see none is contemplated in the near future.

Our administrators, medical and general service, have continued to develop the medical services along the established colonial lines which completely divide the service into two, i.e., a service provided by government with full-time doctors and staff, and the private medical practitioners who have no connection with government institutions. The government argues that a patient can go to a government outpatient department for treatment of his illness and will be seen and treated, if necessary, by their best specialists, at no cost. While this may be true in theory, in practice there is a great deal of dissatisfaction among the general public.

The Malayan Medical Association feels that Malaysia, since independence, has done well in its development plans and has now reached a stage where it should seriously study the different forms of health and medical services provided in the more developed countries, with a view to integrating our medical services (government and private), introducing contributory health insurance schemes, etc. The Malayan Medical Association has requested government to set up a high-powered commission to receive evidence and make recommendations on the type of medical service this country should have in the future but this has so far not been accepted by government.

It is hoped, if not expected, that our Ministry of Health and the government's administrators and economic advisers will give serious thought to consider changes from the present pattern of our "colonial" medical service towards patterns in developed countries and provide better medical services to the people of this country.

Radioisotope colour scanning of the liver in the diagnosis of liver disease

by
S.K. Dharmalingam
Sr. Consultant Radiotherapist and
Head of Dept. of Radiotherapy and Nuclear Medicine,
General Hospital,
Kuala Lumpur.

and
V. Mahadev
Physician in Charge Radioisotopes,
Dept. of Radiotherapy and Nuclear Medicine,
General Hospital,
Kuala Lumpur.

INTRODUCTION

SINCE THE INTRODUCTION of Scintillation Scanning of the liver by Stirret and his co-workers in 1953, there have been numerous reports of the uses of this new technique in investigating liver diseases. Stirret had originally used RHISA labelled with 1131 and showed that there was increased uptake over space-occupying lesions of the liver. Modern techniques involve the use of two groups of radiopharmaceuticals in both of which the lesions appear as cold areas. Stirret's original technique, using RHISA, has been given up but it is, of course, attractive in its positive rather than negative approach to the detection of liver abnormalities. However, the use of Molybdenum 99 (Sorensen 1963) is a return to this approach.

131 I Rose Bengal introduced by Friedel 1957 belongs to the group which depends on concentration and excretion by the hepatic cells. Its advantage is that the biliary excretion is monitored, and this enables detection of obstructive lesions of the biliary passages. However, the heavy concentration in the gall bladder of the agent and the rapid changes in the liver concentration make scanning difficult.

The second group of radiopharmaceuticals used in the investigation of liver conditions are the colloidal agents – 198 Au, 99m Tc – S Colloid, Albumin labelled with 1^{131} and lately Indium 113m, introduced by Goodwin in 1966.

The colloidal agents depend on the uptake by the Kupffer cells and are not excreted via the biliary passages. 99m Tc – S colloid is, perhaps, one of the best agents available today because of its favourable low energy gamma emission which enables favourable scanning and also because of its low radiation burden on the liver due to its short half-life of six hours.

In this series, 198 Au Colloid was used for scanning because of its easy availability and cheapness. The colour scanning technique first introduced by Mallard and Peachey in 1959 was used and it appears to have certain advantages over the photoscanning technique (Baum 1966). There have been several reviews of the place of liver scintillation scanning in diagnosis. Nagler, Blau and Bender reviewed 950 scans of patients with known cancer and compared the results with operation or autopsy findings. Positive scans were 83% correct and negative scans 88% correct. They had used 1^{131} Rose Bengal Gollins. Sima and Cameron (1964) found only three false positive scans among 129 abnormals they studied. Baum (1967) used the colour scanning technique in detecting hepatic metastases and concluded that the scan was more accurate than conventional tests in excluding liver metastases, only one false negative in 70 scans.

INDICATIONS FOR LIVER SCAN

1. Abdominal mass – enlarged liver.
2. Obstructive jaundice.
3. Detection of secondaries.
4. Assessing operability of primary hepatoma.
5. Cirrhosis of liver.
6. Regeneration of liver.
7. Trauma.
8. Response to therapy.
9. Amoebiasis, hydatidcysts.
10. Children-malrotation and other abnormalities of GI tract. Congenital heart disease situs inversus.

During the past nine months in which we acquired a scanner in this department, 91 patients were scanned for suspected liver diseases. The scan findings were correlated with clinical, biochemical, conventional radiological, operative and biopsy findings. In all, 55 had definite findings, at surgery, biopsy or autopsy and an attempt was made to classify the scan findings in each condition.

METHOD AND MATERIALS

Without previous preparation, each patient received 150 microcuries of Colloidal Au 198, I/V. Liver scans were done one hour after this. The scanner used had a 5-inch Th-activated Sodium iodide crystal, a coarse focusing collimator was used, placing the probe 1 cm from the skin surface. The colour calibration was adjusted so that the area of maximum activity produced a red colour on the scan. Other factors such as speed, spacing, tapping factor, and time constant were varied according to the maximum count rate. The scan speed varied from 48 to 72 cm/min. All patients were scanned in the supine position and, in addition, a lateral scan was done when indicated. After completion, the xiphisternum, costal cartilages, liver edge, spleen and other palpable masses were marked on the scan. The procedure took one hour in all. All scans were interpreted prior to the establishment of a diagnosis and a report given.

DETAILS OF SCAN REVIEW

Hepatoma	17
Secondaries	15
Cirrhosis	9
Abscess	16
Regenerative studies	7
Obstructive jaundice	6
Normal scans	11
Polycystic disease	1
Reticulosis	1
Total done	91
Number verified PM, Biopsy, OP	55
Diagnosis wrong	4
False positive	2

RESULTS

55 of the 91 patients scanned had operations or biopsy or both in most. There were only 11 normal scans and all the rest were reported as abnormal. Diagnostic accuracy of the scan – all 11 normal scans were subsequently confirmed – clinically six and biopsy and operation five.

Of the remaining 80 cases, the diagnosis was wrong in four. As will be explained in the discussion, in all these four instances, there was indeed a space-occupying lesion at surgery but where an abscess was diagnosed in one case, a large hepatoma was found at surgery. In another instance, an abscess was detected at operation where the scan was interpreted as suggestive of hepatoma. The remaining two were cases where primary and secondary malignancy were confused. It is clear that although the scan may give clues as to the nature of the lesion, it does not warrant a pathological diagnosis. False positives were seen in two cases. One of these was a patient with cirrhosis; this will be discussed below. An accuracy of 85% in this group is similar to those reported by others (Nagler et al, Gollins et al).

Correlation with other tests

In all cases, a clinical examination, liver function tests and routine X-rays were done. Only 40% of cases with metastases had an elevated alkaline phosphatase. This contrasts sharply with recent studies (Smith & Williams 1968). The latter concluded that the alkaline phosphatase predicts a space-occupying lesion better than the scan in a study involving 296 patients. However, Baum (1967) had a similar finding (38% with raised alkaline phosphatase in liver metastases). The majority of cases detected of primary hepatomas were fairly advanced and clinically obvious but a few were detected only because of the scan. Further, cases of abdominal masses were correctly diagnosed as extra hepatic purely on the basis of the scan.

CIRRHOSIS

SCAN IN CIRRHOSIS

Total number done	9
History of alcoholism	2
Abnormal LFT	A11
Raised – enzymes (done in 5 cases)	3

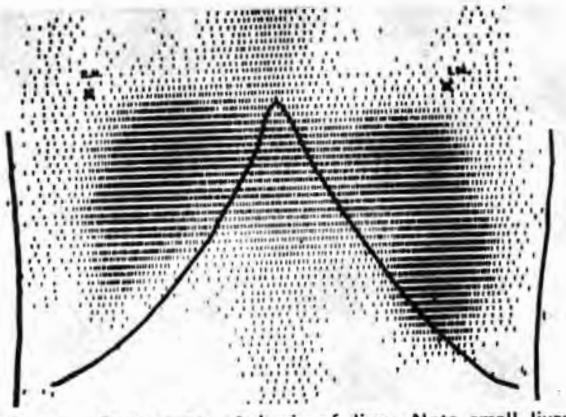


Fig. 1: Cryptogenic cirrhosis of liver. Note small liver, irregular activity over the liver, splenomegaly and marrow uptake.

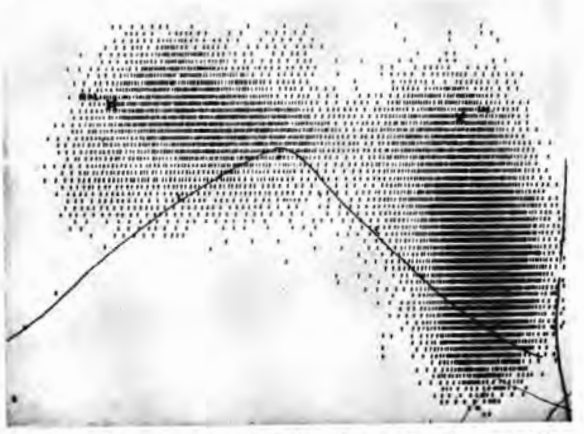


Fig. 2: Cryptogenic cirrhosis with portal hypertension. Marked reduction in liver activity.

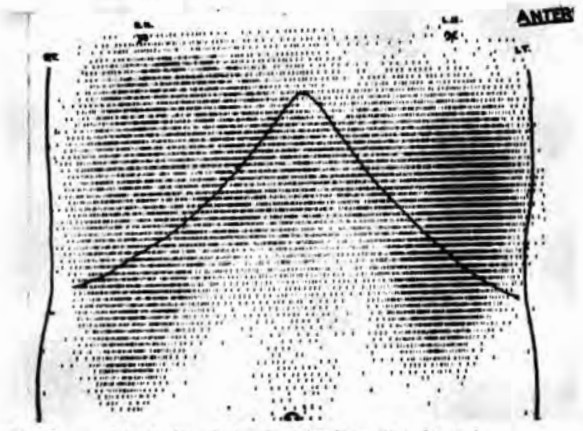


Fig. 3: Alcoholic cirrhosis. The liver is enlarged.

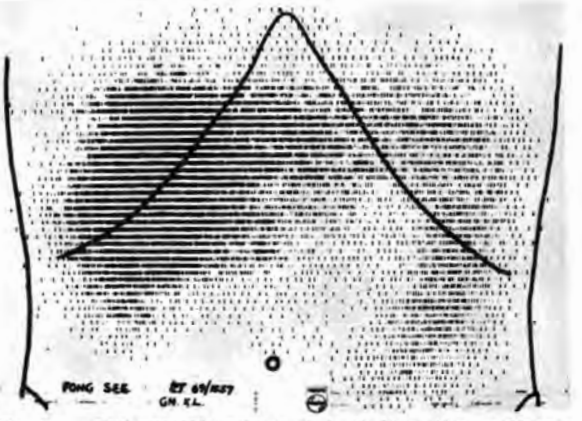


Fig. 4: Solitary cold area in cirrhotic liver. Non-malignant on biopsy. This is an example of false + ive finding in cirrhosis.

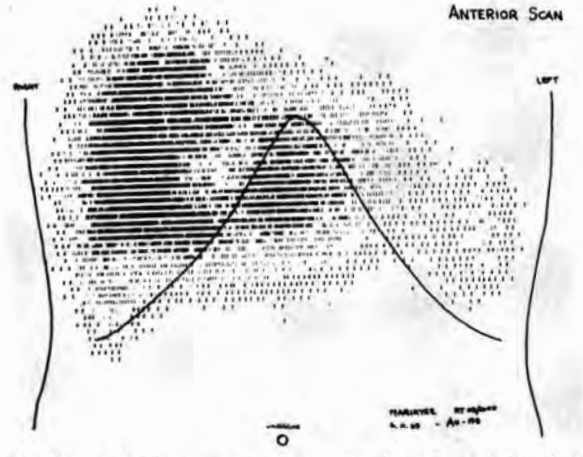


Fig. 5: Positive scan in obstructive jaundice. Patient had persistent jaundice following cholecystectomy. Final diagnosis – primary hepatoma.

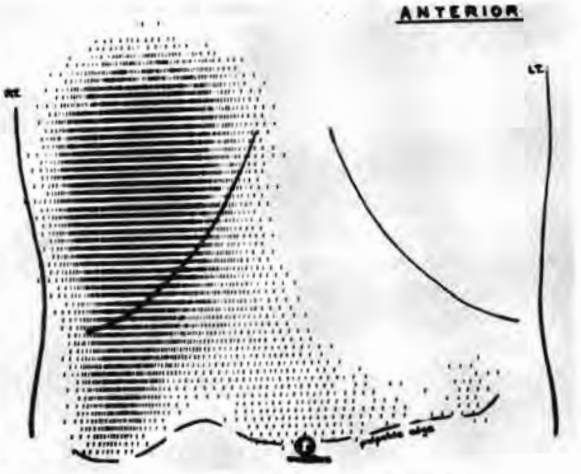


Fig. 6: Amoebic abscess of left lobe of the liver.

SCAN FINDINGS

	Non-Alcoholic	Alcoholic
Size of liver	Small 4 Enlarged 1	Enlarged 2
Left lobe	Enlarged 4	Normal
Spleen enlarged	6 cases	2 cases
Diffuse changes including mottling	7 cases	2 cases
Marrow uptake	5 cases	2 cases
Cold areas	None	1 case

There were nine cases of cirrhosis; 3 cases showed an enlarged liver in the scan, one showed a normal liver, and the remainder all had grossly reduced liver outlines. The size of the liver was related to the history of alcoholism. In all three, the liver was not palpable clinically. (McAfee et al 1965 – liver enlargement in the majority of their cirrhotics).

There was splenomegaly in eight cases, and in all the nine cases, a patchy activity in the scan was noted. There appeared to be no correlation between the liver function tests and severity of these findings. Focal change, suggestive of a space-occupying lesion, was seen and reported in one case which at operation was not confirmed.

PRIMARY HEPATOMA

SCAN IN PRIMARY HEPATOMA

Total number done	17 cases
Number with hepatomegaly	17 cases
Number with abnormal liver function tests	14 cases
Scan Findings	
Liver enlargement	15 cases
Liver edge does not correspond to scan margin	8 cases
Cold lesions	All 17 cases
Diffuse changes	7 cases
Splenomegaly	3 cases

All the 17 cases scanned showed gross hepatomegaly. Often the enlargement involved the unaffected part of the liver. A striking finding was the disparity between the liver scan edge and the palpable liver edge. It is quite clear that hepatic metastases can produce a scan appearance of large SOL exactly like a hepatoma. One case was missed at peritoneoscopy, and here the scan showed a large cold zone occupying the posterior part of the liver, only seen in the lateral view. 90% of hepatomas at operation proved to have co-existent cirrhosis. However, it was not easy to detect the diffuse changes seen in cirrhosis in the scan – this might be one means of distinguishing hepatomas from other SOL of the liver, like abscesses. Splenomegaly was seen in only three of these 17 scans. One of the cases with splenomegaly, and diffuse changes suggestive of cirrhosis in the presence of a large SOL was reported as a hepatoma on this reasoning but it turned out to be an abscess at surgery.

AMOEBIC ABSCESS

SCAN IN AMOEBIC ABSCESS OF LIVER

Total number of cases scanned		16
Hepatomegaly		12
Cold Areas:	Solitary	10
	Multiple	1
	Involving whole lobe	2
Diffuse changes		1
Normal scan		1
Hilar cold area		1

Sixteen cases of amoebic abscesses were scanned. Definite cold areas corresponding to the lesions were identified in ten of them. All ten were confirmed at surgery. In one case, there were two abscesses in the scan although only one was identified at surgery. It is possible the cold area is merely an area of necrosis or fatty change. There was marked hepatomegaly in all ten, and involved both lobes. A normal scan was seen in two cases clinically diagnosed and treated as amoebic hepatitis. Diffuse changes in the liver scan, such as in cirrhosis, was seen in only one case. The unaffected areas of the liver showed very uniform appearance in the scan. This makes us feel that the disease occurs in an essentially normal liver and is a localised suppurative process. Further studies are being carried out to test this theory.

The majority of cases had an alcoholic history. Normal scans were seen in two cases and hepatomegaly without focal change in two others; these four cases might constitute the group of so-called amoebic hepatitis. However, small focal lesions less than 2 cms. in diameter could be missed in the scan. Multiple views might have helped to locate them.

The problem of cold areas in the hilar region in liver scans of patients with obstructive jaundice has been well described by Morris, McRae et al (1965). In six cases of obstructive jaundice scanned, the diagnosis was fairly clear from the scan appearances. In three of the cases, there were extensive cold areas near the hilar area also extending into the rest of the lobe. All three were found at surgery to be primary hepatoma involving the hilar region and bile ducts. In one case, there were minimal changes in the hilar area associated with diffuse changes over the rest of the liver. This case was diagnosed correctly as diffuse

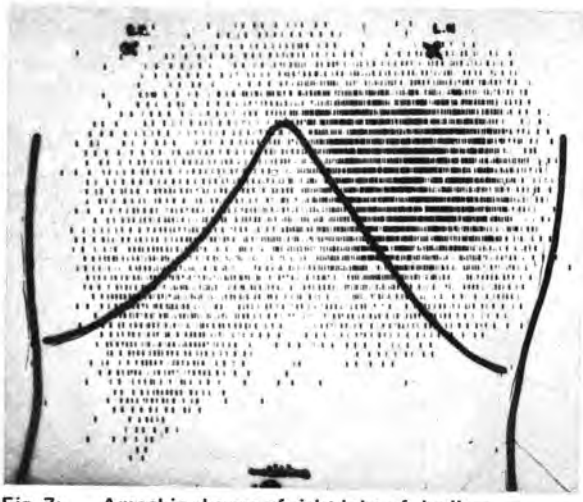


Fig. 7: Amoebic abscess of right lobe of the liver.

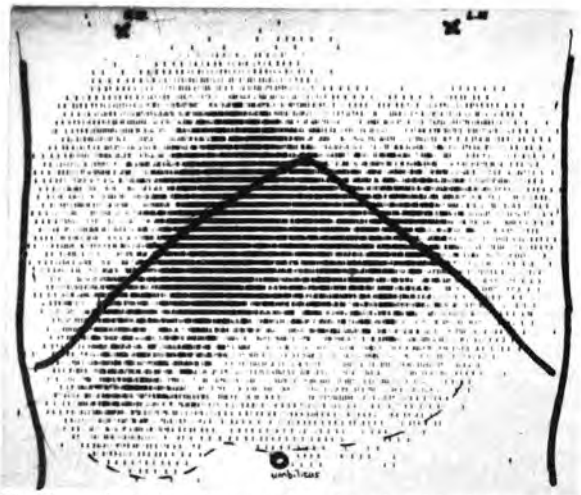


Fig. 8: Amoebic abscess situated in the right lobe laterally. Scan suggests diffuse involvement of the liver as well. This is usual.

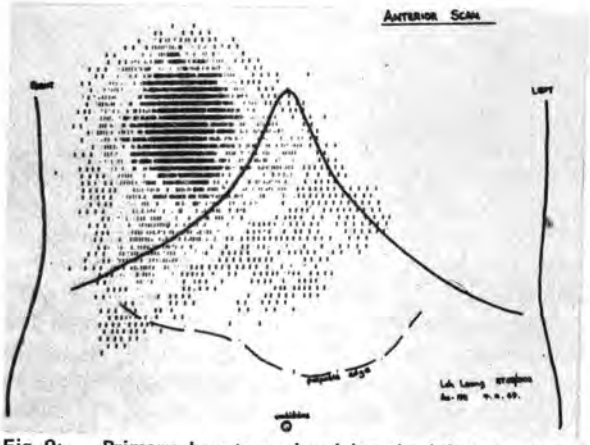


Fig. 9: Primary hepatoma involving the left lobe of the liver. Note disparity between scan edge and palpable edge of the liver.

Fig. 10. Primary hepatoma involving the right lobe of the liver.

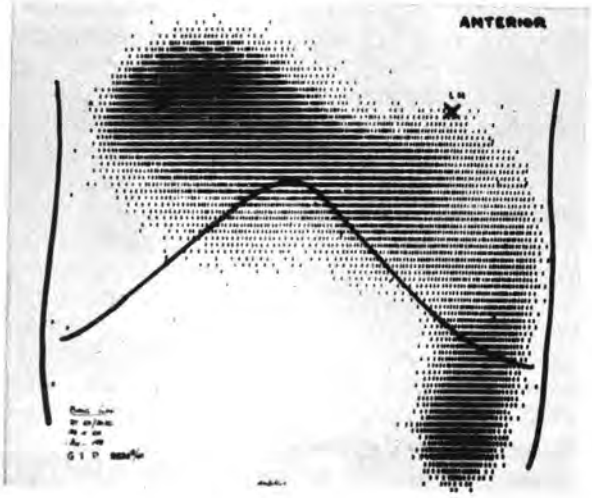


Fig. 11: Primary hepatoma involving the right lobe of the liver arising in a cirrhotic liver. Note splenomegaly. This is a common association.

OBSTRUCTIVE JAUNDICE

DETAILS OF PATIENTS SCANNED FOR OBSTRUCTIVE JAUNDICE

		Case					
Total number done	6 cases	1	2	3	4	5	6
Clinical features	Hepatomegaly	–	–	–	+	+	+
	Splenomegaly	–	–	–	–	–	–
	Duration of jaundice	2M	2Wk	1M	2M	1M	3M
Scan features	Hepatomegaly	+	+	+	+	+	+
	Solitary cold area	–	–	+	+	+	+
	Multiple cold areas	+	–	–	–	–	–
	Splenic uptake	–	–	–	–	–	–
	Hilar cold area	+	+	+	–	–	–
	Diffuse changes	–	+	–	–	–	–
Final diagnosis	Secondaries in liver	+	–	–	–	–	–
	Primary hepatoma	–	–	+	+	+	–
	Diffuse hepatitis	–	+	–	–	–	–*

*Case 6: diagnosis not known even after laparatomy

hepatic disease – hepatitis – and was confirmed. In one patient, the operation finding did not reveal a cause for the obstructive jaundice. The scan revealed a prominent cold area near the hilum extending into the centre of the liver. This has now been confirmed to be a carcinoma on follow-up.

HEPATIC METASTASES

As already mentioned, 15 patients were correctly diagnosed on scan appearances as having metastases. The diagnosis were often made in the presence of normal liver function tests, and in a few, in the absence of liver enlargement. Scan findings were usually quite characteristic with multiple cold areas in the liver; however, cases of multicentric hepatoma gave the same picture. Also, large cold areas in the liver similar to findings in hepatoma were seen in secondaries in one case.

DISCUSSION

It is obvious there is much to be achieved in diagnostic accuracy in scintillation scanning of the liver. The scan is fairly reliable in diagnosing the presence or absence of space-occupying lesions of the liver, in detecting the size and shape of the liver, in diagnosing displacement of the liver, and in detecting diffuse hepatic diseases. However, it does not give a pathological diagnosis. Krael, Jones et al have compared scintillation scanning of the liver with hepatic arteriography and have concluded that both methods can detect space-occupying lesions of the liver but the angiographic technique is able to distinguish malignant tumours from cysts and demonstrate lesions less than 2 cms.

Both procedures can give false positives and the value of each is enhanced by doing both. A space-occupying lesion less than 2 cms. is unlikely to give rise to much by way of symptoms and in clinical practice, by the time a patient has symptoms, space-occupying lesions, such as hepatomas, are easily demonstrable on the scan. As far as conventional tests, such as alkaline phosphatase, to detect space-occupying lesions are concerned, it must be pointed out that these are not comparable. It has never been proved that hepatic metastases, for example, produce excessive alkaline phosphatase. In some reports, the alkaline phosphatase has been shown to be elevated early but in this series, 40% of metastases occurred in the presence of an elevated alkaline phosphatase.

It is interesting to consider the findings in cirrhosis. Much of the patchy activity and false positives seen are due to poor statistics as a result of low activity in the liver. Klion, Nagler, Bender et al have shown that false positive scans are common. The Kupffer cells, which are responsible for the uptake of colloidal agents that are used, actually increased instead of being decreased in cirrhosis. Further, the actual amount of colloid used is 2500 times less than

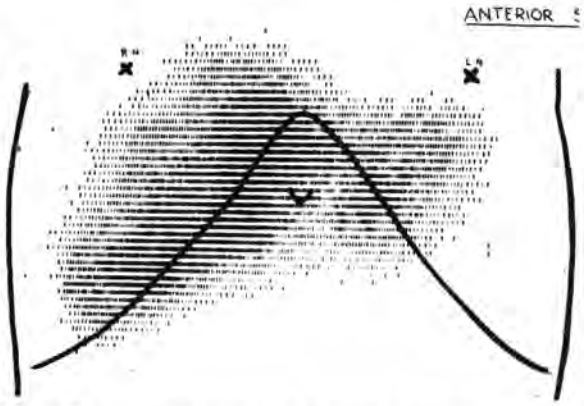


Fig. 12: Scan of a patient with primary hepatoma.

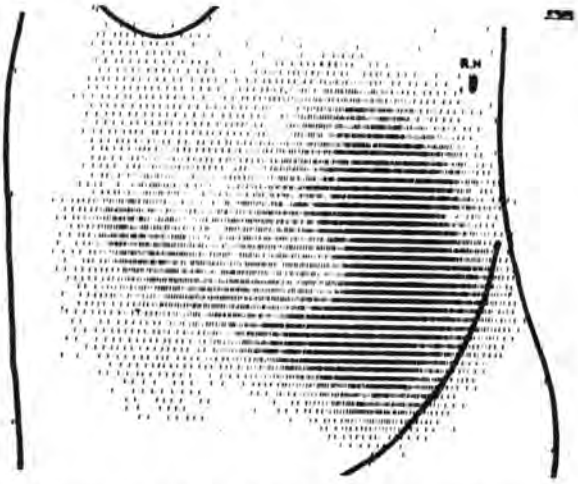


Fig. 13: Lateral view in the above patient clearly localises the growth posteriorly and superiorly – importance of lateral views.

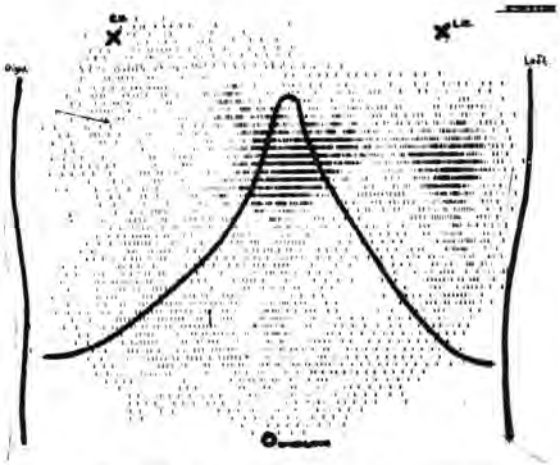


Fig. 14: Secondaries in the liver from a nasopharyngeal carcinoma. Note picture of multiple cold areas.

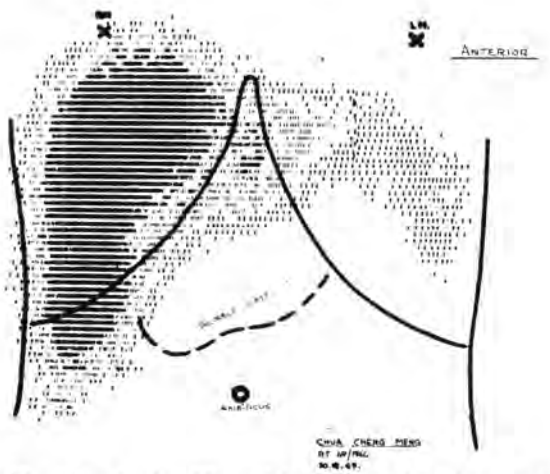


Fig. 15: Scan in the differential diagnosis of an abdominal mass. Lesion here is a carcinoma of the stomach and the scan clearly shows that it is extra-hepatic.

the liver's capacity. So it is quite clear that the poor hepatic uptake in cirrhosis is due to other factors such as blood supply. This explains the absence of a clear correlation between liver function tests and the scan appearance.

Better counting statistics, using newer radiopharmaceuticals, better instrumentation, use of blood pool studies, etc., may lead to a clearer evaluation of the problem of cirrhosis. It is difficult to ignore a positive scan in a cirrhotic in view of the incidence of primary hepatoma in relation to cirrhotic livers.

CONCLUSION

1. 91 Liver scans done in the department were reviewed.
2. All except 11 showed abnormalities.
3. A diagnostic accuracy of over 85% was obtained.
4. The scan in the investigation of hepatoma, cirrhosis, abscesses, secondaries in the liver, and in obstructive jaundice was shown to be helpful. The scan often supplied information not available by any other conventional investigations.
5. A general review of the developments in scintil-

lation scanning of the liver and some of the pitfalls of the method is discussed.

This work would not be possible but for interest in this new investigation by the surgeons and physicians of this hospital, especially Mr. M. Balasegaram, F.R.C.S. Our thanks to the isotope technician, Mr. Anthony Ng and Mr. Henry Apoo for his help in secretarial work.

REFERENCES

Baum, S., Silver, C., *J.A.M.A.*, 197, 675, 1966.
Brown, D.W., *J.A.M.A.*, 197, 728, 1966.
Cohen, M.B., and Blahd, H., *Gastroenterology*, 45, 621, 1963.
Czerniak, P., Lubin, E., Djaldetti, M., and DeVries, A., *J. Nucl. Med.*, 2, 121, 1961.
Gollin, F.F., Sims, L.R., Cameron, J.R., *J.A.M.A.*, 187, 111, 1964.
Gottschalk, A., *J.A.M.A.*, 200, 630, 1967.
Harper, P.V., Lathrop, K.A., and Richards, P., *J. Nucl. Med.*, 5, 382, 1964.
Johnson, P.M., and Sweeney, W.A., *J. Nucl. Med.*, 7, 375, 1966.
Kreel, L., Jones, E.A., Tavil, A.S., *Brit. J. Radiology*, 41, 486, 1968.
Leevy, C.M., and Greenberg, J., *Am., J. Med. Sci.*, 233, 28, 1957.
Little, J.M., McRae, J., Smitananda, N., and Morris, J.G., *Surg. Synec. & Obstet.*, 125, 725, 1967.
Lum, C.H., Marshall, J., Kozoll, D.D., and Meyer, K.A., *Ann. Surg.*, 149, 353, 1959. Marberg, K., and Czerniak, P., *Annals of Int. Med.*, 60, 66, 1964.
McAfee, J.G., Ause, R.G., and Wagner, H.N., Jr., *Arch. Int. Med.*, 16, 95, 1965.
Nordyke, R.A., *J.A.M.A.*, 194, 949, 1965.
Rozental, P. Biller, E.B., and Kaplan, E., *J. Nucl. Med.*, 7, 868, 1966.
Ruskin, R., and Saengar, E.L., *Radiology*, 81, 980, 1963.
Stirret, L.A., Yuhl, E.T., and Libby, R.L., *Radiology*, 61, 930, 1953.
Yuhl, E.T., and Stirret, L.A., *Ann. Surg.*, 138, 857, 1953.

Psychocutaneous disorders

by Tay Chong Hai
AM, MBBS, MRCP (G)
Medical Unit II,
Outram Road General Hospital,
Singapore 3.

(Paper read at the meeting of the Malaysian Medical Association, Southern branch, at the General Hospital, Johore Bahru, on June 21, 1970.)

INTRODUCTION

THE ROLE OF psychological factors in the aetiology of skin disease has recently received increasing emphasis. It has been estimated that 45% to 78% of patients attending the dermatological clinics have emotional problems and some degree of psychosomatic or somatopsychic involvement. (Hallsmith & Norton, 1952; Rubin, 1966; Rostenberg, 1960).

However, only in very few cutaneous conditions do emotion play the primary and essential pathogenic role. At times, it is often difficult to determine whether the emotional distress causes the skin disease or the skin disease causes the emotional disturbance.

Numerous contributions on psychocutaneous diseases have been published (Halliday, 1944; Wilson & Miller, 1946; Cormis, 1947, 1951; Klauder, 1936; Brunner, 1948; English, 1949; Zaidens, 1951; Slorach, 1953; Wittkower & Russel, 1953; Obermayer, 1955; Phillsbury et al., 1956; Rostenberg, 1960; Rubin, 1966) and various classifications have been proposed but none are generally considered as satisfactory.

In clinical practice, the classification proposed by Rook and Wilkinson (1968) has been found to be extremely useful (see table).

In this paper, four illustrative cases of dermatoses exclusively emotional in origin (Group 1) are described and discussed.

PSYCHOCUTANEOUS DISORDERS

(1) DERMATOSES EXCLUSIVELY EMOTIONAL IN ORIGIN Dermatitis artefacta Trichotillomania Delusional symptoms referred to the skin (e.g. delusion of parasitoses syphilophobia, etc) Cutaneous hypochondriasis

(2) DERMATOSES PARTLY OF OTHER ORIGIN AGGRAVATED OR PERPETUATED BY SELF-INFLICITED TRAUMA Lichen simplex, Acne necrotica, Acne excorie

(3) DERMATOSES FREQUENTLY PROVOKED OR PERPETUATED BY DEMONSTRABLE PSYCHOSOMATIC MECHANISMS Anogenital pruritus, Generalised pruritus, Hyperhidrosis
Blushing

(4) DERMATOSES IN WHICH IMPORTANT EMOTIONAL PREDISPOSING, PRECIPITATING OR PERTUATING FACTORS ARE FREQUENTLY IMPLICATED
Eczema
Pompholyx
Atopic dermatitis
Urticaria

Seborrhoeic dermatitis
Rosacea

(5) DERMATOSES SOMETIMES INFLUENCED BY EMOTIONAL FACTORS
Psoriasis
Lichen planus
Alopecia areata
Diffuse alopecia
Vitiligo
Aphthosis
Herpes simplex

This group of dermatoses is much more uncommon than other psychocutaneous disorders listed in Table 1, and their cutaneous manifestations often portend serious mental illness or organic psychosis. The difficulties encountered in the diagnosis and in the management of these cases will be presented.

ILLUSTRATION OF CASES

(1) Delusion of Parasitosis

For the past ten years, a 51-year-old Indian woman suffered from discoid psoriasis involving the scalp, arms, legs and trunk. There were periods of remission following topical applications of coal tar and steriod cream preparations.

Five years later, most of the skin lesions had disappeared, but a resistant psoriatic plaque, size 5" x 2½", remained over the right fronto-parietal region. It was pruritic and secondary alopecia was present over the plaque. (Figure 1). After some therapeutic trials with the various topical corticosteriods it was decided to treat the scalp lesion with intralesional triamcinolone (Kenacort) as the former treatment had failed. Dramatic clearing of the psoriatic lesion was observed after eight weekly intra-lesional steriod injections. Inspite of the objective improvement, her symptoms began to multiply every week. Numerous complaints, ranging from insomnia, palpitation, dizziness, aches and pains, loss of appetite, loss of weight, poor memory and many non-descriptive symptoms were the woeful story we heard on every visit. Most of these symptoms were attributed to the presence of the psoriatic scalp lesion. Thorough physical examinations and detailed laboratory investigations failed to find any systemic disorders. The treated fronto-parietal patch showed no psoriatic activity and normal histology was obtained with the scalp biopsy.

Soon afterwards, she began to complain bitterly of insects, especially ants, crawling all over her head and biting her scalp lesion. She was extremely upset, depressed and emotional. Her relatives observed that she spent most of her time washing and combing her hair, rubbing and scratching the bald patch over the scalp and spraying the room with DDT. All these efforts did not stop the "parasites" (ants) from invading her. Members of her family as well as the attending doctors could not find a single insect on her head or her body. When she noticed that we did not believe her story, she started to bring small paper packets of dead ants and other debris to convince us (Figure 2).

At this stage, her mental state had deteriorated so badly that the diagnosis of Delusion of Parasitosis was fairly evident.

According to the family, the patient had severe endogenous depression soon after her husband's

Fig. 1: Bald patch of treated psoriatic scalp lesion.

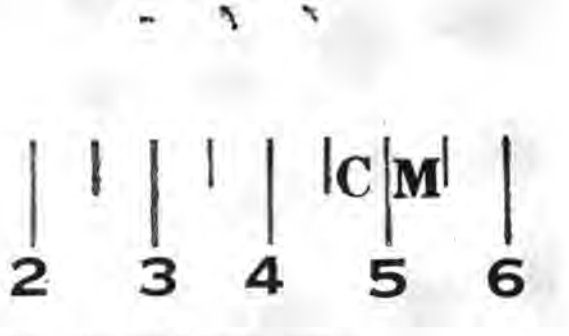


Fig. 2: Dead ants given as "evidence".

death five years ago. She had been receiving various medications from a number of private practitioners, but the psychiatric condition deteriorated further with the onset of menopause, the anxieties of the disfiguring scalp psoriasis, and lately, the effects of the intralesional steriod injections. At home, she was always miserable, non-communicative, weeping quietly and had various other delusions. Once, she was seen by relatives collecting "dead" ants from the floor of her house. These were the insects used as the "evidence."

The psychiatrist, whom she later saw, found that she had involutional depressive psychosis and advised institutional treatment but she refused. After over three years on regular psychotropic treatment as an outpatient, the cutaneous delusions seemed to have improved; however, her psoriasis had recently relapsed again.

Comment

Delusion of parasitosis or acarophobia refers to patients who are convinced that their skin is infested by parasites. Thus the deluded victim has the hallucination that he can see and feel the 'vermin' within his skin. The term "delusion" is a preferred designation for this disorder, as the word "acarophobia" is often misleading since these patients fear the parasites no more than the normal people. (Wilson & Miller, 1946; Wilson, 1952; Schurt & Waldron, 1963). From the psychiatric point of view and from the clinical presentation, there are two distinct groups of this disease:

(1) One group that affects older (over 40 years) females three times more than males and often associates with involutional depression, organic psychosis and obsessional personalities with hypochondriasis. (Aleshire, 1954; Tullett, 1965).
(2) Another group often presents in younger patients who have schizophrenia or toxic psychosis.

Our patient clearly had the delusional disorders of the first group and her "parasites" were ants, which she later produced as "evidence" after collecting them from the floor. The condition was complicated by the pre-existing psoriatic lesions and steriod therapy. It must be remembered that careful search for these "parasites" is warranted in every case. For one reason, the patient would lose faith if no concern is displayed by the attending doctor and proper investigation conducted. For another reason, the doctor may avoid the embarrassment that may ensue if it actually turned out that the patient is right. Such mistakes had happened before.

The psychosis in these patients was precipitated by a number of factors and her mental state was not seriously studied until the later stage of the disease. This illustrative case thus demonstrated that dermatology is not just skin deep, since the epidermis is but a part of the human body and examination of every skin case should include a complete physical and mental appraisal, especially during the initial consultation.

Treatment of this disease depends on the aetiology. Organic lesions should be removed and nutritional deficiencies (e.g. pellagra, folic acid, Vitamin B12) corrected. For the pure psychosis such as present in our case, psychiatric treatment is known to be unfavourable and the response is often slow. (Schurt & Waldron, 1963; Aleshire, 1954).

(2) SYPHILOPHOBIA – NEUROTIC EXCORIATION

A 20-year-old female typist complained of a lichenoid rash on both buttocks for about two months and the referring doctor suspected some form of contact allergic dermatitis.

She had no history of hypersensitivity to drugs or contact allergens prior to this condition. She had been distressed because the pruritus disturbed her work and kept her awake at night. A cursory examination of both buttocks revealed normal skin except for some excoriations and some folliculitis. The site of the rash, which was found at both gluteal folds, did not conform to any known contacting materials, and skin scrappings as well as Wood's Light examination of these areas revealed no evidence of superficial mycoses. Patch tests with nylon, azo dyes, rubber and so forth yielded negative results.

She was managed symptomatically with antihistamines and topical steriods, but for the next few months, her symptoms deteriorated. There were now lichenoid patches in addition to the excoriations over the gluteal folds (Figure 3), and she showed marked depression and anxiety.

Thorough physical examination as well as numerous haematological and biochemical investigations showed no associated systemic diseases.

The patient later volunteered the interesting history that the "rash" appeared on the very day when

Fig. 3: Lichenoid patches at the gluteal folds.

she was travelling home in a bus. She took over a "warm" seat just vacated by a fat man whom the patient strongly and firmly believed to have "syphilis", although she had never seen him before. She then thought that her buttocks had contracted the man's disease even though there was no direct physical contact between her gluteal skin and the seat. At that time, no one had informed her how V.D. was transmitted. That night, the fear of the acquired "syphilis" grew. She washed and cleaned her buttocks with various medicated preparations, and when she was in bed, she scratched and rubbed both gluteal regions in an unconscious attempt to rid the contacted skin of the dreaded disease. Scratching and rubbing had been going on for many days before she consulted her own doctor.

Before this disease, she had little knowledge of sex or venereal diseases, although she had passed the Senior Cambridge. Most of her sexual information came from her illiterate elders and her misinformed friends. She was an introvert, religious and rarely mixed with people. She had a boy friend who was fond of her but they never indulged in discussion about sex or had any sexual contact. Recently, she had been reading some medical textbooks and visited the medical exhibition on VD, and now seemed to understand how venereal diseases were transmitted.

However, in spite of our reassurance, explanation, and showing to her that her serological and other tests were essentially normal, her phobia persisted and her pruritus remained. Lately, she even complained of itchiness and alopecia of her pubic hair, recurrent attacks of foul vaginal discharge, swelling of her vulva and various non-descriptive complaints. Most of the investigations done were within normal limits. Suspecting that she had delusional symptoms referring to the skin, psychiatric opinion was sought and she was found to suffer from early schizophrenia.

With regular psychiatric treatment her neurotic excoriations, phobia for syphilis and delusional states had disappeared and she had since then been free from any cutaneous symptoms.

Comment

The fear of syphilis or syphilophobia, though rare among the more advanced society, is still encountered amongst the illiterate, the ignorant and the misinformed. That the disease can easily be treated and cured is generally known and this knwoledge probably reduces the incidence of syphilophobia. People suffering from this disorder are often normal persons with feeling of sexual guilt, neuroses and obsession. Occasionally, the sufferers are themselves VD patients who have been cured of the disease. The phobic patient lives in fear of acquiring the disease although he or she realises that the disease is not present.

Neurotic excoriations may occur together with syphilophobia as seen in our patient, and the dermatitis artefacta thus produced could be extremely misleading indeed. A lot of unnecessary investigations would not have been carried out if the patient's true history was obtained in the early stage of the illness. Sometimes the fault lies with the attending physicians because the patient's trust and cooperation were not obtained, either due to lack of time for a proper consultation, or due to the attitude and behaviour of the doctor. Since most phobic subjects are non-psychotic cases, the treatment is to convince the patient that he or she is free of the disease by frank and sympathetic discussions.

When phobias are attended with bizarre cutaneous delusions, overt schizophrenia should always be suspected (Zaiden, 1950), and this is what we learn from the case described above.

Again, this case demonstrates the importance of cutaneous manifestations of psychological disorders. The diagnosis of neurotic excoriations or dermatitis artefacta should alert one to look for some underlying emotional disturbance as well as the underlying aetiology.

TRICHOTILLOMANIA

A young Chinese schoolgirl, aged 14, had been to various "hair" clinics in Singapore, seeking treatment for her intractable alopecia during the past 2½ years, before she was seen by us.

Hair loss patchy, progressive and accompanied by some degree of pruritus. Alopecia involved not only the scalp but also the eyebrows and eyelashes. There were no systemic illnesses or other skin lesions. On removing her wig, the scalp hair showed irregular patches of alopecia where the hairs were broken at different levels. There were no gross evidence of fungal or parasitic diseases and the hair shafts looked normal and healthy.

On closer questioning, her mother, whom we later discovered was the "adopted" mother, volunteered the history that the hair loss was due to self-inflicted hair-pulling tics started over 2½ years ago after an emotional upset. According to close relatives, the patient was adopted very young and had been the apple of her adopted mother's eye. The mother-child relationship was good until the patient discovered that she had no father as her adopted mother was not married, that she was an adopted child, and that her real parents were alive and living somewhere nearby. After the psychological shock, she pleaded repeatedly to see her real parents but her requests were refused because the adopted mother feared that she might go back.

Soon after this event, her behaviour changed. She became very restless, defiant, frustrated and resentful. For example, she started to disobey her mother's orders, stayed away from home when she liked, and it was then observed that she started to pull, twist and tug her hair. At first, the compulsive hair pulling was confined to the scalp, but later she pulled hairs from her eyebrows and eyelashes and sometimes even bit her finger nails. It was also noticed that the pulling often occured at home in full view of her mother and was more severe during periods of stress and excitement, like taking school examinations and watching thrilling television programmes. Her mother's threats, coaxings and persuasions were of no avail as she continued with the habital tics. Her work at school was considered good, but she seldom had close friends and usually kept to herself.

When examined, it was found that her hair loss involved the whole scalp except the sides, nape of the neck and a small parietal area (Figures 4 & 5). The pattern of hair loss was known as "tonsure trichotillomania", described by Sanderson and Hall-Smith (1970). There were also patchy alopecia of the eyebrows and eyelashes. Affected areas were irregularly scattered and of different sizes and shapes. Their outlines and margins were ill-defined and the broken hairs were of unequal length, twisted and broken at various levels from the scalp surface. Fresh plucked areas showed hair follicles with bleeding points, and

Fig. 4: Tonsure trichotillomania — back view.

Fig. 5: Tonsure trichotillomania — side view.

older lesions had evidence of excoriations and infections. The hair shafts were structurally normal and revealed broken ends under light microscopy. There was no evidence of cutaneous infections or infestations.

Both the patient and her mother were sent to see the social worker and the psychiatrist for further management. To-date, no improvement in her compulsive hair-pulling or the mental attitude of the patient had been noted because the adopted mother insisted on keeping the real parent's identities a secret as she was afraid to lose her daughter.

Comment

Trichotillomania occurred in two distinct forms:

(1) The commoner form, which occurs in children between the ages of 4 to 10, and the alopecia patterns produced are frontoparietal or frontotemperol baldness. Although these nervous tics are not uncommon in the mentally retarded, normal children under emotional stress may pluck their hair usually before going to sleep or concentrating on a problem. Severe cases may even swallow their hair and present later as intestinal obstruction from the bolus.

(2) The rarer and more serious form which occurs in adults, usually in the adolescent stage (as seen in our patient). Women predominance is often the rule, and the pattern of hair loss is more generalised or tonsure in appearance (Sanderson & Hall-Smith, 1970). Patients in this group often have overt psychiatric disorders, depressive psychosis and problems of parent-child relationship, such as found in our case. This disease and its psychiatric aspects have been widely studied elsewhere (Sabouraud, 1936; Zaidens, 1951; Monroe & Abse, 1963; Mono-Ashman, 1964; Greenberg & Sarner, 1965).

As illustrated above, trichotillomania may present as some common hair or scalp disorders, e.g. alopecia areatic, tinea capitis, etc. Absence of other pathological conditions, together with the typical history of hair pulling and the pattern of hair changes, will firmly establish the diagnosis. Much more difficult than establishing the diagnosis is the management of the underlying emotional problems. Disturbance of parent-child relationship is obvious in our case, and the compulsive hair-pulling is but a form of protest or frustration shown by the patient at being denied the presence of her real parents. The fault lies squarely with her adopted mother who herself was unstable and selfish in character. Her action could only serve to perpetuate the patient's unhappiness and prolong her neurotic symptoms.

(4) DERMATITIS ARTEFACTA (FACTITIAL DERMATITIS)

A Malay guard, aged 52, developed hypertensive cerebral haemorrhage in 1967 and as a result, he had difficulty in speech, slow cerebration, weakness of right limbs and diminished sensory function in the right half of the body. He was unemployed after his discharge although he tried unsuccessfully as a recording clerk for a short period. He became depressed because of the physical disability and financial problems.

Several months later, he frequented the skin clinic with long and woeful complaints of nondescriptive skin lesions. Bizarre forms of "dermatitis" appeared on the right upper and lower limbs as well as on the right chest and abdomen. Because of these lesions, he

Fig. 6: Dermatitis artefacta on the right palm.

argued he was unable to get employment and strongly demanded social welfare relief and other monetary benefits.

The "dermatitis" consisted of a number of well-defined rectilinear burns or scars found on the right palm, flexural aspect of the right arm, some parts of right shoulder, right chest, right thigh, right soles and the tip of the glans penis. The lesions were almost identical in size and shape (¼" x 2") and looked as though they were induced manually (Figures 6, 7 & 8). The fresh ones were red, tender and swollen with blister formation, while the older ones were pigmented and firm, consistent with scar formation. The surrounding skin and regional glands were not enlarged.

The distribution and configurations of the unusual dermatoses were strongly suggestive of self-applied trauma or burns, especially as it was known that his right body was hypoaesthetic and there was a strong motive of monetary gain. However, he repeatedly and vehemently denied the lesions were self-inflicted and maintained that they appeared spontaneously.

His family was then interviewed. They confirmed our suspicion that the factitious skin changes were caused by mechanical means. The patient had been to the local medicine-man, who burned the skin of his right limbs periodically with hot iron rods in an obvious attempt to restore his motor power and sensory loss. Using these feigned eruptions, the patient took the opportunity to demand various financial aid and for monetary gain.

Consequently, he was referred to the psychiatrist for treatment as he developed organic dementia and delusions from extension of cerebrovascular frontal lobe involvement.

Fig. 7: Reticulolinear scars produced by burns on the right arm.

Fig. 8: Typical burn lesions recently induced, on right foot.

Comment

Dermatitis artefacta by neurotic or malingering patients can be mistaken for spontaneous dermatoses if one is not alerted to the possibilities and to the clues. Such lesions are commonly self-inflicted or sometimes produced in collusion with someone else (e.g. the medicine-man in our case) for the purpose of direct material gain or for some psychological motivation. Factitial dermatitis is generally produced by mechanical or chemical means and the sites of the eruptions are generally anatomical sites accessible by hand and reflect the right or left-handedness of the person. Thus, our patient with hemiparesis of the right limb could use the normal left hand to create the feigned eruption on the opposite limbs which were hypoaesthetic to burns. Some of these burns were made by the medicine-man as some local races believe that these "acupunctures" will restore the function of the paralysed sides. Using these "dermatitis" as further excuse of his physical disabilities, our patient sought to obtain monetary gain and social aid. There was no doubt that he was a desperate and frustrated man and his motivation could, in some way, be attributed to the mental changes from the cerebrovascular accident. As the organic disease is progressive and irreversible in this case, the prognosis is poor.

Most cases with this disorder are young women with hysterical personalities lacking love, affection and having inferiority complex. (Butterworth & Strean, 1963; Zaiden, 1951). The emotional factors which precipitated the dermatitis artefacta should be solved by close interviews, reassurance and explanations. Occasionally, the help of the social worker and psychiatrist should be sought.

CONCLUSIONS

Four cases illustrating the role of psychiatric factors in dermatology are presented and discussed. They emphasise the importance of regarding and managing the patient with skin diseases as a whole, and not just confining to the dermatoses. With the rapid modernisation of our society, exposing us to the increasing stress and strain or our daily lives, psychocutaneous disorders are on the increase in this region.

This paper hopes to remind practitioners of the unusual cutaneous manifestations of mental disorders, which, if unrecognised, may masquerade as common dermatoses and will delay the early treatment and recovery of the affected patients.

REFERENCES

1. Aleshire, I. (1954) : Delusion of Parasitosis – Report of successful case with antipellagrous treatment. *J. Amer. Assoc.*, 155:15.
2. Brunner, M.J., (1948) : Biological basis of Psychosomatic diseases of the skin. *Arch. Derm. Syph.*, 57:374.
3. Butterworth, P.A. & Strean, L.P. (1963) : Psychocutaneous Disorders. *Arch. Dermm.* 88:859.
4. Cormia, F.E.)1947) : Psychosomatic factors in dermatoses. *Arch. Derm. Syph.* 55:601.
5. Cormia, F.E. (1951) : Basic concepts in the production and management of the psychosomatic dermatoses. *Brit. J. Derm.* 63:83.
6. English, O.S. (1949) : Role of emotion in disorders of the skin. *Arch. Derm. Syph.* 60:1063.
7. Greenberg, H.R. & Sarner, C.A. (1965) : Trichotillomania. *Arch. gen. Psychiat.* 12:482.
8. Halliday, J.L. (1944) : Psychosomatic medicine and rheumatism problems. *Practitioner* 152:6.
9. Hallsmith, S.P. & Norton, A. (1952) : Psychiatric survey of a random sample of skin outpatients. *Brit. Med. J.* 2:417.
10. Klauder, J.V. (1936) : Psychogenic aspects of skin diseases. *J. Nerv. Ment. dis.* 84:249.
11. Mono-Ashman, D. (1964) : Trichotillomania. Trans. *St. John's Hosp. derm. Soc. London.* 50:176.
12. Monroe, J.T. Jr. & Abse, D.W. (1963) : The Psychopathology of trichotillomania and trichophagy Psychiatry. 26:95.
13. Obermayer, M.E. (1955) : Psychocutaneous Medicine Springfield. Ill. C.C. Thomas Publisher.
14. Pittsburg, D.M., Shelley, W.B. & Kligman, A.Am (1956) : Psychocutaneous Medicine in Text Book of Dermatology. Saunder, W.B. Co. Philadelphia & London. Pg. 1215.
15. Rook, A & Wilkinson, D.S. (1968) : Psychocutaneous Disorders in Text Book of Dermatology. Vol. 2 Rook et al (Ed). Blackwell Scient. Public Oxford and Edinburgh. Pg. 1587.
16. Rostenberg, H. (1966) : The role of psychogenic factors in skin diseases. *Arch. Derm.* 81:83.
17. Rubin, Z., Rabiner, C., & Warren, S. (1966) : Psychocutaneous Medicine. *Arch. Derm.* 93:466.
18. Sabouraud, R., (1936) : Tricholasie Idiopathique In Nouvelle Pratique. Ed. J. Darier et al, Paris, Masson. 7:119.
19. Sanderson, K.V. & Hallsmith, P. (1970) : Tonsure Trichotillomania. *Br. J. Derm.* 82:333.
20. Schurt, A.H. & Walderon, W.G. (1963) : Psychiatric and Entomological aspects of delusory parasitosis. *J.A.M.A.* 186:429.
21. Slorach, J. (1953) : Emotional factors in skin diseases. Ed. Wittkower E. & Russell B. Lond. Cassell.
22. Tullet, G.L. (1965) : Delusion of Parasitosis. *Arch. Derm.* 66:577.
23. Wilson, W.J. (1952) : Delusion of Parasitosis. *Arch. Derm.* 66:577.
24. Wilson, W.J. & Miller, H.E. (1946) : Delusion of Parasitosis (acarophobia). *Arch. Derm. Syph.* 54:39.
25. Wittkower, E. & Russel, B. (1956) : Emotional factors in skin diseases. N.Y. Hoeber Med. Div., Harper & Rower Publisher. Pg. 11.
26. Zaiden, S.H. (1951) : Self-inflicted dermatoses and their psychodynamics. *J. Nerv. Ment. Dis.* 113:395.

Weight and height curves for Malaysian schoolchildren

by
S.T. Chen
and
A.E. Dugdale

Department of Paediatrics,
University of Malaya,
Kuala Lumpur.

INTRODUCTION

THERE IS GOOD EVIDENCE (Jelliffe 1966) that the state of nutrition and health of a child affects his rate of growth. The position of a child on a growth curve relative to other children of the same age therefore gives indirect evidence of his wellbeing. However, growth curves for Malaysian school children are not readily available. The present study gives standards for height and weight of a privileged group of school children.

MATERIAL AND METHODS

The data used in this study were from children in schools in Kuala Lumpur and Petaling Jaya. Boys and girls from all ethnic groups were included. Only children from families with an income greater than $500 a month were considered, as this gave a group of relatively privileged children, who should be free from malnutrition, heavy worm loads and other factors known to retard growth.

The children were weighed and measured by class teachers in the schools, using equipment already in the schools. We were not able to check the accuracy of this equipment. The data were punched on to cards, and sorted to produce percentile charts of height and weight.

RESULTS

Data were available from 709 boys and 550 girls. The ethnic group, sex and age distribution of the sample is shown in Table 1.

The growth curves for height and weight are shown in Figures 1–4. In each figure, the 10th, 50th and 90th percentile lines are shown. The 50th percentile line has been drawn so that 50% of the children at a given age are below that level of weight or height. Similarly, 10% fall below the 10th percentile line and 90% below the 90th percentile line.

In each figure, the line marked with asterisks is the 50th percentile line for the Stuart-Stevenson standard, which was derived from American children (Nelson 1964).

DISCUSSION

The children in this study came from relatively privileged homes. As growth is influenced by good nutrition and lack of disease, these children should be taller and heavier than most children in Malaysia. Many children, particularly in rural areas, will appear shorter and lighter than the average of these growth charts, because of their poor nutritional and social conditions.

As the weights and heights were measured on equipment which has not been checked for accuracy, some caution must be used in interpretation of the results. If the errors in the equipment were random, the 50th percentile line should be reasonably accurate, but the 10th percentile line will be lower and the 90th percentile line higher than they should be.

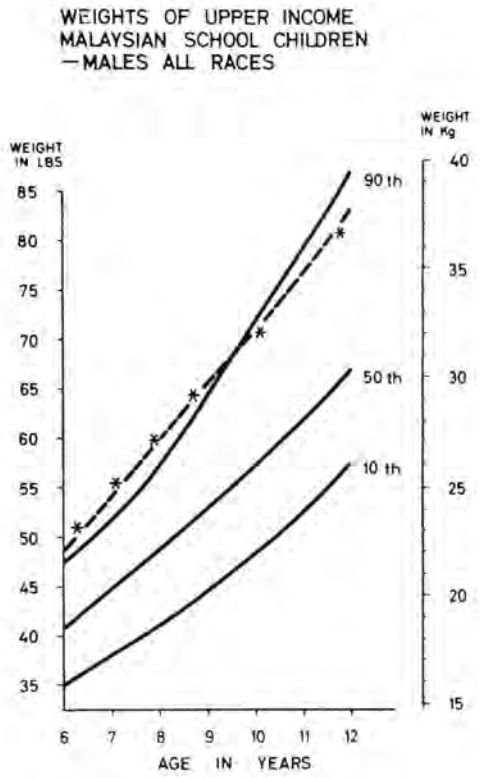


Fig. 1: **The percentile charts for weight of boys. The 10th, 50th and 90th percentile levels are shown. The line marked with asterisks is the 50th percentile of the Stuart-Stevenson standard.**

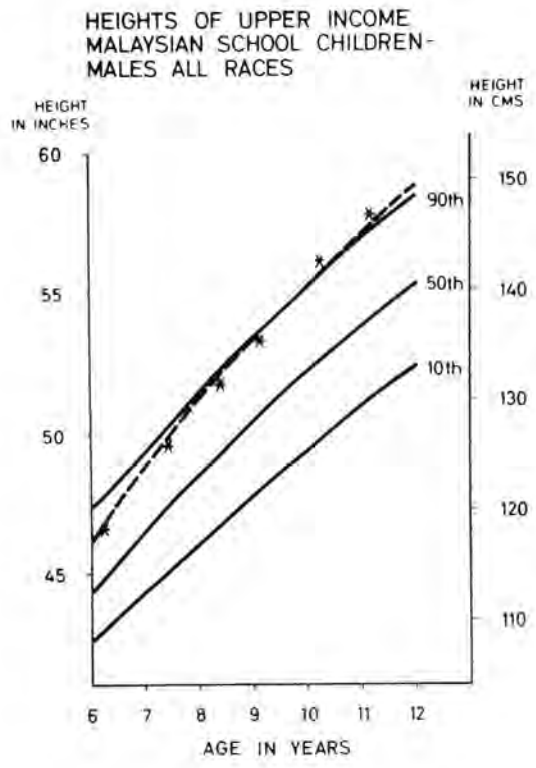


Fig. 2: **The percentile charts for height of boys. The 10th, 50th and 90th percentile levels are shown. The line marked with asterisks is the 50th percentile of the Stuart-Stevenson standard.**

The data from American studies show that children in Malaysia, even from relatively privileged families, are smaller and lighter for age than those in American studies. Similar results have been found in infants (Dugdale 1969) and in pre-school children (McKay et al, in press). It seems likely that this difference will diminish as the standards of nutrition and health improve in Malaysia.

Copies of the growth charts are available from the authors.

SUMMARY

Height and weight charts for Malaysian children aged from 6–12 years are presented.

ACKNOWLEDGEMENTS

We thank the Kementerian Pelajaran for giving us access to children in the schools and the school teachers for gathering the data for this study, and the Department of Medical Illustration, University of Malaya.

REFERENCES

Dugdale, A.E. "The weights of Malaysian infants up to one year". *Med. J. Malaya, XXIII*, 244. 1969.

Jelliffe, D.B. "The assessment of the nutritional status of the community". *W.H.O. Geneva.* 1966.

McKay, D. et al "Comparative growth achievement of Malay pre-school age children" (in the press).

Nelson, W. "Textbook of Pediatrics". 8th ed. 1964 pub. Saunders, Philadelphia.

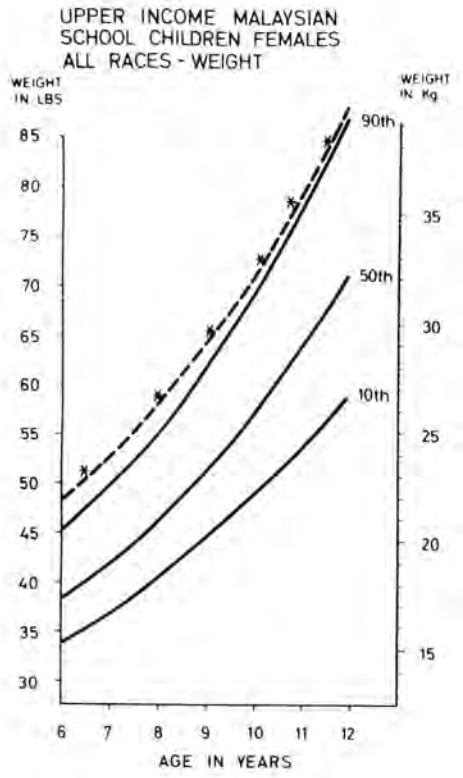


Fig. 3: **The percentile charts for weight of girls. The 10th, 50th and 90th percentile levels are shown. The line marked with asterisks is the 50th percentile of the Stuart-Stevenson standard.**

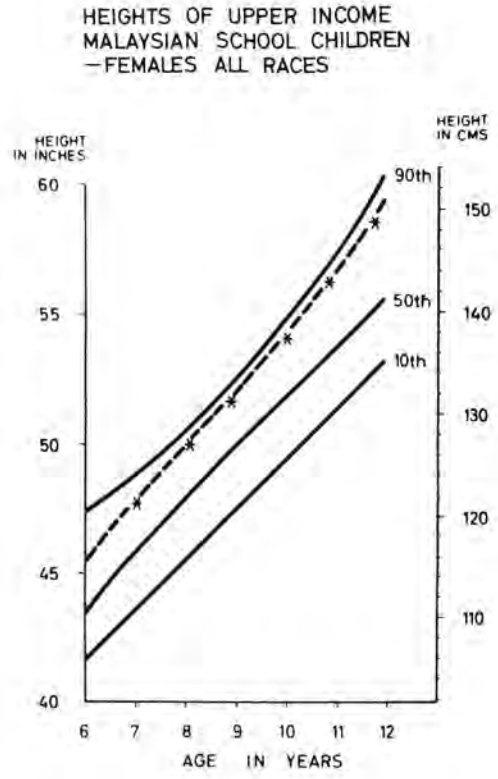


Fig. 4: **The percentile charts for height of girls. The 10th, 50th and 90th percentile levels are shown. The line marked with asterisks is the 50th percentile of the Stuart-Stevenson standard.**

Age in years	6		7		8		9		10		11		12	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Ethnic Group														
Malay	34	25	40	26	40	31	35	37	31	27	39	31	1	7
Chinese	56	41	57	46	64	36	60	60	52	44	35	42	0	0
Indian	27	9	17	20	17	15	26	17	24	6	25	8	2	0
Others	4	4	4	3	7	6	5	4	3	3	4	2	0	0

Table 1: The age, sex and ethnic group distribution of the children in this study.

Foetal growth retardation

by N. Paramaesvaran
MBBS, MRCP (Ed.), DCH
General Hospital,
Kota Bahru.

THE INTERNATIONAL DEFINITION of a premature infant is a live born infant with a birth weight of 5½ lb. (2.5 kg.) or less. The inadequacy of this definition was obvious for various reasons; one of these was that it did not separate a small group of babies, who were small for the particular gestation involved. These babies were labelled variously as pseudo-premature, intrauterine growth retardation, dymaturity, etc. Butler and Bonham (1963) described them as "small for date babies" and defined them as babies who are two standard deviations below the expected weight for the particular gestation.

Clinically, these infants are usually thin, long with wrinkled, dry, peeling meconium-stained skin and with an unusual lively alert appearance. They usually have well-developed grasp and sucking reflexes.

Sometimes it is difficult clinically to separate SFD babies from premature babies. Calculation of gestation can sometimes be difficult because one is dependent on date of last menstrual period. Neurological testing was introduced as a method of estimating gestation. Robinson (1966) found that neurological reflexes could be used with some degree of accuracy to estimate gestation and with the knowledge of gestation, one can decide whether an infant is small for date.

The recognition of these "small for date babies" was important as the perinatal mortality in this group was high. Butler and Bonham (1965) found that in 1958 in England 69/1,000 "small for date babies" born at 36 weeks' gestation or over died during labour or in the neonatal period.

The major causes of death were intrapartum asphyxia, pneumonia, and massive pulmonary haemorrhage (Table 1). These babies are easily chilled because of the lack of subcutaneous fat. There was also an increased incidence of hypoglycaemia.

Gruenwald (1963) described the characteristic necropsy finding.

There was a lack of subcutaneous fat, the liver thymus and lungs were relatively small, but the body length and heart weight were relatively big for the particular weight of the infant. Brain weight was found to be much heavier than expected. Also the brain, liver ratio (normal = 3:1) was increased to 6:1 and liver glycogen was found to be low.

Placental findings varied. In women, who had toxaemia, there was infarction of the placenta with obliteration of vessels to placenta. In others, there was a reduction in placental size. Primary placental abnormalities have also been described.

Etiology

With the recognition of the clinical features and pathological findings, it was necessary to try to understand the possible etiology of these "small for date babies."

Foetal growth is theoretically dependent on:—

i) Nutrition: both quantity and quality.
ii) State of maternal circulation to the placenta.
iii) State of the placenta
iv) State of the foetal circulation
v) The genetic potential of the foetus

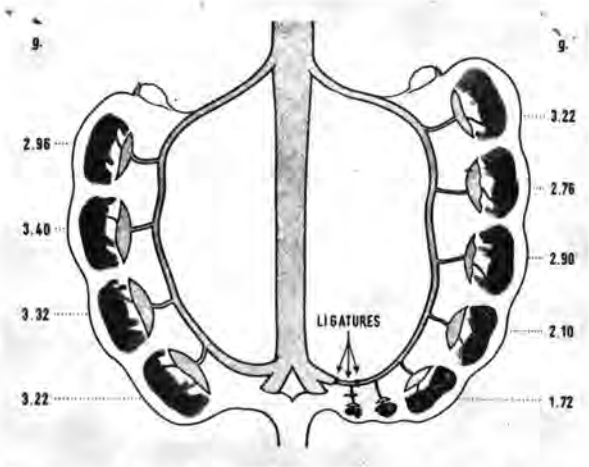


Fig. 1: **Foetal growth retardation produced by ligating one horn of the uterine artery (J.S. Wigglesworth Journal of Path and Bact. 1964.)**

vi) The ability of the foetus to assimilate the nutrients supplied.

The effect of nutrition on foetuses has been extensively studied in animals. Wallace L.R. (1945), working on ewes, showed that when pregnant ewes were fed on a low plane of nutrition in the last six weeks of pregnancy, the lambs were 40% below the expected weight.

These nutrition experiments have been done on rats with similar results. (Benjamin W. Beg 1965), Wigglesworth J.S. & Paramaesvaran N. (1968 unpublished) starved pregnant rats in the last three days of pregnancy. The foetuses were delivered by Caesarian section a day before delivery. The foetuses were found to be grossly retarded. (Fig. 2) The brain was little affected but the liver was grossly retarded. Using a biochemical method to analyse DNA content of the liver and brain and then using these figures to work out the total cell count, it was found that the retardation was due to both a reduction in cell size and cell number (Table 2).

The part played by the maternal circulation to the placenta was studied by Wigglesworth J.S. (1964) on rats. The blood supply to foetuses in a rat is derived from both the uterine and ovarian artery. (Fig. 1). The uterine artery to one born was ligated on Day 16 of pregnancy. The foetuses were delivered by Caesarian section a day before delivery. The foetuses on the ligated side were growth retardated, the severity becoming less as one moved away from the site of ligation.

Butler, W.H. & Wigglesworth, J.S. (1966), also

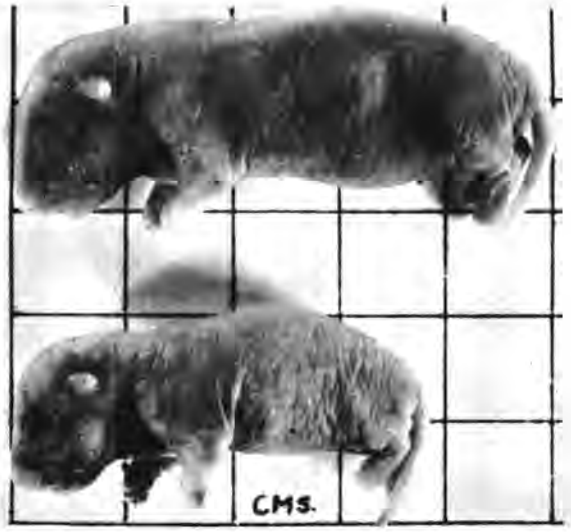


Fig. 2: **Foetal growth retardation produced by starving pregnant rats in the last three days of pregnancy.**

studied the effect of maternal liver damage on the foetuses. Aflatoxin BI was injected into pregnant rats on Day 16. Aflatoxin BI inhibits protein synthesis in the liver. This means reduced aminoacids for foetal growth.

Foetuses were growth retarded, but showed no effect of the drug themselves. Maternal liver showed histological damage.

DISCUSSION

In man, the part played by nutrition is thought to be small. It has been found that even in starvation, the weight reduction of foetuses was only about 200 gm.

It is known that maternal hypertension and toxaemia of pregnancy are associated with "small for date babies." Pathological findings show arterial

Table 1

MORTALITY RATES PER THOUSAND FROM RESPIRATORY AND CEREBRAL CAUSES OF "SMALL FOR DATE" BABIES (BORN AT 36 WEEKS GESTATION AND OVER (BUTLER 1965)

	'Small for Date babies.'	Normal for date babies
Intrapartum asphyxia	23.8	4.4
Pneumonia	10.7	0.8
Massive pulmonary haemorrhage	9.5	0.1
Cerebral birth trauma asphyxia	5.0	2.1
Hyaline membrane	4.5	0.1
Intraventricular haemorrhage	1.6	0.0
Total deaths	68.5	8.8

Table 2
STARVATION EXPERIMENT ON PREGNANT RATS

	CONTROL	STARVED	PROBABILITY
FOETAL WT.	5.866 gms.	4,437 gms.	– 24.4%
BRAIN WT.	224.7 mgms.	205.5 mgms.	– 8.55%
TOTAL CELL COUNT	139.8×10^6	138.2×10^6	– 1%
LIVER WT.	441 mgms.	278 mgms.	– 37.0%
TOTAL CELL COUNT	321.6×10^6	245.9×10^6	– 23.6%

obliteration with infarction of the placenta. This corresponds well with the ligation experiments of Wigglesworth, J.S. (1964). Gruenwald (1963) also found primary placental abnormalities associated with these "small for date babies." This indicates that vascular causes, resulting in reduced nutrients to the foetus, play an important part in growth retardation.

There is an inverse relationship between litter size and birth weight both for polytoccous animals and man. There is a progressive decrease in weight in twins, triplets and quadruplets. The stage when the foetus gets retarded in man is thought to occur when the total weight of foetuses is 7 lb. (McKeown & Record (1952)). Therefore, this retardation in multiple pregnancies occurs earlier in triplets than in twins.

The foetal growth retardation occuring in multiple pregnancies could be the result of a vascular as well as a nutritional cause. Maybe, both factors play a part.

A rarer cause of foetal growth retardation in twin pregnancies is the intrauterine transfusion syndrome where blood passes from one twin to the other causing one to be anaemic and small, and the other well developed.

Foetal weight varies with the different races. Socio-economic factors must play an important role here. We also know that the average foetal weight increases with parity and decreases with age (after 30). The above factors suggest that maternal environment is another very important factor influencing foetal growth.

Although the genetic potential plays an important role in deciding adult height, foetal growth is not much influenced. But congenital disorders, both chromosomal and others, can influence foetal growth. We know that in the congenital Rubella Syndrome, growth retardation is present.

In conclusion, it is obvious from the clinical and experimental studies done on foetal growth retardation, that the etiology must be multifactorial. But because of these studies, one is now able to recognise these babies, sometimes predict their birth and so be able to give them the special care and attention they need. This may help reduce the high perinatal mortality that occurs in this group. But there is still a lot to be known before one can prevent the occurence of "small for date babies."

ACKNOWLEDGEMENTS

I) The unpublished work on rats by J.S. Wigglesworth and Paramaesvaran was carried out at the Institute of Child Health, Hammersmith Hospital, London, W.12. The author is grateful to Prof. J.P.M. Tizard and J.S. Wigglesworth for allowing him to carry out this work under their supervision.

II) Grateful thanks to Miss Azizah bt. Ariffin for clerical help.

BIBLIOGRAPHY

1) Butler N.R. & Bonham D.G. (1963). Perinatal mortality Livingstone, Edinburgh.
2) Butler N.R. (1965). In Gestational Age, Size, and Maturity Clinical Develop Med. No. 19 Ed. M.J.R. Dawkins and W.G. MacGregor London p. 74.
3) Benjamin W. Berg. (1965). Dietary Restriction and Reproduction in the Rat. *J. Nutrition* p. 87.
4) Butler W.H. & Wiggleswroth J.S. (1966). Effects of Aflotoxin B, on the pregnant rat. *Brint J. Exp. Path* 47, 242.
5) Donnelly, J.F. Jr. (1964) *Clin. Obstret, Gynae* 7, 647.
6) Gruenwald P. (1963). Chronic Foetal Distress and Placental Insufficiency. *Biol. Neonat. Basel* 5, 215.
7) McKeown T. & Record R.G. (1952) *J. Endoc.* 8, 386. 36.
8) Robinson R.J. (1966) *Arch. Dis. Child* 41, 437.
9) Wallace L.R. (1945) *J. Physiology, London* 104, 34.
10) Wigglesworth J.S. (1964) *J. Path. Bact.* 88, 1.
11) Wigglesworth J.S. (1968) Aspects of Praematurity and Dysmaturity, Nutricia Symphosium.

Mitral valvotomy in Malaysian patients of 20 years of age and below

Summary:
THE MANAGEMENT of 76 young patients with rheumatic mitral stenosis in Malaysia is reported. They are divided into two groups on the basis of clinical findings, namely, those with pure mitral stenosis and those with predominant mitral stenosis. The surgical findings are presented as well. The operative mortality in patients with predominant mitral stenosis is almost double that in patients presenting with pure mitral stenosis. Some aspects of the clinical manifestations of the disease are very similar to those reported from India.

by
M. Krishnan)
and
M.R.J. Snelling)

Lady Templer Hospital,
Kuala Lumpur,
Malaysia.

Material:

Surgical relief of rheumatic mitral stenosis in the young has been reported over the years, as a problem peculiar to certain countries, for example, India (Cherian et al (1964), Roy et al (1963), Sen et al (1966) and Iraq (Al-Naaman et al (1966)). We present our experiences in Malaysia in a series of 76 young patients, who underwent surgery during a period of ten years from January 1959 to December 1968 (Table 1). During this period, a total of 293 mitral valvotomies were performed on patients of all ages.

Table 1

Age	No. of Patients
9 – 11	7
12 – 14	15
15 – 17	29
18 – 20	25

Of the above series, 42 were females and 34 were males, giving only a very negligible preponderance of females.

Malaysia is a multi-racial country, with roughly an equal proportion of Malays and Chinese, and about 10% of the population is Indian. There are also 45,000 Aborigines and whilst some rheumatic mitral stenosis is found amongst them, these patients have not been operated upon for various reasons. Of the series of 76 mentioned above, 27 were Malays, 34 Chinese and 15 Indians. There does not seem to be any racial predilection to this disease.

The majority of these patients (64, i.e. 84.2%) came from the rural areas of the country, where the well-known predisposing factors for rheumatic fever prevail – damp, misty riverine conditions, lack of medical care, poor nutrition and ignorance. It is not uncommon to see, under these circumstances, several members of a whole family presenting with manifestations of rheumatic carditis.

A definite history of rheumatic fever was obtained only in 21 cases. Too much reliance cannot be placed on this figure, as history-taking was incomplete in the earlier days. However, amongst these 21 cases, 15 underwent a mitral valvotomy

within five years of the onset of their rheumatic fever, and the remaining six had their operation within ten years. This is similar to the findings of Cherian et al (1964) and Sen et al (1966), that rheumatic carditis, leading to critical mitral stenosis, occurs more rapidly in this part of the world.

The symptomatology of these 76 patients is shown in Table II.

Table II

Symptoms	No. of Patients
Dyspnoea	66
Palpitations	35
Haemoptysis	16 (21%)
Chronic cough	10
Tiredness	9
Ankle oedema	6
Embolic episode	1 (about 1%)
Asymptomatic	6

We believe that mitral valvotomy should be performed only when progressive symptoms of mitral stenosis arise. However, it will be observed that six patients were asymptomatic but mitral valvotomy was performed to enable them to obtain employment.

Dianostic Criteria:

The diagnosis of mitral stenosis was made entirely on the basis of clinical examination, chest X-ray and E.C.G. records, to the exclusion of elaborate diagnostic methods. We based our diagnosis of mitral stenosis on a tapping apex beat, the presence of a diastolic thrill (this is sometimes absent) and a mid-diastolic murmur leading to a loud first heart sound in the mitral area. An accentuated pulmonary second sound, together with evidence of right ventricular hypertrophy on E.C.G. and the presence of a large left atrium on chest X-ray, were additional factors leading to the diagnosis. There were 53 patients in this category and for subsequent discussion we call this group, Group A.

The remaining 23 patients had a short systolic murmur in the mitral area in addition to the above findings, but were considered to be predominantly mitral stenosis cases. This group will be referred to as Group B.

In addition to the above diagnostic criteria, an opening snap was heard in 23 patients; Kerley's lines on chest X-ray was seen in nine patients.

Radiological evidence of cardiac enlargement was noted in 60 patients; 19 of these belonged to the predominantly mitral stenosis group. Three patients revealed E.C.G. evidence of atrial fibrillation.

Operative Findings:

The nature of the valve leaflets, as felt by the finger in all instances, was expressed as (a) healthy, (b) rough, nodular or sclerotic, and (c) calcified. There were no clots in the atrium in either group. The valve size and the presence or absence of regurgitation before and after valvotomy were recorded as well. The majority of the valvotomies were performed with the transventricular dilator.

GROUP A — Clinically pure mitral stenosis

In this group of 53 patients, 15 had rough, nodular and sclerotic valves. The remainder presented with healthy valves. There were 40 patients with a valve orifice of 1 cm. or below and ten of these had valve orifices of 0.5 cm (19%). The remaining 13 patients had valve orifices of above 1 cm. Regurgitation was felt in 11 of the 53 and occurred in a further six patients following valvotomy. Four patients died after surgery (operative mortality of 7.5%).

GROUP B — Predominant mitral stenosis

Of 23 patients, seven had rough, nodular and sclerotic valves. All three calcified valves were felt in this group. Eighteen patients had a valve orifice of 1 cm. or less and eight of these patients had a valve orifice of 0.5 cm (35%). The remaining patients had a valve orifice of above 1 cm. Regurgitation was felt in six patients and incompetence occurred in a further six after valvotomy. Three patients died after this operation (mortality of 13%).

The overall mortality in the 76 patients was 9.2%.

Follow-up:

We regret to say that follow-up was possible in only 32 (42%) of this series of 76 patients. Because of a mobile population, it has generally been difficult to get patients who have undergone surgery to attend a particular clinic with any degree of regularity thereafter. The period of the follow-ups available to us varied from one to eight years after valvotomy.

Table III

Time	No. of patients
0 — 1½ years	20
1½ — 3 years	8
Above 3 years	4
	32

The six asymptomatic patients are all well and working. Of the remaining patients followed up, 22

benefitted from surgery in that they were rendered asymptomatic and are leading normal lives. Four patients have developed symptoms mainly of effort dyspnoea, one of whom, after 5½ years, has definite signs of re-stenosis.

Discussion:

The 76 patients in this series formed about 26% of the total number of valvotomies performed during the 10-year period under review. the male:female ratio is almost equal. In the symptomatology, the incidence of haemoptysis was 21% and embolic phenomena about 1%. These findings are very similar to those reported from India, but differ from the facts published by Sellors et al (1953), Goodwin et al (1955) and Wood (1954) from the U.K., who reported a female preponderance and a much higher incidence of haemoptysis and embolic phenomena.

It is interesting to note that 18 of the 23 patients, presenting as predominant mitral stenosis, had valve orifices of 1 cm. or less. The presence of a systolic murmur in three patients with calcified valves and in three patients with auricular fibrillation can be accounted for, but in the remaining 17 patients, the explanation for the presence of a systolic murmur seems to be obscure on clinical grounds.

Acknowledgement:

We wish to thank Mr. H. M. McGladdery, O.B.E., F.R.C.S., who performed the majority of the valvotomies and also Miss M. Lee for her secretarial help.

References:

1. Al-Naaman Y.D. Thame M.A., Al-Bahrani I.R., Sarsam A.I., Al-Omen M.M., (1966) "A Critical Analysis of Mitral Commissurotomy in Children and the Young." *International Surgery,* 45, 554.
2. Cherian G., Vythilingam K.I., Sukumar I.P., Gopinath N. (1964) "Mitral Valvotomy in Young Patients." *British Heart Journal,* 26, 157.
3. Goodwin J.G., Hunter J.D., Cleland W.P., Davies L.G., Steiner R.E., (1955) "Mitral Stenosis and Mitral Valvotomy." *British Medical Journal,* 2, 573.
4. Roy S.B., Bhatia M.L., Lazaro E.J., Ramalingaswami V., (1953) "Juvenile Mitral Stenosis in India." *The Lancet,* 2, 1193.
5. Sellors T.H., Bedford D.E, Somerville W., (1953) "Valvotomy in the Treatment of Mitral Stenosis." *British Medical Journal,* 2, 1059.
6. Sen P.K., Panday S.R., Parulkar G.B., Biswas P.K., (1966) "Mitral Stenosis in the Young." *Diseases of the Chest,* 49, 384.
7. a) Wood P. (1954) "Appreciation of Mitral Stenosis I." *British Medical Journal, 1, 1051.*

   b) Wood P. (1954) "Appreciation of Mitral Stenosis II." *British Medical Journal, 1, 1113.*

Primary abdominal pregnancy:

Review of the literature and a report of three cases

by R.K. Sinha
MBBS, MRCOG
Dept. of Obstetrics and Gynaecology,
University of Singapore,
Singapore.

Introduction:
THE ABILITY OF a fertilised human ovum to achieve primary nidation on any peritoneal surface was generally thought to be impossible until Studdiford (1942) established this concept. He reported a case where the implantation was on the serosa of the posterior aspect of the uterus and labelled it a primary implantation. He further laid down three criteria for making such a diagnosis which are generally accepted:

(1) Both tubes and ovaries must be normal, with no evidence of recent or remote injury.
(2) The absence of any utero-peritoneal fistulae.
(3) The presence of a pregnancy related exclusively to the peritoneal surface and young enough to eliminate the possibility of secondary implantation following a primary nidation in the tube.

Even Novak, who was at first dubious about the possibility of a primary peritoneal implantation, has accepted this concept after Studdiford's report. Moreover, he has also accepted several other cases from the older literature (Hirst and Knipe, 1908). The credit for reporting the earliest case must go to Gallabin who published his paper in the year 1896.

Theories on the mechanism of primary implantation

Studdiford believes that the ovum is expelled from the Graafian follicle and then becomes fertilised. The fertilised ovum develops over a period of eight to nine days without being captured by the fimbriated end of the Fallopian tube, and subsequently implants itself on either the parietal or the visceral peritoneum.

Regarding the mechanism of this phenomenon, it is thought that the basic defect is in the fimbrial or tubal function. Westman (1937) reviewed the normal mechanism by which the ovum is transferred to the tube, and mentioned the original work of Rouget (1858) who demonstrated muscle fibres in the tubo-ovarian ligament. On the basis of experimental work on rabbits and Macacus rhesus, Westman showed that these fibres are responsible for approximating the tube and ovary at the time of ovulation. The tube itself was found to undergo rhythmic motions with the fimbria sweeping over the ovary. A fluid current in the tube, which caused a sucking movement

towards the ostium, was also demonstrated. Westman maintained that the combined rhythmic action of the tube and cilial motion were responsible for this.

It is also suggested that chemotaxis plays a part in the guidance of the ovum into the tube. The nature of this chemotaxis is unknown, but it may be simply the favourable pH of the tubal secretions. Therefore theoretically any defect in these normal mechanisms can result in the phenomenon of primary peritoneal implantation. Iffy (1961) suggested that ectopic implantation follows coitus and conception at or about the time of menstruation. At this time, in the absence of normal sweeping movements of the fimbria and forward peristalsis of the Fallopian tube, it is possible that there is very little fluid current in the direction of the uterus, as a result of which the ovum is fertilised outside the tube.

Review of the literature

In reviewing the literature on primary abdominal pregnancy, only the early cases representing gestation periods of not more than eight to ten weeks have been included. This is done for the simple reason that only the early cases can satisfy Studdiford's criteria. The exact site of implantation in a moderately or well-advanced case of abdominal pregnancy is difficult or even impossible to determine due to extensive placental attachments. Also included in this review are cases reported before Studdiford laid down his criteria for primary abdominal pregnancy in 1942, since these are generally accepted as true instances of early primary nidation (Table 1).

Figures for the incidence of primary abdominal pregnancy are not available, though the incidence of abdominal pregnancy making no distinction between

TABLE I REVIEW OF THE LITERATURE

YEAR	AUTHORS	SITE OF IMPLANTATION
1896	Gallabin, A.D.	Pouch of Douglas
1908	Hirst, B.C. and Knipe, N.	Left broad ligament
1910	Hammacher, J.F.	Serosa of right Fallopian tube
1921	Ray, H.M.	Serosa anterior wall of uterus
1925	Meyer, J.	Serosa of uterus
1927	Maxwell, J.P. et al.	Serosa of left Fallopian tube
1942	Studdiford, W.E.	Serosa of uterus
1949	Burgeois, G.A.	Broad ligament
1950	Steptoe, P.	Left broad ligament
1954	Myles, J.J.M.	Serosa of uterus
1955	Ahnquist, G. and Lund, P.	Serosa of left Fallopian tube
1957	Martini, A.P.	Pouch of Douglas
1960	Iffy, L.	Pouch of Douglas
1961	Baccarini	Pelvic cavity
1961	Millar, W.G.	Pouch of Douglas
1961	Miller, A.P.	Pouch of Douglas
1964	Kemp, J.	Left lateral pelvic wall
		SITES OTHER THAN THE PELVIC CAVITY
1903	Witthauer, K.	Omentum
1912	Czyzewicz, A.	
1912	Richter, H.	
1918	Koehler, H.	
1919	Walker, J.	
1922	Jacquin, P.	
1924	Poten, W.	
1935	Nagel, V.	Spleen
1935	Longley, E.G.	Retroperitoneal space
1935	Lee, C.M.	
1937	Tomasi, L.	
1941	Williams, C.	
1945	Greene, G.G.	Lumbar gutter
1948	Elzey, N.D.	Lesser sac
1953	Van de Loo	Lower border of liver
1961	Tow, S.H.	Ileum. (Case referred to in text)

primary and secondary has been given variously quoted figures. Quilliam puts the incidence at 1:12,500 pregnancies of all types, and Dixon and Stewart (1960) state it as 1:930 during a period of six years in the University College Hospital in Jamaica. The deficiency of authoritative figures on the incidence of primary abdominal pregnancy may be attributed to the difficulty in determining the exact site of implantation, especially in the moderately advanced cases.

From the accompanying table, it will be noted that the sites of implantation of the fertilised ovum cannot be predicted with any certainty. Cases of primary implantation on the serosal surface of the pelvic organs, i.e. the uterus, tubes, broad ligaments, and on the peritoneal surfaces of the pouch of Douglas, uterovesical pouch and the lateral pelvic walls have been reported. Similarly, others have reported instances of primary nidation on the spleen, liver, omentum, lesser sac, etc. As would be expected, the pelvic peritoneal surfaces are most often the site of primary implantation by virtue of its physical proximity. Implantation in the more distant sites may be explained by the following:

(a) Late fertilisation of an ovum during which time it has had a chance to wander out of the pelvis.

(b) A fertilised ovum, which has not had a chance to implant on the pelvic peritoneum possibly because it got entrapped by the omentum or carried to the more distant sites by peristaltic movements of the gut.

Case Reports:

Three cases of early primary abdominal pregnancy were seen and treated in the University unit at the Kandang Kerbau Hospital in Singapore between September 1959 and July 1969. All three cases satisfy Studdiford's criteria, with gestation periods ranging from four to six weeks, the diagnosis being confirmed by histological examination.

Case No. 1

A Chinese woman, aged 35 years, para 4, was admitted on September 26th 1959 with severe abdominal pain of three hours' duration. The pain had started in the epigastrium and rapidly spread to the flanks. She fainted once at home and again on arrival at hospital. The last menses began on August 16th, 41 days before admission. Her periods were always regular three to four days every 28 to 30 days. Her last confinement was two years previously.

On examination, the patient was in a state of collapse. The blood pressure was 85/50 mm.Hg. and the pulse rate 120/min. The abdomen was very tender on palpation, and marked shifting dullness was present. The uterus was normal in size and position. The cervix, lateral and posterior fornices were tender. There were no adnexal masses. A diagnosis of ruptured ectopic pregnancy was made, and an immediate laparotomy, via a subumbilical mid-line incision, revealed the presence of three pints of blood and clots in the peritoneal cavity. The uterus, tubes and ovaries appeared healthy and there was a corpus luteum in the left ovary. As much blood as possible was removed, but more fresh blood seemed to be issuing from within the abdomen. The abdominal incision was extended upwards and a thorough search for the source of bleeding was carried out. The liver, spleen, and kidneys were intact. On examining the bowels, a haemorragic nodule 1.5 cm. in diameter on the ileum near its mesenteric border was found four feet from the ileo-caecal junction. A pulsating mesenteric artery was spurting blood from a small rupture in the nodule.

On close scrutiny, the nodule contained what appeared to be a small piece of placental tissue. The bleeding point was controlled and the raw area on the ileum repaired with an atraumatic suture. The patient was given three pints of blood. She made an uneventful recovery and returned home on the 8th day.

Histological Report:

Tissue on section showed area of blood clot and chorionic villi, Tow (1961).

Case No. 2

A 22-year-old Chinese woman, para 1, was admitted on 28th March 1965 with a history of slight 'cramp-like' lower abdominal pains and occasional giddiness on sitting up from the previous night. She also complained of pain on micturition for the same duration of time. Her last menses began on 1st March 1965.

On examination, her general condition was satisfactory. She had a blood pressure of 96/50 mm.Hg. and a pulse rate of 80/minute. There was some tenderness over the lower abdomen but no guarding, rebound tenderness, or presence of free fluid. Pelvic examination revealed a slightly bulky retroverted uterus with minimal tenderness in both lateral fornices.

She was observed closely in the ward and on the following day, her blood pressure was recorded as

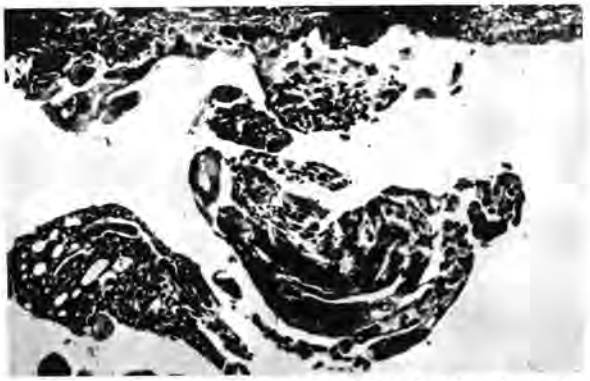


Fig. 1: Section shows masses of blood clot with chorionic villi.

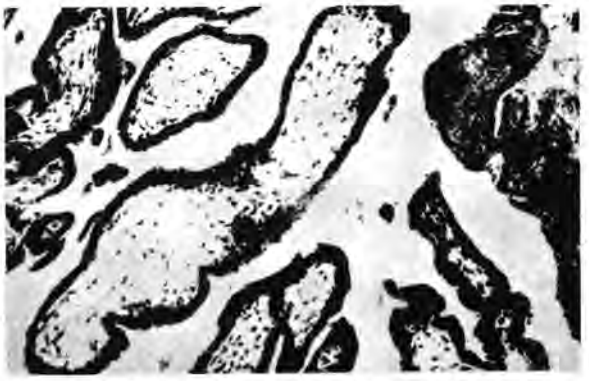


Fig. 2: Section shows presence of chorionic villi.

80/60 mm.Hg. and the pulse rate 112/minute. She also appeared pale, developed rebound tenderness over the abdomen and had signs of free fluid. Pelvic examination revealed a fulness in the pouch of Douglas.

A diagnosis of ruptured ectopic pregnancy was made and a laparotomy carried out. A massive haemoperitoneum of 2½ pints of blood and clot was found. The uterus, tubes and ovaries appeared normal. On evacuating the blood, a haemorrhagic mass 3 cm. x 2½ cm. x 1 cm. was detected, situated on the anterior leaf of the left-broad ligament just below the medial end of the round ligament. This mass was peeled off and the raw area repaired with atraumatic catgut. The abdomen was closed, and she was transfused with three pints of blood. She made an uneventful recovery.

Histological report:

'Microscopic examination of this haemorrhagic mass showed presence of blood clot and chorionic villi'. (Fig. 1)

Case No. 3

A 26-year-old Chinese woman, married for four months, was admitted on 30th April 1966 with a history of sudden onset of 'cramp-like' lower abdominal pains from the previous day. The pain originated in the left iliac fossa and spread to involve the entire lower abdomen. She fainted once at home. Her last menses began on 23rd March 1966. She had regular monthly periods.

On examination, she appeared pale, had a blood pressure of 110/70 mm.Hg. and a pulse of 88/minute. There was tenderness in the left iliac fossa and in the suprapubic region. Rebound tenderness was also present. Vaginal examination revealed a slightly enlarged uterus with tenderness in both fornices.

She was diagnosed as having a ruptured ectopic pregnancy and a laparotomy was carried out. One pint of blood was removed from the peritoneal cavity. The tubes, ovaries and uterus were normal. A haemorrhagic nodule attached to the peritoneum in the uterovesical pouch and bleeding was removed. This measured 1½ cm. in diameter. Haemostasis was secured with sutures, the abdomen closed, and a pint of blood transfused. She made a satisfactory recovery.

Histological report:

'Microscopic examination showed the presence of chorionic villi'. (Fig. 2).

Summary

Studdiford in 1942 established the concept of primary abdominal pregnancy, and his criteria for making such a diagnosis have been elaborated upon. Failure in tubal peristalsis, poor cilial action, and an unfavourable pH in the tubal secretions have all been incriminated in an attempt to explain this phenomenon.

A review of the literature has shown the site of implantation to be very variable. Three cases of primary abdominal implantation, presenting as ruptured ectopic pregnancies, are reported. All three cases satisfied Studdiford's criteria, final proof being obtained by histological examination of the conceptus.

Acknowledgement:

I wish to thank Dr. S.H. Tow, former Head of the Department of Obstetrics and Gynaecology, University of Singapore, and Dr. L.K.C. Chan, lecturer at the University of Singapore, Department of Obste-

trics and Gynaecology, for permission to report on their cases No. 1 and 2 respectively.

REFERENCES

1. AHNQUIST, G. and LUND, P.R. *Am. J. Obstet. Gynec.*, 69: 1268, (1955).
2. BURGEOSIS, G.A. Mil. Surgeon., 105: 243, (1949).
3. BACCARINI, A. *Med. J. Aust.*, 48: 898, (1961).
4. CZYZEWICZ, A. *Arch. Gynak.*, 97: 161, (1912).
5. DIXON, H.G. and STEWART, D.B. *Brit. Med. J.*, 21: 1103, (1960).
6. ELZEY, N.D. West. *J. Surg.*, 56: 410, (1948)
7. GALLABIN, A.L. *(Trans. Lond. Obst. Soc.* Vol. 5: 38) (1896). *Brit. Med. J.*, 1: 664, (1903).
8. GREENE, G.G. South. M.J., 38: 747, (1945).
9. HIRST, B.C. and KNIPE, N. *Surg. Gynec. and Obst.*, 7: 456, (1908).
10. HAMMACHER, J.F. *Arch. Gynak.*, 92: 595, (1910).
11. IFFY, L.J. *Obst. Gynec. Brit. Emp.*, 67: 997 (1960).
12. IFFY, L.J. *Obst. Gynec. Brit. Cwlth.*, 68: 441 (1961).
13. JACQUIN, P. *Gynec. et Obst.*, p. 492, (1922).
14. KOEHLER, H. Monatsschr. *Geburtsh. U. Gynak.*, 48: 83, (1918).
15. KEMP, J. *Med. J. Aust.*, 1: 120, (1964).
16. LONGLEY, E.G. *Am. J. Surg.*, 27: 349, (1935).
17. LEE, C.M. *Chinese M.J.*, 49: 789, (1935).
18. MEYER, J. *Zeutralbe. Gynak.*, 49: 118, (1925).
19. MAXWELL, J.P., EASTMAN, N.J. and SMETANA, *H. Surg. Gynec. and Obst.*, 45: 802, (1927).
20. MYLES, J.J.M. *J. Obstet. Gynec. Brit. Emp.*, 61: 387 (1954).
21. MARTINI, A.P. *Am. J. Obstet. Gynec.*, 73: 1139, (1957).
22. MILLAR, W.G. *J. Obstet. Gynec. Brit. Cwlth.*, 68: 634, (1961).
23. MILLER, A.P. *Canad. Med. Ass. J.*, 85: 755, (1961).
24. NAGEL, V. Monatsschr. *Geburtsh. U. Gynak.*, 101: 23, (1935).
25. NOVAK, E. Gynaecological and Obstetrical Pathology, ed. 3., Philadelphia, W.B. Saunders Co. p. 473, (1952).
26. POTEN, W. *Arch. Gynak.*, 122: 134, (1924).
27. QUILLIAM, T.A. *Post. Grad. M.J.*, 24: 482, (1948).
28. RICHTER, H. *Arch. Gynak.*, 96: 461, (1921).
29. RAY, H.M. *Surg. Gynec. and Obstet.*, 32: 437, (1921).
30. STUDDIFORD, W.E. *Am. J. Obstet. Gynec.*, 44: 487, (1942).
31. STEPTOE, P.J. *Obstet. Gynec. Brit. Emp.*, 57: 949, (1950).
32. TOMASI, L. *Abstract in Am. J. Obst. Gynec.*, 33: 306, (1937).
33. TOW, S.H. *Brit. Med. J.*, 2: 432, (1961).
34. VAN DE LOO, *G. Ztschr. Laryng. Rhin. Otol.*, 32: 514, (1953).
35. WITTHAUER, K. *Zentralbl. Gynak.*, 27: 136, (1903).
36. WALKER, J. *Arch. Gynak.*, 111: 342, (1919).
37. WESTMAN, A.J. *Obstet. Gynec. Brit. Emp.*, 44: 821, (1937).
38. WILLIAMS, *C. Med. J. Aust.*, 2: 326, (1941).

Some interesting dermatoses recently observed in Singapore

by C.H. Tay
AM, MB, MRCP (G)
Skin Clinic,
Medical Unit II,
Outram Road General Hospital,
Singapore 3.

(Paper read at the Physicians meeting, Southern branch, Malaysian Medical Association, General Hospital, Johore Bahru, on June 21, 1970.)

INTRODUCTION

CERTAIN DERMATOSES RARELY found in Singapore have been recently observed in increasing frequency. This observation reflects the changing pattern of skin diseases since the last survey from this clinic in 1954 (Khoo, 1954). Thus, for instance, dermatoses directly or indirectly caused by chemicals, drugs, cosmetics, industrial and household wares and many other synthetic substances have now emerged as one of the major skin problems in this country.

The change in the dermatological pattern is chiefly attributed to the general rise in the standards of living, rapid industrialisation, growing affluence and the increasing Western influence of our present society. Today, we see more cars on the road, more air-conditioners, radios, television sets and other modern amenities in the homes and in the offices, and there are widespread uses of various chemicals, drugs, medicated preparations and lately, contraceptive pills. More women are sporting the latest mini-skirts, wearing nylon-stockings and using a wide range of cosmetics.

The price of modernisation, as experienced in other advanced countries, is the increasing numbers of dermatoses arising from the uses, contacts or ingestion of the new products. These products can cause primary irritant dermatitis, allergic contact dermatitis, or other dermatoses from some systemic processes.

Although the problem is small at the moment, it is growing rapidly in dimension and the purpose of this paper is to inform the practising doctors of the recent trend in dermatological practice in Singapore.

Since most of the new skin diseases are fairly well-known to all of us, no further elaboration is needed. I shall only confine myself now to describing six interesing examples, all of which have been recently found in substantial numbers in our skin clinic at the Outram Road General Hospital. They are:

(1) "Nylon-stocking" dermatitis in a girl

wearing mini-skirts with nylon-stockings,
(2) "Cold urticaria" precipitated by the cool air of the air-conditioning plant,
(3) "Hair-spray" dermatitis,
(4) "Japanese" rubber slipper dermatitis,
(5) Chloasma from oral contraceptive pills, and
(6) "Dettol" dermatitis.

If time allows, I might even mention four other interesting examples of psychocutaneous disorders, which are the products of the stress and strain of modern living. The latter condition will form the subject of another paper (Tay, 1970).

(1) NYLON STOCKING DERMATITIS

A pretty Chinese waitress, aged 25, working in the air-conditioned bar of one of the leading Singapore hotels, was referred to our clinic as having intractable chronic neurodermatitis not responding to the usual dermatological treatment. Itchy rash had developed on both popliteal regions and the dorsum of both feet for the last six months, that is, soon after she commenced her present job. Pruritus was aggravated by excessive walking and relieved by resting, such as during the weekends and days off. There was no history of atopy, allergy or ingestion of drugs. In the interview, she did not mention any contact with nylon wears and she was not noticed to wear nylon stockings during the examination. Since her history suggested some relationship to her work, further questioning along this line revealed that she wore mini-skirt with nylon stockings provided by her employer when she was on duty. Even though the stockings were comfortable in the cool air conditioned atmosphere, she did notice that the material chaffed and irritated her skin, especially at the back of the knees and the front of the ankles. The rash was worse when the skin was moist and warm.

Examination showed lichenoid patches and diffuse maculopapular pigmented lesions on both popliteal spaces (Figure 1) as well as the dorsum of both feet. Other areas were unaffected. The margins of the lesions were ill-defined. Skin scrapings and cultures revealed no bacteria or fungal infections. Patch tests with her nylon stocking and the azo dyes (extracted from the nylon with hot ethanol) yielded positive results. She was asked either to change the brand of the stocking, or to use those that contained no azo-dyes, or not to wear them at all.

COMMENT

This girl represents the new breed of women working nowadays at offices, hotels and other places in Singapore, sporting the latest fashions and a number of them wearing mini-skirts with nylon stockings in the air conditioned rooms. Because of the warm weather and the cost, nylon stockings have never been popular in this country before, but the advent of the mini-skirt craze and the importation of low cost oriental stockings over the last few years have boosted the sales of these products. Inevitably, a small number of wearers became sensitised to the material after some length of time. In this girl, although the skin lesions are classical of the disease, the diagnosis was earlier missed due to the general unawareness of this condition in this country. This contact allergic dermatitis is not uncommon in Western countries and its typical distribution is shown in Figure 2. The azo-dyes of the stockings are often the sensitizers, and they may cross react with p-phenylenediame (PPD) and other related rubber chemicals (Calnan & Wilson, 1956; Cronin 1966). Cheaper stockings with darker shades are known to have surplus of these dyes but the expensive ones can also cause the dermatitis.

Fig. 1: **Nylon stocking dermatitis on both popliteal spaces.**

COLD URTICARIA

A 32-year-old dental surgeon complained of chronic urticaria on and off for two years. He first noticed the rash after working in the air conditioned surgery. One or two hours after exposure to the cold air, erythematous, itchy weals developed over the exposed parts of the body – face, neck, arms and feet – and the rash would soon subside after he left his office. He also noticed that the urticarial rash would reappear on re-exposing to the cold air of his air conditioned surgery or his bedroom. Later, even contact with cold water during a shower could precipitate the rash. Attempts to suppress the urtica-

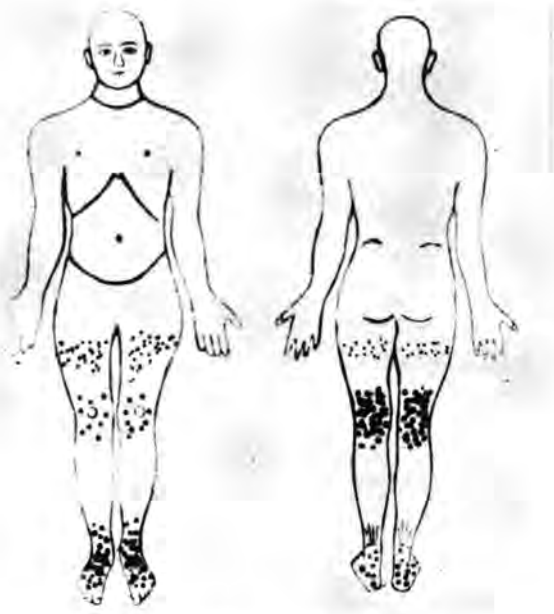


Fig. 2: **Typical distribution of skin lesions in nylon stocking dermatitis.**

ria with antihistamines and even small doses of steriods failed. He had to keep away from air conditioned rooms as well as from the cold air and other cold substances. He had no systemic diseases and was otherwise healthy. Family history of asthma and other known allergies was not obtained.

Clinically, he was found to be physically normal. Patch test with ice cube on the leg produced a large erythematous weal after 30 seconds, whereas no weal was found with a controlled subject (Figure 3). Investigations did not disclose any systemic disorders, such as malignancies, collagenosis, latent syphilis, cryoglobulinaemia or cryofibrinogenaemia. He was asked to desensitise himself with increasing amounts of cold water. With this treatment over a period of three months, he could later tolerate a moderate degree of cold air.

COMMENT

Cold urticaria is an uncommon dermatose and has been classified into four main causes (Miller et al., 1968).

(1) Cold haemolysin syndrome,
(2) Cryoglobulinaemia,
(3) Cryofibrinogenaemia, and
(4) Essential cold urticaria (cold allergy)

which is again subdivided into:

(a) congenital or familial, and

Fig. 3: **Patch test with ice-cubes 30 seconds later — "C" — Control subject showed no reaction, "P" — Patient with cold urticaria showed a positive reaction with large erythematous weal. Note the effect of the spill due to the ice-water running down the side of the arm.**

(b) acquired — which may be idiopathic or associated with acute illness or food allergy.

Our patient's illness is probably due to the idiopathic form of the essential cold urticaria, since the aetiology was unknown and other causes had been excluded. The disease could not have manifested itself had he not been exposed to the cold air conditioned air. A fair number of these conditions have recently been observed in Singapore and it is intriguing to know that this disease has often been unrecognised or was misdiagnosed because the skin lesions were delayed from 12 to 24 hours after contact or exposure. By then, the patient was no longer near the air conditioned surroundings. Therefore, it is essential to inquire into the history of exposure to cold air (air conditioned rooms or air-conditioned cars) in patients with chronic urticaria. The diagnosis can be readily confirmed by the patch tests with ice cube or exposure to cold air. This subject has been recently reviewed by Champion (1968) and Shafar (1965).

3. "HAIR-SPRAY" DERMATITIS

Miss K, an 18-year-old Malay housewife, bought an expensive imported brand of scented hair-spray set for quick re-set and to keep the hair in place. This hair-spray, which contained no lacquers or shellac, claimed to give lustre to the hair, to tame the wispy ends, and to leave the hair-waves shining, soft and staying in the desired style "even on the dampest days". After combing and arranging her hair, she gave it a generous spray, according to the instructions printed on the container.

By evening, her face and the exposed parts of her arms and the dorsum of her feet were warm, swollen

and tender. Later, widespread vesicles on swollen erythematous bases appeared on these areas, and she immediately sought hospitalisation.

Her face, especially the uncovered part of the lower face, was red, swollen with extensive vesiculation and had serious oozing (Figure 4). Moderate erythema with few blisters were present on the extensors of the forearms and arms. The dorsum of the feet were mildly affected. But the scalp, the forehead, the neck and the retro-auricular areas shaded by the hair, were not severely affected. All the other covered parts of the body, too, escaped. The border between the affected skin and the covered parts was sharply demarcated.

She suspected the hair-spray set of containing the offending allergen and it was brought to the hospital for investigation. It was then found that the moisture contained mostly lanolin and silicone as stated by the manufacturer. When the rash subsided in three to four days later, she yielded a positive patch test to lanolin, but not to silicone or other substances.

COMMENT

This is one of the many examples of new dermatoses due to imported cosmetics recently introduced. The contact (cosmetic) dermatitis in this case is due to airborne vaporised allergen which in this instance is lanolin. Typically, the exposed parts are diffusely affected and the rash stopped sharply over the covered areas, either by the hair or by the clothing. The lesions are more severe at the top where the concentration of the allergen is maximum, for example, face, and are relatviely mild at the bottom, that is, at the dorsum of the feet on standing. The distribution of the airborne hair-spray rash is therefore different from the contact allergic dermatitis due to hair perm or hair lotion. Lanolin is a known sensitiser in many cosmetic preparations. Fortunately, only 1% of those who use cosmetics products are sensitive to the substance. (Wells & Lobowe, 1964) The number of cases will definitely increase with the large numbers of consumers in this country.

4. "JAPANESE" SLIPPERS DERMATITIS

A 24-year-old Chinese factory worker, Miss T, had itchy rash on both feet for over six months. She had earlier tried various topical medicated creams without any relief. Her doctor thought that she had "Singapore feet" and was given anti-fungal drugs. No response was noted. On direct questioning, the rash appeared soon after she wore a new pair of "Japanese" rubber slippers.

Fig. 4: Hair spray dermatitis.

Dry, thickened and scaly lichenoid patches shaped like an inverted "V", with the apex at the junction of the big and the second toes, and found over the dorsum of both feet, corresponded to the rubber strappings of the slippers. (Figures 5 – 6) Several patchy lichenoid lesions were found above these lesions. The first interdigital webs and the opposing surfaces of the big and two toes were also affected, because of the contact with the base of the rubber strappings. No bacterial or fungal infections were demonstrated in these areas. Patch tests with chemical reagents like diphenylguanidine, p-aminophenol and 2-mercaptobensothiazole were positive.

COMMENT

"Japanese" rubber slippers have been popularly used in this country for many years as they are cheap, light and comfortable, especially for our warm and humid climate. Not all such slippers, however, are made in Japan as some are manufactured locally. The

Fig. 5: **"Japanese" rubber slipper dermatitis showing the chronic licheniod lesions on the dorsum of both feet.**

Fig. 6: **As in fig. 5 – showing the actual contact of the feet with the rubber strappings.**

increasing number of cases with contact allergic dermatitis to these slippers reflect the increasing numbers of wearers in the Republic, and the skin condition is probably one of the commonest form of rubber dermatitis. In contrast, the common causes of rubber dermatitis in Europe are rubber gloves (43%), rubber shoes and boots (10%), condoms (9%), brassieres and girdles (7%) and numerous other articles. (Wilson, 1969; Calnan and Sarkany, 1959; Cronin, 1966; Leider et al., 1952; Hindson, 1966). The commonest sensitisers are the thiuram accelerators (PTD, TMT), the mercaptobenzothiazole (MBT) and occasionally, the zinc diethyl dithiocarbamate (ZDC). The sensitisers in our "Japanese" rubber slippers are often due to the strappings and not the rest of the slippers. This is because the processing and rubber ingredients of the two components are different. However, cases sensitive to both parts had been seen, but these are rare.

5. CHLOASMA DUE TO ORAL CONTRACEPTIVE PILLS

Mrs. M, a 30-year-old Chinese housewife, was referred to the clinic because of increased pigmentation of the face for over six months. She had a child three years old, and for the past one year, she was taking oral contraceptive pills from the Family Planning Clinic in Singapore. At first, she thought the rash was freckles, but after some time, especially after exposure to sunlight, pigmentation became diffuse and spread to other parts of the face. There was no history of exposure to other drugs or chemicals and the patient had no known systemic disorders.

Chloasma-like pigmentation was seen over her face, but there were no pigmentations of the nipple, areolae and midline of the abdomen, thus differentiating it from the chloasma of pregnancy. The facial melanosis was symmetrical, blotchy, and mainly affected the cheeks, malar eminences, forehead, and lower lips (Figure 7). On the scalp margins, eyes and lips, a distinct margin was observed, but in other areas, the pigmentation faded imperceptibly into the normal skin.

COMMENT

"The pill" has recently been widely used in Singapore to control the population explosion. Two main types commonly used are:

(1) A synthetic oestrogen pill, combining

Fig. 7: Chloasma due to oral contraceptive pills.

Fig. 8: "Dettol" dermatitis – the rash corresponds to the area of the face which comes into contact with a fluid whilst drinking wtih a wide-brim glass.

with an active progestogen, and

(2) A sequential type of pills, involving the taking of an oestrogen for 15 days, followed by an oestrogen-progestogen combination for a further six days.

The adverse cutaneous reaction to oral contraceptive has been recently reviewed by Baker (1969) and Jackson (1968). Four main groups were classified:

(1) Cutaneous lesions stem from the pseudo-pregnancy state, that is, candidiasis, herpes gestations, cholestatic pruritus, and jaundice of pregnancy,

(2) Skin lesions from the hormonal side-effects, that is, chloasma, hirsuties, acneiform eruptions and alopecia,

(3) Skin lesions stem from hepatotoxicity of the drug and its affluence on cutaneous porphyria, and

(4) Miscellaneous effects, that is, erythema nodosum hypertrophic gingivitis, hidradenitis and so on.

Chloasma from "the pills" has been known for some time (Esoda, 1963; Resnik, 1967) and the progestational steriods are the usual offenders. Pigmentation may take a long period of time to develop and it often fades slowly, even on cessation of the drugs. Eight per cent of Puerto Rican and Mexican females developed this melanosis while on the "pill" but there may be racial differences (Cook et al., 1961; Rice-Wray et al., 1962). As seen in our patient, the pigmentation has a different distribution pattern from that caused by physiological pregnancy (Carruthers, 1966). Changing the drugs to the sequental type and avoidance of sunlight often help to reduce the discolouration. However, one has to be aware of other causes of facial melanosis in the differential diagnosis:– for example, those due to cosmetics, soaps, perfumes, drugs and other endocrine disorders.

6. "DETTOL" DERMATITIS

After a domestic quarrel with her husband, Mrs. T, a 23-year-old Chinese housewife, attempted suicide by drinking a large glassful of undiluted "Dettol" solution. She was rushed to the hospital where she

recovered after a careful stomach-washout.

Twelve hours later, darkish pigmentation with swelling, erythema and tenderness was found around the nose and the upper lip. This pigmentation corresponded exactly to the area of contact of the face with the irritant Dettol solution whilst drinking with a wide-brim glass. (Figure 8). She was treated with bland lotions and the rash cleared after three to four weeks.

COMMENT

This case demonstrates several interesting points. Dettol, an antiseptic and germicide (containing isopropyl alcohol, chloroxylenol and terponeol), has been extensively used in Singapore by most households for a great variety of conditions. This substance, as well as many other detergents, have recently replaced caustic soda as the commonest agents used for suicides in this country since the latter was prohibited for sale over five years ago. Over the same period of time, the suicide rates have also increased, a close reflection of the stress and strain of modern society. Without knowing the history of this patient, the unusual distribution of this primary irritant dermatitis could be extremely baffling indeed.

CONCLUSION

The six interesing dermatoses just described are but a few of the many new skin problems that we are facing in Singapore.

They underline the changing pattern of dermatology in the world of rapid progressive changes with strong Western influences. Every introduction of new legislation, new fashions, new cosmetics, new synthetic products and so on, are often accompanied by their drawbacks, and in this instance, the appearance of new dermatoses. Fortunately, the numbers of sufferers are small in comparison to the size of the consumers' market. These six cases, therefore, should serve to alert one to the increasing frequency of current dermatoses observed in present day practice. They also demonstrate how these conditions could easily be misdiagnosed and mismanaged if the doctor is unaware of the recent dermatological pattern.

REFERENCES

Barker, H. (1969) : Drug Reactions VIII, Adverse Reactions to Oral Contraceptives. *Brit. J. Derm.* Vol. 81:946.

Calnan, C.D. & Wilson, H.T.H. (1956) : Nylon Stocking Dermatitis. *Brit. Med. J.* 1:147.

Calnan, C.D. & Sarkary I (1959) : Studies in Contact Dermatitis. Trans. a. *Rep. St. John's Hosp. Derm. Soci. Lond.* 43:8.

Carruthers, R. (1966) : Chloasma and Oral Contraceptives. *Med. J. Aust.* 2:17.

Champion, R.H. (1968) : Cutaneous Reactions to Cold. In Text Book of Dermatology, Ed. Book, A., Wilkinson, D.S. Ebling, F.J.G. Vol. 1:334. Blackwell Scien. Public Oxford and Edinburgh.

Cook, H.H., Gamble, C.J. & Salterthwait, A.P. (1961) : Oral Contraceptives by Nosethynodsel. *Am. J. Obstet. Gynec.* 82:437.

Cronin, E. (1966) : Shoe Dermatitis. *Brit. J. Derm.* 78:617.

Esoda, E.C.J. (1963) : Chloasma from Progestational Oral Contraceptives. *Arch. Derm.* 87:486.

Hindson, T.C., (1966), Studies in Contact Dermatitis, XVI Contraceptives. Tran. *St. John's Derm. Soc. Lond.* 52:1

Jackson, I. : (1968), The oral contraceptives. *Prescrib. J.* 8:22.

Khoo, O.T., : (1954), A survey of skin diseases in Singapore. *Proc. Almin. Assos. Malaya* 7:18.

Miller, D.A., Freeman, G.L., & Akers, W.A., : (1968), Chronic urticaria – a clinical study of 50 patients. *Amer. J. Medicine.* 44:68.

Resnik, S. : (1967), Melasma induced by oral contraceptive drugs. *J. Amer. Med. Ass.* 199:601.

Rice-Wary, E., Schultz-Contreras, M., Guessera, I., & Aranda-Roswell, A., : (1962), Long-term adminstration of Norethindrone in fertility control. *J. Amer. Med. Ass.* 180:355.

Rook, A., : (1968), In Textbook of dermatology, Ed. Rook A., Wilkinson, D.S., & Ebling, F.J.G. Vol. i.

Shafar, J., (1965), Cold hypersensitivity states. *Lancet* 2: 431.

Tay, C.H., (1970) , Psychocutaneous disorders. *Med. J. Malaya – in preparation.*

Wells, F.V., & Lubowe, I.I., (1964), Cosmetics and the Skin. New York. Reinhold.

Wilson, H.T.H., : (1969), Rubber dermatitis – an investigation of 106 cases of contact dermatitis caused by rubber. *Brit. J. Derm.* 81:175.

The modern treatment of Bartholin cyst and abscess

by K.H. Ng

FRCS, MRCOG

Lecturer in Obstetrics and Gynaecology,
University of Malaya,
Kuala Lumpur.

IN THE PAST, the method of treatment recommended in most gynaecological text-books for a Bartholin's cyst was primary excision, and an acute abscess by incision and drainage, followed later by excision. Difficulties are often encountered in these conventional methods and complications following such procedures are not uncommon. It is therefore not surprising that an improved method of treatment has evolved in recent years.

The first account of the marsupialisation operation was given by Davies in 1948. Modifications of the surgical technique were described by Jacobson in 1950 and Wilder in 1955. The first account to appear in British literature was that by Blakey in 1958, and more recently by Siganos in 1961. Long-term results were reported by Blakey et al, (1966) and Mathews (1966) confirming that results were satisfactory following this new technique.

Material and Methods

The Bartholin cyst is a dilation of the 2-centimetre long duct due to blockage at its distal end where it opens into the vagina. The aim of the operation is to construct a new mucocutaneous junction between the cyst wall and the labial skin and to place it in approximately the normal position so that the secretion will be released on the vulva. The same operation is done whether the cyst is infected or not, ruptured or recurrent.

The technique employed is essentially similar to Blakey's (1958). A vertical incision 2 cm. long is made directly into the cyst as in Fig. 1. The lining of the cyst is sutured to each adjacent cut skin margin, using about six interrupted catgut sutures, vide Fig. 2.

During a three-year period at Saint Mary's Hospital, Manchester, and at Whittington Hospital, London, the author marsupialised 18 Bartholin cysts and seven abscesses. The results were satisfactory. No complications were encountered and no recurrence during the short follow-up.

Technique and Results of Various Authors

Davies (1948) was the first to describe this simple method for restoring the Bartholin cyst to function. He treated 25 Bartholin cysts by incision under local anaesthesia. The cavity was packed with iodoform gauze which was changed biweekly for three weeks to maintain patent the new ostium in the duct. Occasionally, the ostium contracted and it had to be dilated up with a blunt instrument.

In 1950, Jacobson reported on the results of operating on 19 Bartholin cysts, five of which were recurrent. The cyst was incised and the cut edge of the cyst was sutured to that of the labia forming a new stoma for the gland. These results were excellent.

While Davies and Jacobson treated the Bartholin cyst only, Wilder in 1955 described a modified

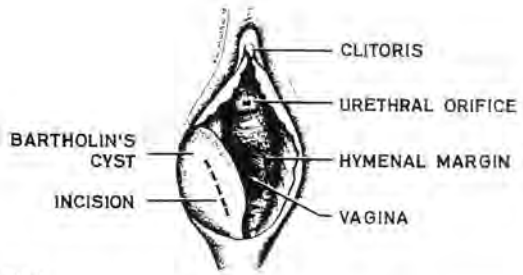


Fig. 1

LINEAR INCISION MADE JUST OUTSIDE HYMENAL RING.

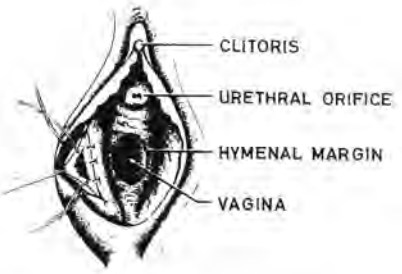


Fig. 2

THE EDGES OF CYST WALL ARE SUTURED TO THE SURROUNDING SKIN AND MUCOUS MEMBRANE.

method whereby the cyst and the abscess were treated similarly under local anaesthesia. An incision about 2 cm. long was made over the cyst wall or abscess. The cut cyst edge was sutured to the adjacent skin edge with four or five interrupted silk sutures which were removed after three weeks. An iodoform drain was inserted for a week. He treated 48 abscesses and 32 cysts with good results.

In 1956, Tancer et al reported on marsupialisation of 22 Bartholin cysts without a single recurrence. A linear incision was made into the cyst cavity. An elliptical portion of the cyst lining was excised and a stoma 1 to 1.5 cm. in diameter created.

Blakey (1958) described a slightly modified technique for treating the cyst and the abscess, as indicated above under "Material and Methods." After-care consisted of simple hygiene and daily baths. The operation may be done under general or regional anaesthesia, as an outpatient procedure, and may even be performed during pregnancy. He operated upon 14 cysts and abscesses and the results were satisfactory.

Lowrie (1959) modified Jacobson's method by packing the cavity with a small piece of rubber drain which was held by a suture. He treated 60 cysts and abscesses and "failure was relatively unknown."

In 1960, Jacobson further reported on 140 patients with 152 cysts which were marsupialised, using the same technique he described in 1950. "The results were excellent in all cases."

Oliphant et al, (1960) reviewed 380 cases of cysts and abscesses which were treated by various techniques such as medical treatment, needle aspiration, incision and drainage, and marsupialisation. Marsupilaisation was followed by the lowest recurrence rate.

In 1961, Siganos reported on ten cases of Bartholin cysts and two cases of Bartholin abscesses treated by marsupialisation with complete success.

Johnson (1961) described marsupialisation of the Bartholin cyst under pudendal anaesthesia. The technique was similar to Blakey's (1958). He operated upon 45 patients with only one known recurrence.

The long-term results after marsupialisation of cysts and abscesses were reported by Blakey et al (1966) and by Mathews (1966). Blakey et al reported two recurrences, following marsupialisation of 29 abscesses and 21 cysts, and after a follow-up of two to eight years. In Mathews' series, recurrences are known to have occurred after 15 (13 per cent) of 115 marsupialisation operations.

Disadvantages of Excision

Excision of the cyst is not a simple operation and it should be done in hospital. Haemorrhage and haemotoma formations are common because of the vascularity in this area of the vulva. A large depression may be left on the vulva following excision (Crossen and Crossen, 1948).

In the excision operation, the perineum is deprived of an important secretion. Jacobson (1950) described a woman who had both glands removed; three months later, she complained of dyspareunia and pruritus vulva.

Damage to surrounding structures can be serious complications. Te Linde (1962) stated that the rectum may be damaged during excision of the cyst, and one may encounter troublesome bleeding. Reich and Nechtow (1957) commented that "excision appears to be the bloodiest procedure in gynaecological surgery," while Wilder (1955) had seen many

cases requiring blood transfusions with prolonged stay in hospital.

The recurrence rate following the excision operation is high, and this is the experience of most authors. Blakey (1958) commented that recurrence may follow excision of the cyst if the gland is left behind.

Although Novak (1951) did not favour the marsupialisation operation, he agreed that tender, irritating scars may follow the excision operation.

Oliphant (1960) objected to the excision operation because it could be time-consuming, and it could not be employed on the acute abscess.

The excision operation is not feasible when the cyst has ruptured through or under the skin. If excision had failed then scarring and loss of anatomical landmarks would render succeeding operations more difficult.

Advantages of Marsupialisation

These may be summarised below:

(1) The procedure is simple.
(2) Operating time is short.
(3) Blood loss is minimal.
(4) The mucous secreting function of the gland is preserved.
(5) Little risk of injuries to surrounding structures.
(6) Little or no post-operative discomfort or morbidity.
(7) No tender post-operative scar.
(8) The procedure is applicable to both cysts and abscesses.
(9) Hospital stay is shortened.

Conclusion

In view of the disadvantages from excision of the Bartholin cyst compared to the advantages of the marsupialisation operation, there is a recent trend towards adopting the marsupialisation to technique for treating the Bartholin cyst and abscess. The procedure is simple and can be easily mastered by junior resident doctors. Complications and recurrence are minimal. Hence this modern technique should supercede the older methods of treating Bartholin cysts and abscesses.

Acknowledgements

I wish to thank the consultants at St. Mary's Hospital, Manchester, and Whittington Hospital, London, for allowing me to study these cases, and to the Department of Medical Illustration, University of Malaya, for help with the diagrams.

REFERENCES

1. Blakey, D.H. – *J. Obst. & Gyn. Brit. Emp.* 65:800, 1958.
2. Blakey, D.H. – *J. Obst. & Gyn. Brit. Commw.* 73:1008, 1966.
3. Crossen, H.S. & Crossen, R.J. – *Operative Gynaecology*, 1948.
4. Davies, J.W. – *Surg. Gyn. & Obst.* 86:329, 1948.
5. Jacobson, P. – *West. J. Surg. Obst. & Gyn.* 58:704, 1950.
6. Jacobson, P. – *Am. J. Obst. & Gyn.* 79:73, 1960.
7. Johnson, W.D. – *Obstet. & Gynec.* 18:277, 1961.
8. Lowrie, R.J. – *South African M.J.* 33:834, 1959.
9. Mathews, D. – *J. Obst. & Gyn. Brit. Commw.* 73:1010, 1966.
10. Novak, E. – *Obst. & Gyn. Surv.* 6:553, 1951.
11. Oliphant M.M. & Anderson, G. – *Obstet. & Gynec.* 16:476, 1960.
12. Reich, W.J. & Nechtow, M.T. – *Pract. Gynaecology*, 1957.
13. Siganos, E. Ch. – *B.M.J.* 11:995, 1961.
14. Tancer, M.L. et al. – *Obstet. & Gynec.* 7:608, 1956.
15. Te Linde, R.W. – *Operative Gynaecology*, page 736, 1962.
16. Wilder, E.M. – *Southern Med. J.* 48:460, 1955.

Recurrence of influenza with A_2/Hong Kong/68 within two months

by
Sumitra Kamath
Mohamed Omar
and
Lim Teong Wah

Institute for Medical Research, Kuala Lumpur.

Abstract

A CASE REPORT of two influenza-like illnesses in the same person, within two months, where a diagnosis by virus isolation from throat swabs on both occasions was A_2/Hong Kong/68. Only the second illness was confirmed serologically by H.I. and C.F. as no blood was collected during the first illness. Previously, the earliest reported interval between natural reinfection with the same strain was two years.

Introduction

Repeated illness with influenza in any selected population is certainly not rare, but has nearly always been accounted for by a major or minor change in antigenic composition of the offending strain. (1) Natural reinfection of an individual with the same or closely related strain has been described but with minimum time intervals of at least two to three years between illnesses (1, 2, 3). It is the purpose of this article to report positive virus isolations (A_2/Hong Kong/68-like strains) from the same individual during the onset of two influenza-like episodes of illness with a time interval between them of only two months.

Case Report

First Illness

A 29-year-old female laboratory worker had a sudden onset of fever, malaise, chilliness, myalgia and arthralgia on 19th July, 1968. On examination the next day, the temperature was 103°F, throat congested, and conjunctivae – injected but there were no other significant findings. The fever subsided two days later but she now complained of cough, wheezing and retrosternal soreness. Because of a previous history of pneumonia following influenza in 1957, she was started on ampicillin 250 mg six hourly, together with bronchodilators. The wheezing subsided in a week but the cough persisted for another two weeks. A throat swab labelled F9/68 was collected on Day Two of the illness.

Second Illness

On 14th September 1968 – almost two months later – while she was working in the laboratory with influenza specimens collected during the 1968 influenza epidemic with the A_2/Hong Kong/68 strain, she again contracted a similar illness. She was now pregnant at six weeks gestation. This time the maximum temperature was 102° and cough and wheezing developed the next day. She developed status asthmaticus three days later. She was again

treated as before. Convalescence was prolonged and complicated by asthmatic bronchitis. She became asymptomatic, however, in about eight weeks. On 4th May, 1969, she was delivered of an apparently normal 6 lb. 9 oz. infant boy. A throat swab, labelled F221/68, and an acute specimen of blood was collected on Day One of the illness. A second blood sample was collected 17 days later and a third sample on 25th November 1968 – almost two months later.

Material & methods

Virus Isolations

Throat swabs were collected by touching the posterior pharynx with a dry swab immediately after asking the patient to cough. They were placed in sterile tubes containing 2 ml. of bacteriological broth and this was stored at –70°C till processed. Before inoculation into eggs, penicillin and streptomycin were added to the specimen to yield a final concentration of 625 units and 125 ugms per ml. respectively. Viruses were isolated in 9–11 day-old embryonated eggs following standard procedures (4). When the eggs were negative in a spot haemagglutination test two blind passages were carried out. F9/68 and F221/68 were processed on 20th July, 1968 and 14th September 1968 respectively. In both instances, agents were isolated and labelled as A_2/Malaysia/9/68 and A_2/Malaysia/221/68 respectively. Agents were reisolated successfully from the original specimens on the 8th and 14th April 1969.

Virus Identification

Identification of isolates was by means of cross-haemagglutination-inhibition tests (H.I.) employing allantoic fluid antigens of the isolates labelled A_2/Malaysia/9/68 and A_2/Malaysia/221/68 and the prototype strain A_2/Hong Kong/1/68. Other antigens included in the test were A_2/Taiwan/1/64, B/Switzerland/265/67 and B/Singapore/3/64. The antisera were A_2 Polyvalent, B Polyvalent, antisera against the isolates and A_2/Taiwan/1/64. The A_2/Taiwan/1/64 antigen and the A_2 and B polyvalent antisera were supplied in the W.H.O. influenza kit in 1969 by the Influenza Centre for the Americas, National Communicable Disease Centre, Atlanta, Georgia, U.S.A. The B/Singapore/3/64 virus was obtained from the Department of Bacteriology, University of Malaya, Singapore. The A_2/Hong Kong/1/68 prototype strain and A_2/Hong Kong/124/68 antisera were kindly sent to us by Dr. W.K. Chang, Government Virus Unit, Queen Mary's Hospital, Hongkong; the B/Switzerland/265/67 virus was sent by Dr. H.G. Pereira, WHO Influenza Reference Centre, Mill Hill, London.

The method of the HI test and chicken antisera preparation against our isolates and rabbit antisera against B/Singapore/3/64 A_2/Taiwan/1/64 was essentially that recommended by the subcommittee on diagnostic procedures for viral and rickettsial diseases (4) except that WHO perspex plates instead of tubes and eight HA units of antigen were used. Initial serum dilutions were 1:20 and the titre of H.I. antibody was expressed as the reciprocal of the highest dilution of serum which inhibited agglutination of red cells.

Serology

Blood was collected by venepuncture on Days 2 and 17, 2½ months and a year after the onset of the second illness and was allowed to clot at room temperature. Sera were separated and stored at –20°C till processed. They were tested simultaneously against the two isolates – A_2/Malaysia/9/68 and A_2/Malaysia/221/68 – A_2/Hong Kong/1/68, A_2/Taiwan/1/64 and B/Singapore/3/69 antigens by H.I. All sera tested by H.I. were treated by receptor-destroying-enzyme for removal of non-specific inhibitors. Initial serum dilutions were 1/10 for serology. The complement fixation test (C.F.) was done by the California State Health Department Virus Laboratory at San Francisco.

Result

Table 1 shows that both A_2/Malaysia/9/68 and A_2/Malaysia/221/68 belong to type A_2 because of high H.I. titres with A_2 polyvalent and negative reactions with B polyvalent antisera. They most closely resemble A_2/Hong Kong/68 giving identical titres with its antiserum. This was confirmed by Dr. Marion Coleman of the National Communicable Diseases Centre, Atlanta, Georgia, U.S.A. Cross-HI test with their antisera also confirm the close antigenic similarity of the two strains isolated from the patient. The formula of Archetti & Horsfall, which is a measure of antigenic similarity between two strains, is given as:

$$r = \sqrt{r_1 \times r_2} \text{ where}$$

$$r_1 = \frac{\text{heterologous titre of virus 2}}{\text{homologous titre of virus 1}}$$

$$r_2 = \frac{\text{heterologous titre of virus 1}}{\text{homologous titre of virus 2}}$$

When r = 1, it indicates no antigenic difference and any value of $\frac{1}{r}$ 2 is significant for antigenic dissimi-

Table 1

IDENTIFICATION OF ISOLATES BY H.I. TEST

ANTIGENS	ANTISERA					
	A_2/POLYVALENT	B POLYVALENT	A_2/HONG KONG/24/68	A_2/MALAYSIA/9/68	A_2/MALAYSIA/221/68	A_2/TAIWAN/1/64
A_2/HONG KONG/1/68	1280	< 20	1280	160	320	10
A_2/MALAYSIA/9/68	1280	<20	640	160	160	<10
A_2/MALAYSIA/221/68	1280	<20	640	160	320	< 10
A_2/TAIWAN/1/64	1280	<20	40	<20	<20	320
B/SWITZERLAND/265/67	<20	320	<20	<20	<20	–
B/SINGAPORE/3/64	<20	640	<20	<20	<20	–

larity (5). When applied to A_2/Malaysia/9/68 and A_2/Malaysia/221/68, $\frac{1}{r} = 1.4$. When either of the isolates are compared with A_2/Hong Kong/68, a value of $\frac{1}{r} = 1.4$ is also obtained. Serological results show an absence of HI antibody against either of the two isolates and A_2/Hong Kong/1/68 and minimal titre of ten for A_2/Taiwan/1/64 in the acute specimen for the second illness and a greater than four-fold rise against all four strains in the two convalescent serum samples with no significant lowering one year later (see Table 2). The CF test indicated a four-fold rise of antibodies for the second illness.

Discussion

Presented here are two episodes of influenza-like illness in the same individual within a remarkably short time of two months where the etiological diagnosis by virus isolation was A_2/Hong Kong/68. The second illnes was confirmed by a four-fold or greater rise of both CF and HI antibodies. A serological confirmation of the first illness could not be done as appropriate blood samples were not collected. Table 2, however, shows that two months later, at the onset of the second illness, there were no demonstrable HI antibodies against A_2/Malaysia/9/68. This could mean either that A_2/Malaysia/9/68 did not stimulate the production of any HI antibodies, (or that they could not be measured in the HI test) or they had not persisted for two months. Alternatively, A_2/Malaysia/9/68 might not be a valid isolate, and the first illness might not be influenza. It is probably valid because a throat-swab, from which virus was isolated, was collected during an influenza-like illness at the beginning of the 1968 influenza epidemic with A_2/Hong Kong/68 strains and it was reisolated from the original throat swab material in April 1969. Besides, there were reports in the literature when serology by H.I. or C.F. or both have been negative in cases with positive throat swabs (6, 7).

TABLE 2

SEROLOGY

HAEMAGGLUTINATION – INHIBITION TEST

Sera	Date of collection	ANTIGENS				
		A_2/HONG KONG/1/68	A_2/MALAYSIA/9/68	A_2/MALAYSIA/221/68	B/SINGAPORE/3/64	A_2/TAIWAN/1/64
VR 25152	14th September 1968	< 10	< 10	< 10	< 10	10
VR 25260	1st October, 1968	640	640	640	< 10	320
VR 25506	25th November, 1968	640	320	640	< 10	320
VR 26426	September, 1969	320	320	320	–	160

TABLE 3

SEROLOGY

COMPLEMENT FIXATION TEST WITH INFLUENZA-A

Sera	Date of Collection	Titre
VR 25152	14th September 1968	16
VR 25260	1st October, 1968	64
VR 25506	25th November, 1968	64

The chance that the second illness was a laboratory infection is great because the patient had been handling isolates from the 1968 epidemic in the week prior to the illness. The infecting dose of virus may thus have been larger than normal. In any case, the immunity was low in the face of challenge with the same virus. Except for the episode of pneumonia following Asian influenza in 1957, the patient has not exhibited unusual susceptibility to infection. Her Hb electrophoresis revealed Hb. A and results of total serum proteins and serum protein electrophoresis were normal. Her blood group is A. Tyrrell, Sparrow and Beare, who studied the relationship between blood groups and resistance to infection with influenza in human volunteers, found a greater proportion of those with blood group O became infected than those with blood group A.

Experimental studies in man have shown that four months after the induction of clinical influenza by inhalation of type B virus, when 24 of the same people were re-exposed to the same strain, they had clinical disease evidenced by fever in 21, symptoms in nine and serological responses in eight out of the 24 people. (9) Similar results were reported by Henle et al with influenza type A (10) in which inhalation of a second dose nine months following convalescence from the experimental disease by the same strain of virus resulted in symptoms and fever in five out of nine individuals. The anitbody titre of these five subjects had returned to the low pre-exposure level during the interval between the first and second exposure. A second natural illness with type A has also been described (2, 3) but the strains were at best only closely similar.

Studies of the effect of influenza on pregnancy and the unborn foetus have produced conflicting results (11, 12, 13, 14). In this patient, the pregnancy was uncomplicated and terminated spontaneously at term with the birth of a normal baby.

Summary

A case report of a reinfection with A /Hong Kong/68-like influenza virus within two months is presented. This occurred in a patient in the first trimester of pregnancy who delivered an apparently normal baby.

Acknowledgement

To the Director of Medical Services, West Malaysia, and the Director, Institute for Medical Research, Kuala Lumpur. Malaysia, for permission to publish; to Dr. Charles Davis, of the Department of Internal Medicine, University of California, San Diego, California, for reading the manuscript; to the California State Virus Laboratory, San Francisco, for the CF test; and to Mr. Ali bin Amin for technical assistance.

References:

1. Jordon, W.S. Jr., Badger, G.F. and Dingle, J.H. (1958) – A study of illness in a group of Cleveland families. XVI Epidemiology of Influenza, 1948–1953. *Amer. Jour. Hyg., 68, 169–189.*
2. Jordon, W.S. Jr., Denny, F.W. Jr., Badger, G.F., Curtiss, C., Dingle, J.H., Oseasohn, R., and Stevens, D.A. (1958) – A study of illness in a group of Cleveland families. XVIII. The occurrence of Asian influenza. *Amer. Jour. Hyg.,* 68, 190–212.
3. Sigel, M.M., Kitts, A.W., Light, A.B., and Henle, W. (1950) – The recurrence of influenza A-Prime in a boarding school after two years. *Jour. Immunology,* 64, 33–38.
4. Diagnostic Procedures for Viral and Rickettsial Diseases. 3rd Edition Edited by Lennette E.H., and Schmidt, N.J.
5. Archetti, I., and Horsfall, F.L. Jr. (1950) – Persistent antigenic variation of influenza-A viruses after incomplete neutralisation in ovo with Heterologous immune serum. *Jour. of Exper. Med.* 92, 441–462.
6. Kalter, S.S., Casey, H.L., Jensen, K.E., Robinson, R.Q., and Gorrie, R.H., (1959) – Evaluation of laboratory Diagnostic Procedures with A/Asian Influenza. *Proc. Soc. Exp. Biol. and Med.* 100, 367–370.
7. Jao R.L., Wheelock, E.F., and Jackson, G.G., Production of interferon in volunteers infected with Asian Influenza. *J. Inf. Disease.* (1970) 121, 419–425.
8. Tyrrell, D.A.J., Sparrow P., Beare, A.S., (1968) – Relation between blood groups and resistance to infection with influenza and some picorna viruses. *Nature* 220, 819–822.
9. Francis, T. Jr., Pearson, H.E., Salk, J.E., and Brown, P.B. (1944) – Immunity in human subjects artificially infected with influenza virus, type B., *Amer. Jour. Public Health* 34, 317–334.
10. Henle, W., Henle, G., Stokes, J. Jr., and Maris, E.P. (1946) – Experimental exposure of human subjects and viruses of influenza, *J. Immunol.* 52, 145–165.
11. Widelock, D., Csizmas, L., and Klein, S., (1963) – Influenza Pregnancy, and Fetal outcome. *Public Health Reports,* 78, 1–10.
12. Coffey, V.P., Jessop, W.J.E. (1959) – Maternal influenza and congenital deformities. A prospective study. *Lancet* 2, 935.
13. Cambell, W.A.B. (1953) – Influenza in early pregnancy. Effects on the foetus. *Lancet,* 1, 173.
14. Wilson, M.G. and Stern, A.M., (1969) – Teratogenic effects of Asian Influenza. An extended study. *J.A.M.A.* 210, 336–337.

Bites and stings by venomous animals with special reference to snake bites in West Malaysia

by

B.L. Lim

Head,
Division of Medical Ecology,
Institute for Medical Research,
Kuala Lumpur.

and

Abu Bakar bin Ibrahim

Director,
Institute for Medical Research,
Kuala Lumpur.

BITES AND STINGS of venomous animals of West Malaysia are common and a number of fatal cases due to snake-bites have been reported from time to time. Most of these bites are attributed to venomous snakes but other venomous animals, such as scorpions, centipedes, spiders, bees, wasps and marine vertebrates and invertebrates, have also contributed to the numbers of cases of toxicity in West Malaysia.

Fortunately, the venomous snakes constitute only 10% of the snake fauna, of which only half are considered dangerous to man. Even dangerously venomous snakes seldom inject a lethal dose of venom in a defensive bite. Stings and bites by most of the other venomous animals are unlikely to kill unless they are multiple or hypersensitivity exists. Unlike in some other Southeast Asian countries, where venomous animals are a constant hazard and fatality rates are alarmingly high (Swaroop and Grab, 1954), the numbers of fatal cases of toxicity due to snake-bites and bites and stings by other venomous animals in this country are much less formidable.

The very low mortality rates in West Malaysia may be attributed partly to availability of antivenin for treatment of most snake-bites and partly because the bites of most venomous snakes, like the vipers, are seldom fatal even in the absence of proper treatment.

The present paper deals with the distribution and observations of the habits of most of the venomous snakes of West Malaysia. Data on bites and stings from other venomous animals in the 11 states of West Malaysia for the period 1960–1968 are also presented, giving the number of cases and the mortality rates.

MATERIALS AND METHODS

Venomous and harmless snakes were collected throughout Malaysia in connection with bio-medical studies of the vertebrate hosts of zoonotic diseases. During the periods from 1948 to 1969, 3,457 specimens of land snakes, including each of the venomous species, were examined.

Stomach contents of most of these snakes were also examined and, whenever possible, the contents were identified.

Data on patients inflicted with snake-bites and stings from other venomous animals were obtained from the Ministry of Health, Kuala Lumpur, Malaysia.

RESULTS

Identifications of the venomous land snakes are already adequately described in "Snakes of Malaya"

by Tweedie (1957). The main differences useful in identifying venomous and harmless snakes are illustrated in the "Snake Chart" (Appendix 1).

COBRAS

Two species of cobras are found in West Malaysia. The King Cobra or Hamadryad **(Ophiophagus hannah)** is more active in the day than at night. The Common Cobra **(Naja naja)** is mainly nocturnal. Both these snakes are widely distributed throughout the country.

The King Cobra is common in the lowlands but rare in hilly places, and, on islands (Table 2). It is usually found in primary and secondary forests and in oil palm estates but uncommon in the open fields and rubber estates (Table 1). It feeds exclusively on reptiles, such as lizards and other snakes. Being cannibalistic in its behaviour, this snake has been found to have victims of its own species in its stomach contents (Table 3).

Tweedie (1941) gave an interesting account attesting to the unaggressiveness of this snake. His findings were later confirmed by us. The first time was in 1953 when we were inspecting rodent traps near a forest path at Sungei Buloh Forest Reserve, 14 miles northwest of Kuala Lumpur.

A trap was laid near a palm tree just by the edge of a large forest stream and while checking the trap, one member of the team happened to throw a stick into the palm tree. The stick must have hit the snakes and much to our surprise, we were suddenly confronted with two expanded hoods raised about three feet high in the middle of the palm tree.

Both snakes were hissing loudly, but made no attempt to attack. We immediately retreated and in trying to go across to the other side of the stream by the wooden bridge, two of us fell into the water. Under these circumstances, if the snakes were aggressive, as is assumed by many people, they would have attacked. Instead, they moved slowly away from the palm tree. When we went back to retrieve the trap (with a rat in it), we saw a brood of eggs in the nest. It was, therefore, quite obvious that the two snakes had been there for quite some time and despite the fact that we had been tramping in and out through the path, no attempt was made by them to attack us earlier, which indicates that the King Cobra is not aggressive unless, perhaps, unduly provoked. When we visited the area again the following day, we could see from the other side of the stream that the snakes had returned to their nest.

The second occasion was in 1956 in the Ampang Reservoir Forest, six miles east of Kuala Lumpur. This time we came across a King Cobra in the middle of a jungle path. The snake rose up to a height of about three to four feet, but made no attempt to attack as we retreated. It soon wriggled its way into the thicket and we were left to carry on with our work.

Fig. 1: King Cobra, *Ophiophagus hannah*. The expanded hood is most characteristic of cobras.

Tweedie (1941) stated that the venom of the King Cobra is less toxic than that of the Common Cobra, and any fatality from the bite may be due to the quantity of the venom injected. According to the Orang Asli (Aborigines) in Selangor, bites inflicted by King Cobras are rarely sustained by members of their tribes, but those few that were bitten usually died within 20–30 minutes.

The Common Cobra is found in all types of habitats (Table 1). In human inhabitated areas, cobras are found in basements of houses and under outbuildings. It is sometimes encountered inside bathrooms, sewage pipes and in dwelling rooms. In the

Fig. 2a: **A comparison of a normal palm with that of a palm bitten by the Common Cobra 36 hours after hospitalisation.**

Fig. 2b: **A close-up of the index finger bitten by the Common Cobra.**

open, it can be found in holes in the ground or at the bases of trees among exposed roots.

Like the King Cobra, the Common Cobra is also non-aggressive. It will only attack when provoked or accidentally stepped on. It feeds on small mammals. particularly rats and frogs (Table 3).

There are two forms of common cobras in the country. In the northern part of West Malaysia, a yellowish form is found. Unlike the Indian cobra, the Malaysian species "spit" the venom.

We have encountered many of this species during the course of our work in the field and found that if suddenly disturbed, the snake quickly erects itself, hisses loudly and awaits the opportunity to strike. If one keeps still, the danger is quickly over, and the snake drops its head and moves away.

It has been demonstrated in the laboratory that the snake can spit venom for a distance of about one to one-and-a-half feet. If the venom comes in contact with an open wound, its toxic effect is the same as that of the venom infected in a direct bite. If the spitted venom gets into the eyes, it may cause permanent injury, if not treated immediately.

Often the bite of a cobra is a mere snap of the jaws and the bitten part is immediately released. Rarely will the snake fasten itself tenaciously, necessitating a forcible opening of the jaws to effect release.

Frog hunters at night are commonly inflicted by the bite of this common cobra. On two occasions, two of our frog hunters were bitten on the hand by this snake while searching for frogs at night by the side of forest streams. The symptoms described by these two persons revealed that at the time of the bite there was no pain, but five to ten minutes later, a sharp pain and a prickly sensation developed starting from the site of the bite and gradully spreading through the arm. Swelling, numbness, and discolouration of the palm occurred almost 15 minutes after the bite. Fortunately in both cases, a tourniquet was used as a first aid measure and the persons were rushed to the hospital and received medical attention within one hour after the bite. Both were hospitalised for about a week. Eight months after treatment, scars formed by the bite were still visible.

It is a misconception to think that young cobras are less dangerous than adults. In 1955, two young cobras, about ten to 12 inches long, were brought to this institute. The trapper claimed that they were newly hatched from the eggs. An experiment was carried out to test the toxicity of the venom of these young cobras and compare it with that from a fully-grown adult, 5½ feet long. Two guinea pigs, weighing about 500 grams each, were placed in separate cages containing the young cobras and the adult cobra. It took about six to seven hours before the cobras started attacking the guinea pigs. The guinea pig that was bitten on the hind limb by the young cobra died within 20 minutes and the second one bitten on the body by the adult snake died within 45 minutes. Although the experiments were carried out once only, nevertheless, the potential danger of young and newly-hatched cobras should be noted.

KRAITS

There are three species of kraits inhabiting West Malaysia: the Red-headed Krait **(Bungarus flaviceps)**, the Banded Krait **(B. fasciatus)**, and the Common Krait **(B. candidus)**. The latter two were widely distributed throughout the country, but specimens of

Fig. 3: **Banded Krait, *Bungarus fasciatus*. The snake is in the process of killing its prey, a puff-faced fresh-water snake.**

B. flaviceps have so far been collected from Perak, Pahang and Selangor only. They are strictly nocturnal.

Of the three species of kraits, the Red-headed Krait is the least common. Few specimens have been collected, all of them from primary forests in the lowland (Tables 1 & 2). Tweedie (1941) reported that **Bungarus flaviceps,** is usually found in hilly country, and later in 1957, he mentioned that one specimen was collected from sea-level near the coast of Perak. In subsequent years, four more specimens were collected in the state of Selangor, and one in Pahang, and all these were obtained in the lowland primary forests, which indicates that the snake has a wide range of habitat. Although the distribution of this species extends throughout the Malayan archipelago, it appears to be uncommon in West Malaysia, where not many specimens of this species have been collected thus far.

Stomachs of these specimens contained other harmless snakes (Table 3), but one was found with a partially digested snake of the same species.

There is no information regarding the toxicity of its venom and very little is known of its habits and behaviour in comparison to **B. candidus** and **B. fasciatus.**

The commonest is the **Banded Krait.** This snake is found numerously in mangrove forests and swamps in the coastal region and also around human habitations. Thus, it is common to find them around outbuildings, verandahs, bathrooms and edges of doors in houses. It is less common in inland areas although it is found in lowland primary and secondary forests, scrub fields, ricefields, rubber estates and oil palm estates (Tables 1 & 2). It feeds on reptiles and on one occasion, a fish was found in the stomach of one of the specimens obtained from mangrove forests (Table 3).

The Banded Kraits are among the most inoffensive snakes we know. Captive specimens were timid even when they were teased. In excitement, they flatten the posterior part of the body and inflate and deflate themselves anteriorly like many other snakes. When provoked, they frequently protruded their tongue but seldom struck.

Laboratory experiments carried out on the toxicity of the venom revealed that white rats, which weighed 350 grams, were killed within 50 to 75 minutes compared with that of the cobra, which killed white rats in less than 45 minutes, the venom of the banded krait being less toxic.

The Common Krait is commonly found in inland areas and is frequently encountered around human habitations (Tables 1 & 2). It feeds on reptiles only. Although it killed small mammals in the laboratory, it refused to eat them (Table 3). Otherwise, its behaviour and habits are similar to that of the Banded Krait.

Laboratory tests carried out on similar lines as for the Banded Krait indicated that the venom from the Common Krait is more toxic. It was found that white rats bitten by the Common Krait died within 35 to 50 minutes.

CORAL SNAKES

Four species of coral snakes belonging to two genera, **Callophis** and **Maticora** are found in West Malaysia. All but one, **Callophis maculiceps,** are widely distributed throughout the country. **C. maculiceps** is found in the northern parts of West Malaysia. They are all nocturnal in habits.

The commonest of the coral snakes is the Banded Malaysian Coral Snake **(Maticora intestinalis).** It is found inhabiting all elevations in West Malaysia, and on surrounding islands (Table 2). It is found in primary and secondary forests and around human habitations (Table 1).

In human habitations, this snake is usually found in the garden under flower pots, stones and rubbish heaps. In fields and forests, it is found under dead logs on the forest floor and under wood or in heaps of rubbish. It feeds on reptiles, particularly smaller snakes and tiny lizards (Table 3).

Tweedie (1941) cited the case of Dr. E. Jacobson of Bandung, Java, who was handling a live specimen, accidentally bitten in the web of the fingers, with the implantation of only one fang. According to Tweedie,

Table 1. Distribution of Venomous Snakes in various habitats.

	Primary forest	Secondary forest	Mangrove forest	Scrub	Fields*	Ricefields	Rubber Estate	Oil palm estate	Human habitats*
ELAPIDAE									
Ophiophagus hannah	XX	XX	–	X	X	–	X	XX	–
Naja naja	XXX	XX	XX	XX	XX	XX	XX	XXX	XX
Bungarus candidus	X	X	X	X	X	XX	X	X	XXX
Bungarus fasciatus	X	X	XXX	X	X	X	X	X	XX
Bungarus flaviceps	X	–	–	–	–	–	–	–	
Callophis gracilis	XX	X	–	–	–	–	–	–	
Callophis maculiceps	X	–	–	–	–	–	–	–	
Maticora intestinalis	XXX	XX	X	X	X	X	X	X	XX
Maticora bivirgata	XX	X	–	–	–	–	–	–	–
VIPERIDAE									
Ancistrodon rhodostoma	X	X	–	–	–	XX	XXX	–	–
Trimeresurus wagleri	XXX	XX	X	–	–	–	–	–	–
Trimeresurus sumatranus	XXX	XX	X	–	–	–	–	–	–
Trimeresurus purpureomaculatus	–	X	XXX	–	–	–	–	–	–
Trimeresurus monticola	XX	–	–	–	–	–	–	–	–
Trimeresurus puniceus	XX	–	–	–	–	–	–	–	–
Trimeresurus popeorum	XX	–	–	–	–	–	–	–	–

XXX very common
XX common
X rare
– not observed
* Fields includes lallang fields **(Imperata cylindria)** and back yard gardens.
+ Human habitations are places like towns, villages, and farming villages.

Table 2. Distribution of Venomous Snakes at various elevations and islands.

Species	Lowland	Highland	Islands
ELAPIDAE			
Ophiophagus hannah	XX	X	X
Naja naja	XXX	XX	XXX
Bungarus candidus	XXX	X	X
Bungarus fasciatus	XXX	–	XXX
Bungarus flaviceps	XX	–	–
Callophis gracilis	XX	XX	–
Callophis maculiceps	X	XX	–
Maticora intestinalis	XXX	X	–
Maticora bivirgata	XX	XX	X
VIPERIDAE			
Ancistrodon rhodostoma	XXX	–	–
Trimeresurus wagleri	XXX	–	XX
Trimeresurus sumatranus	XXX	–	XX
Trimeresurus purpureomaculatus	–	–	XXX
Trimeresurus monticola	–	XX	–
Trimeresurus puniceus	XX	–	–
Trimeresurus popeorum	–	XX	–

XXX very common
XX common
X rare
– not observed

Table 3. Food of Venomous Snakes.

Species	Small mammals	Reptiles & amphibians	Birds	Fish
ELAPIDAE				
Ophiophagus hannah	–	+	–	–
Naja naja	+	+	–	–
Bungarus candidus	–	+	–	–
Bungarus fasciatus	–	+	–	+
Bungarus flaviceps	–	+	–	–
Callophis gracilis	–	+	–	–
Callophis maculiceps	–	–	–	–
Maticora intestinalis	–	+	–	–
Maticora bivirgata	–	+	–	–
VIPERIDAE				
Ancistrodon rhodostoma	+	+	+	–
Trimeresurus wagleri	+	–	+	–
Trimeresurus sumatranus	+	–	+	–
Trimeresurus purpureomaculatus	+	+	+	–
Trimeresurus monticola	+	–	–	–
Trimeresurus puniceus	+	+	+	–
Trimeresurus popeorum	+	–	–	–

+ positive
– negative

the symptoms recorded were typical of the venom of the poisonous colubrine snakes; however, the patient recovered after having suffered for more than 1½ days. Dr. Jacobson later said that he was convinced that if both of the snake's fangs had penetrated the skin and discharged their full measure of poison, the effect would have been very serious indeed.

In West Malaysia, there have been no reported cases of man bitten by this snake, but from the above incidence, the toxicity of the venom of this snake is not to be underestimated inspite of the fact that the snake is small.

The Blue Malaysian Coral Snake, **(Maticora bivirgata)**, is the largest of the coral snakes and grows to about five feet in length. It is found inhabiting all elevations and islands (Table 2), and is confined to primary and secondary forests (Table 1) where it is found in crevices of rocks, under fallen trees on the forest floor and also in between roots of large trees. It feeds on reptiles, mainly on other snakes, although in captivity, lizards were also eaten (Table 3).

Harrison (1957) reported a two-year-old girl bitten by a young specimen of this snake while she was playing on a concrete area outside her house near Malacca, West Malaysia. She was bitten between the base of the thumb and the first finger and died before reaching the hospital. From the above incident, it can be said that the bites of these two coral snakes are indeed dangerous.

The uncommon species are the Spotted Coral Snake, **Callophis gracilis** and the Small Spotted Coral Snake, **Callophis maculiceps.** The latter is rare. They are found in primary and secondary forests only (Table 1). **C. gracilis** is found at all elevations and **C. maculiceps** is found in the lowlands only. There are no records of these snakes from islands (Table 2). **C. gracilis** appears to feed exclusively on other small snakes (Table 3), but the feeding habits of **C. maculiceps** are not known, although it also is said to feed on other snakes (Tweedie, 1957).

C. gracilis is found under logs on the forest floor and in crevices between rocks. So far, only a few specimens of these snakes have been collected, and very little is known of their feeding behaviour and habits.

There are no records of man being bitten by these snakes.

PIT VIPERS

West Malaysia has seven species of pit vipers, belonging to two genera, **Ancistrodon** and **Trimeresurus.** The former genus comprises a single species only, while the latter contains six species. All these vipers are active during the day, as well as at night.

Of these vipers, the Malayan Pit Viper, **Ancistrodon rhodostoma,** is the most notable species, being the source of more snake bites than any of the Elapid and Viperid snakes throughout the country (Reid, 1963). The distribution of this snake is confined to Kedah in the northern part of West Malaysia and extending into Southern Thailand. It is a lowland snake (Table 2) and is common in primary and secondary forests, ricefields, and rubber estates (Table 1). It feeds on frogs, lizards and small mammals, and in captivity it also takes birds (Table 3).

This snake is found on the forest floor, taking shelter in between roots of trees, underneath logs and also among heaps of dried leaves. In rubber estates, it is found on the ground or at bases of rubber trees. In ricefields, it is found commonly in the straw during harvest when rats are abundant.

In 1969, when we visited Kedah in connection with filariasis control activities, we also took the opportunity to visit the hospitals at Sungei Patani and Alor Star. In Sungei Patani, we were taken by the State Health Officer, Dr. Mahathevan, to the hospital where we saw five cases bitten by **A. rhodostoma,** and one case inflicted by **T. purpureomaculatus.** Two of the patients were bitten on the palms and the rest on the legs. One case developed gangrene and the others were about to be discharged. On an average, 25 cases of snake bites were admitted into this hospital monthly.

At Alor Star Hospital, the average number admitted was between 30 and 35 cases a month and most of them were bitten by **A. rhodostoma,** although cases bitten by other Viperid and Elapid snakes were also occasionally admitted.

Most of the victims of **A. rhodostoma** were rubber tappers, farmers in padi fields, and people using the forest paths. In the case of **T. purpureomaculatus,** the majority of the vicitms were wood cutters in mangrove swamps.

Of the **Trimeresurus** species, the Speckled Pit Viper, **T. wagleri,** is the commonest. It is abundant in lowland primary and secondary forests, but rare in mangrove or swamp forests (Tables 1 & 2). It feeds on small mammals and birds (Table 3).

This is an arboreal snake. In the forest, it is usually found clinging to branches of trees and bamboos and also found clinging to shrubs on the forest floor as low as two to three feet high. Unlike **A. rhodostoma,** it is seldom found on the forest floor. It is viviparous

Fig. 4: Wagler's Pit Viper, *Trimeresurus wagleri*. The most obvious characteristic of this genus *Trimeresurus*, is the triangularly-shaped head.

Fig. 5: Malayan Pit Viper, *Ancistrodon rhodostoma*. The colour of this snake is well camouflaged with the habitat.

and gives birth to as many as 40 young at a time. This is the species that is kept at the Snake Temple at Penang giving rise to the name "Temple Snake".

The largest and longest of the pit vipers is the Sumatran Pit Viper, **T. sumatranus.** It is strictly a lowland form and is also found inhabiting the surrounding islands (Table 2). It feeds on small mammals and birds (Table 3). Like **T. wagleri,** this is also an arboreal snake and its behaviour in the forests is similar to that of **T. wagleri.** This snake is very aggressive and strikes vigorously if provoked. In Sabah, East Malaysia, this snake is the main source of viperid snake bites in plantations and in forests.

The Shore Pit Viper, **T. purpureomaculatus** is strictly a lowland snake (Table 2) and is confined to coastal regions in mangrove forests, rarely encountered in bamboo forests in inland areas (Table 1). It feeds on small animals, such as small rodents, birds, and lizards (Table 3). It is also an arboreal snake, found clinging to branches of trees ranging from two to ten feet high.

In the northern parts of West Malaysia, especially in Perlis, Kedah, and Perak, this snake is very numerous in the mangrove and swamp forests, where it is known to be one of the chief causes of snake bites (Reid, 1963).

Trimeresurus puniceus, a rare viper in this country, has been recorded five times only. Two of the five specimens were collected by Tweedie (1941 & 1957) from hilly places in Perak and Johore, the rest were obtained by us in lowland forests in the state of Selangor (Lim 1963 & 1967). All three Selangor specimens were obtained from forest canopy ranging from 20 to 70 feet high.

The tail of this snake is very prehensile, much more so than all the rest of the vipers, attesting to its arboreal adaptation. That it was not found previously in the lowlands may be because of lack of knowledge of the habits of this snake. It is quite probable that if the appropriate habitats are searched for this species in forested areas of other states in West Malaysia, considerable light may be thrown on the distribution of this species in other parts of the country. This species appears to be confined to lowland primary forest (Tables 1 & 2). It feeds on small mammals, birds and lizards (Table 3).

The Pope's Pit Viper, **T. popeoprum**, and the Mountain Pit Viper, **T. monticola,** are widely distributed, but strictly confined to hilly areas, in primary forests (Tables 1 & 2). They feed on small mammals (such as rodents), lizards and birds (Table 3).

Both these vipers, **T. popeoprum** and **T. monticola,** are ground dwellers. They are usually found on the forest floor by the sides or underneath logs. They are sluggish snakes. In captivity, these snakes do not thrive well.

SNAKE BITE RATES

Records of snake bites and bites and stings from other animals, for the period from 1958 to 1959, comprising cases admitted in the government hospitals throughout the 11 states of West Malaysia, were reported by Reid (1963). During the years 1960 through 1968, there were 15,919 admissions of cases of snake bite in the 11 states of West Malaysia (Table 4). Of these, 73.6% were from the four northern states of Perlis, Kedah, Penang and Perak; 7.6% were from the west-central parts in Selangor and Negri

Table 4. Admissions into Government Hospitals of Cases of Snake Bites in Relation to the Number of Deaths in West Malaysia (1960 – 1968).

States	1960		1961		1962		1963		1964		1965		1966		1967		1968		Total (1960–1968)		Percentage of Deaths to Admissions
Population	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	
Perlis 111,867	–	–	–	–	150	4	255	3	307	3	330	1	310	1	389	2	405	–	2,146	14	0.65%
Kedah 873,568	395	4	577	6	658	4	652	5	799	5	800	8	884	5	827	7	917	5	6,509	49	0.75%
Penang 714,423	69	–	71	1	94	2	176	1	144	1	144	2	168	2	117	1	141	1	1,124	11	0.98%
Perak 1,547,090	188	1	157	3	171	2	234	1	241	5	261	3	196	–	210	–	288	4	1,946	19	0.98%
Selangor 1,317,046	39	–	56	–	91	1	72	–	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	157	3	142	1	557	5	0.89%
Negri Sembilan 480,394	–	–	62	–	86	–	34	–	46	–	74	–	100	1	134	1	125	1	661	3	0.46%
Malacca 384,371	1	–	3	–	–	–	1	–	6	–	2	–	–	–	–	–	–	–	13	–	0.00%
Johore 1,216,754	89	–	100	4	132	–	112	1	100	1	125	1	81	–	116	1	98	2	953	10	1.05%
Pahang 399,275	38	–	50	–	62	2	79	–	75	2	86	–	90	1	69	–	85	1	634	6	0.95%
Trengganu 356,530	24	–	33	–	73	1	69	–	98	1	133	–	134	–	120	1	126	–	810	3	0.37%
Kelantan 636,812	–	–	–	–	–	–	57	–	100	–	59	1	102	–	95	–	153	1	566	2	0.35%
11 States 8,039,030	843	5	1,109	14	1,517	16	1,741	11	1,916	18	2,014	16	2,065	10	2,234	16	2,480	16	15,919	122	0.76%

A = Admissions
D = Deaths
N.A. = Not available

Table 5. Admissions into Government Hospitals of Cases Resulting from Bites & Stings of Venomous Animals & Insects in Relation to the Number of Deaths in West Malaysia (1960 – 1968).

States	1960		1961		1962		1963		1964		1965		1966		1967		1968		Total (1960–1968)		Percentage of Deaths to Admissions
Population	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	
Perlis																					
111,867	344	4	332	2	161	1	29	–	38	–	27	–	15	–	16	–	20	–	982	7	0.71%
Kedah																					
873,568	205	2	61	1	68	–	72	–	191	–	171	1	184	–	130	–	146	3	1,228	7	0.57%
Penang																					
714,423	77	–	63	–	102	1	87	–	74	1	55	–	149	2	66	1	38	–	711	5	0.70%
Perak																					
1,547,090	130	1	133	–	163	1	141	–	151	1	147	2	225	–	361	2	364	1	1,815	8	0.44%
Selangor																					
1,317,046	105	–	78	2	125	1	129	–	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	99	–	112	–	648	3	0.46%
Negri Sembilan																					
480,394	180	–	120	–	134	–	112	–	172	–	109	–	117	–	166	2	159	–	1,269	2	0.16%
Malacca																					
384,371	2	–	–	–	1	–	2	–	2	–	1	–	N.A.	N.A.	–	–	–	–	8	–	0.00%
Johore																					
1,216,754	94	1	107	–	128	1	167	1	219	–	232	2	240	1	275	–	168	–	1,630	6	0.37%
Pahang																					
399,275	83	–	60	–	72	–	16	1	73	–	81	–	84	2	73	–	76	–	618	3	0.48%
Trengganu																					
356,530	28	–	25	–	31	2	20	–	27	–	36	–	36	–	74	–	80	–	357	2	0.56%
Kelantan																					
636,812	60	2	73	1	53	–	71	–	12	–	34	1	34	–	49	–	46	–	378	4	1.06%
11 States																					
8,039,030	1,314	10	1,052	6	1,038	7	846	2	959	2	893	6	1,084	5	1,309	5	1,209	4	9,704	47	0.48%

A = Admissions
D = Deaths
N.A. = Not available

Sembilan; 6.1% from the two southern states of Malacca and Johore; 12.7% were from the three eastern states of Pahang, Trengganu and Kelantan.

The high prevalence in the four northwestern states were mostly due to bites inflicted by **A. rhodostoma**, particularly in the two northernmost states (Perlis and Kedah) where Reid (1963) reported that **A. rhodostoma** was responsible for 85% of snake bite cases occurring in these two states (from 1958 to 1959). In the other two northern states, Penang and Perak, sea snakes and other venomous snakes were the main source of snake bites, although occasionally cases of **A. rhodostoma** bites were admitted into hospitals in Penang from either Kedah, Prai or Bukit Mertajam (personal comm. Dr. T. Devaraj). Snake bite cases reported in the rest of the seven states in west-central, eastern and southern parts were from bites of other venomous land or sea snakes and harmless snakes.

In 1958–1959, there were 34 deaths (1.1% death rate) among 2,114 snake bite cases admitted into government hospitals throughout the country (Reid, 1963) as compared with 122 (0.7% death rate) among 15,919 cases from 1960–1968. Of the 34 deaths, 20 occurred in Perlis and Kedah out of 1,428 admissions (Reid, 1963). In 1960–1968, 63 of the 122 deaths occurred in these two states among 8,655 admissions. Although the majority of deaths occurred in Perlis and Kedah, the mortality rate was 0.65% in the former and 0.75% in the latter in the period 1960–1968 as compared with 0.73% and 1.67% respectively in 1958–1959 (Reid, 1963). Penang and Perak had 19.3% of the snake bites, with death rates of 0.98% in each state. The rest of the seven states had 26.4% of the total snake bite cases, with death rates ranging from zero to 1.05%.

were recorded from 1960 to 1968 (Table 5). Most of these bites and stings were inflicted by arthropods, such as wasps, bees, hornets, spiders, scorpions and centipedes, and the rest were by marine animals, such as jelly fish, poisonous shells, sea urchins and fish.

The northern states had the highest prevalence of cases, comprising 48.7% of the total admissions for the country as compared to 19.6% for the west-central states, 16.9% for the southern states and 14.8% for the eastern states. With the exception of Malacca and Kelantan, the average mortality rate was about 0.5%. In Malacca, there were no reported fatalities among only eight admissions during the 8-year period (excluding 1966, when no information was available). In Kelantan, the mortality rate appeared to be the highest, 1.06% of 378 admissions.

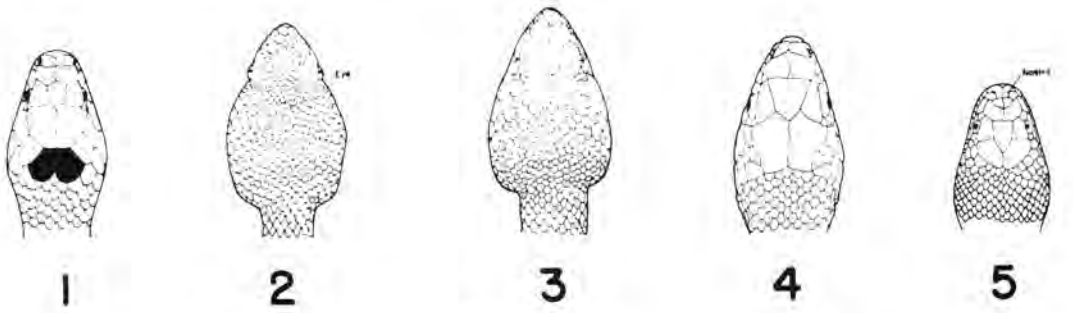
DISCUSSION

The elapid snakes, all but the Common Cobra, were found to feed on reptiles and amphibians. The Common Cobra feeds mainly on small rodents, such as field rats, and, to a lesser extent, on amphibians, e.g. frogs. The viperid snakes appear to be very adaptable in their food habits as they take not only warm-blooded vertebrates but also the cold-blooded vertebrates.

Cannibalism among the elapid snakes appears to be very common. This has been found in Kraits, Coral Snakes and King Cobras in previous investigations (Lim, 1956 & 1960). It is, therefore, reasonable to assume that their cannibalistic behaviour may help maintain a natural population balance of the elapid snakes. This may have a bearing on the ideas of Wynne-Edwards (1962) in regard to self-regulation of animal numbers.

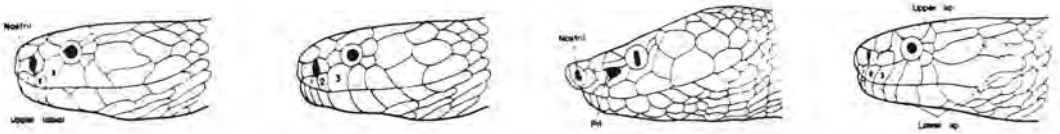
1. Tail flattened like the blade of an oar (Fig. 13) ..... Sea Snakes
   Tail not so ..... Land and fresh and tidal water Snakes 2
2. Head (Fig. 1) with the side of head (Fig. 6) with belly (Fig. 10) and with tail (Fig. 15) ..... *Ophiophagus hannah* (KING COBRA)
   Head (Fig. 2) with side of head (Fig. 8) with belly (Fig. 10) and with tail (Fig. 17) ..... *Trimeresurus* spp. (PIT VIPERS)
   Head (Fig. 3) with side of head (Fig. 8) with belly (Fig. 10) and with tail (Fig. 17) ..... *Ancistrodon rhodostoma* (MARBLED PIT VIPER)
   Head (Figs. 4 & 5) 3
3. Side of head (Fig. 6) with head (Fig. 4) with belly (Fig. 10) and with tail (Fig. 18) ..... *Naja naja* (COMMON COBRA)
   Side of head (Fig. 7) with head (Fig. 4) with belly (Fig. 10) and with tail (Figs. 14 & 15) ..... *Bungarus* spp. (KRAITS)
   Side of head (Fig. 7) with head (Fig. 4) with belly (Fig. 10) and with tail (Figs. 17 & 18) ..... *Maticora* spp. and *Callophis* spp. (CORAL SNAKES)
   Side of head (Fig. 9) and with head (Fig. 5) 4
4. Tail (Fig. 13) and with belly (Fig. 12) ..... Sea Snakes
   Tail (Figs. 16–18) and with belly (Figs. 11 & 12) ..... Fresh and tidal water snakes (HARMLESS)

DIFFERENCES BETWEEN VENOMOUS AND HARMLESS SNAKES OF MALAYSIA



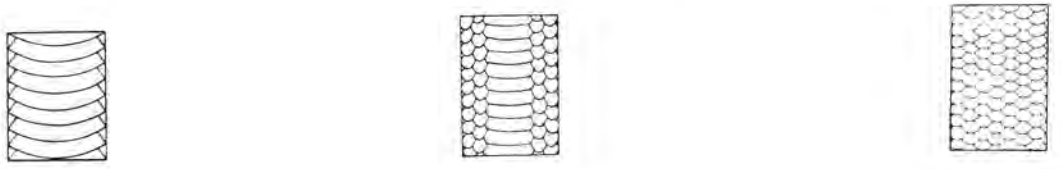
1 2 3 4 5

HEAD (TOP)



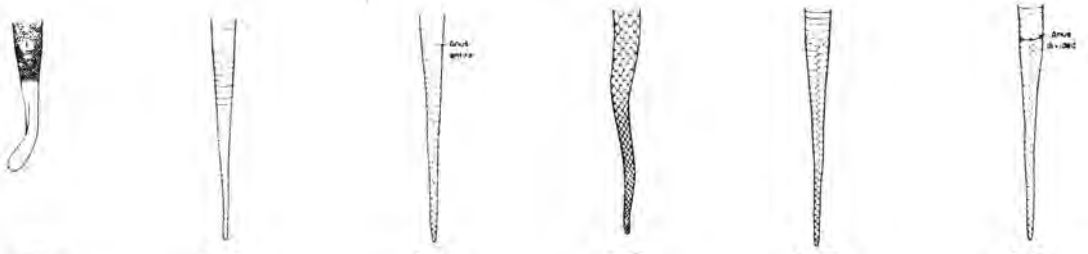
6 7 8 9

HEAD (SIDE)



10 11 12

BELLY



13 14 15 16 17 18

TAIL

According to Inche Hassan bin Haji Mohd. Nor (1965), the estimated population in the 11 states of West Malaysia was 8,039,030. The least populated state is Perlis, with a population of 111,867 and the highest is Perak, 1,547,090. Snake bite cases involved less than 0.2% of the total human population throughout West Malaysia. Even in the two northernmost states, Perlis and Kedah, where prevalence of snake bites was highest, the death rate was very small (Table 4).

BITES AND STINGS OF VENOMOUS ANIMALS OTHER THAN SNAKES

An overall mortality rate of 0.48% of a total of 9,704 admissions resulting from bites and stings of insects and venomous vertebrates other than snakes

Harrison (1956) stated that snakes may serve to keep numbers of wild rats down in nature. Lim (1961) reported that 63 or 98 species of land snakes, including the venomous species, fed mainly on rats, but that amphibians and reptiles were also taken by some of these snakes. The common cobra and all of the viperid snakes, although potentially dangerous to humans, therefore play some essential economic roles as predators on pests, such as rats.

Although snake bites are a serious medical problem in Malaysia, particularly in the northwestern part of West Malaysia, deaths from snake bites are surprisingly few. The present report supports the findings of Reid (1963) that the two northernmost states, Perlis and Kedah, have the highest incidence of snake bites and have more deaths than any other states. The mortality rate, however, is less than 1%.

In other states, the death rate is even lower. **A. rhodostoma** has been the main cause of snake bites in the northwestern states, whereas venomous snakes, such as cobras, kraits, coral snakes, vipers, sea-snakes and including harmless snakes, were involved in snake bite cases in the west-central, southern and eastern states of West Malaysia.

It is evident from the present report and from investigations carried out by other workers that the prevalence of snake bite cases in West Malaysia is influenced by the local distribution and abundance of the various species of venomous snakes, especially those that are commonly found near human habitations, particularly in the northwestern states of West Malaysia. With the exception of **A. rhodostoma** and **C. maculiceps** that are confined to the northern parts of West Malaysia extending south as far as Perak, the rest of the venomous snakes are widely distributed throughout the country.

During 1958–1959, admissions to general hospitals throughout the country due to bites and stings of venomous animals other than snakes were 2,070 cases, with 20 deaths (Reid, 1963). For the period 1960–1968, a total of 9,704 admissions, with 47 deaths (0.48% death rate), were recorded (Table 5).

Archer (1958) stated that hornets were commonly encountered in the Malaysian forests and these insects were very aggressive, especially in the vicinity of their nests. Deaths from bee or wasp stings were caused by multiple stings and by the amount of the venom injected. Reports of deaths of humans, water buffaloes, and even elephants due to the giant Asian bee, **Apis dorsata**, were also cited and Tweedie (1941) reported that bites and stings by scorpions, bees, wasps, spiders, centipedes, jelly fish, sea urchins and cones (shells) were common. Lately, a case of spider bite was reported by Lim and Davis (1970), but the patient recovered 12 hours after hospitalisation.

It is evident from these records that apart from snake envenomations, bites and stings by other venomous animals poses a potential danger to man, although the death rate reported for the periods 1960–1968 was less than 0.5%.

SUMMARY

During the period 1960–1968, 15,919 cases of snake bites and 9,704 cases of bites and stings by other venomous animals were admitted to hospitals throughout West Malaysia. Death rates resulting from the former averaged 0.76% and the latter 0.48%. The distribution of the venomous land snakes, their habits, and feeding behaviour are discussed.

ACKNOWLEDGEMENTS

This study was made possible through the co-operation of the staff of the Medical Ecology, Institute for Medical Research, Kuala Lumpur. We are grateful to Dr. M. Mahathevan, State Health Officer in Sungei Patani, Kedah; Dr. T. Devaraj, Director, Snake and Venom Research Institute, Penang; for their help in providing information on patients bitten by venomous animals in their respective areas, and also to the Ministry of Health, Kuala Lumpur, particularly to Mr. E.J. Martinez, for sending us the data on stings and bites by venomous animals for 1960–1968; to Mr. Lee Eng Kee for his assistance in the illustration of the snake chart.

REFERENCES

Archer, T.C.R. (1958) Medical problems of the operational infantry soldier in Malaya. *J. of Royal Army Medical Corps.* 104: 1–13.

Harrison, J.L. (1956) Snakes as rat-eaters. *Mal. Nat. J.* 10:

(1957) The bite of a Blue Malaysian Coral Snake or Ular Matahari. *Mal. Nat. J.* 11: 130–132.

Hassan bin Haji Mohd. Nor (1965) Population, Births, Deaths, Marriages and Adoptions. Government Printers, Kuala Lumpur, 91 pp.

Lim, B.L. (1955) Snakes collected near Kuala Lumpur. *Mal. Nat. J.* 10: 139–144.

(1956) The natural food of some Malayan Snakes. *Mal. Nat. J.* 10: 139–144.

(1960) Observations on some captive snakes. *Mal. Nat. J.* 14: 181–187.

(1961) The role of snakes in the balance of nature. 21st Anniversary Special Issue. *Mal. Nat. J.* 211–213.

(1963) Comments on some rare snakes. *Fedn. Mus. J.* 11: 60–64.

(1968) Further comments on rare snakes. *Fedn. Mus. J.* 12: 123–126.

Lim, B.L. and Davis, C.E. (in press) The bite of a bird-eating Spider, **Lampropelma violaceopedes**. *Mal. Med. J.*

Reid, H.A., Thean, P.C. and Martin, W.T. (1963) Epidemiology of snake bite in North Malaya. *Brit. Med. J.* 992–7.

Swaroop, S. and Grab, B. (1954) Snake bite mortality in the World. *Bull. World Health Org.* 10: 35–76.

Tweedie, N.W.F. (1941) Poisonous animals of Malaya. Malaya Publishing House Ltd. Singapore 90 pp.

(1957) The snakes of Malaya. 2nd ed. Singapore Government Printing Office.

Tweedie, N.W.F. and Reid, H.A. (1956) Poisonous snakes in Malayan Museum Popular Phamphlet No. 11. 16 pages.

Wynne-Edwards, V.C. (1962) Animal dispersion in relation to social behaviour. Oliver and Boyd Ltd., Edinburgh. 653 pp.

Present status of resistance and susceptibility of four species of West Malaysian Culicine mosquito larvae to insecticides

by Vijayamma Thomas

Department of Parasitology,
Faculty of Medicine,
University of Malaya,
Kuala Lumpur.

INTRODUCTION

IN ADDITION TO being the most common nuisance mosquitoes throughout West Malaysia, **Culex pipiens fatigans, Aedes aegypti, Aedes albopictus** and **Armigeres subalbatus** are natural or experimental vectors of various filarial and viral infections of man and animals.

C.p. fatigans is the most common urban mosquito and the most important natural vector of the "urban" strain of **Wuchereria bancrofti** in India, Ceylon, Burma and other Southeast Asian countries, including Malaysia.

Aedes aegypti, commonly called the yellow fever mosquito, is widely distributed throughout the tropics and subtropics. It is also the primary vector of endemic dengue and of dengue haemorrhagic fever in India, Thailand, Burma, Malaysia, Singapore and other countries of Southeast Asia (Rudnick, 1967). **Aedes aegypti** is predominantly an urban mosquito and is very closely associated with man.

As a result of the medical importance of these two species and their high prevalence rate in various regions of the world, very extensive work has been done on the susceptibility of the larvae and adults of these species. Many strains of both species have developed resistance to various types of insecticides. The number of strains which have developed resistance and the insecticides to which they have developed resistance are discussed by Brown (1967a). He has also reviewed the mode of inheritance of resistance in these species to various compounds (Brown, 1967b). However, published data on the susceptibility or resistance of the Malaysian strains of these mosquitoes to various insecticides are scanty and not up to date. Therefore, the study of these species was made to estimate the susceptibility or the development of resistance of the larvae of these species to the more common insecticides.

Aedes albopictus is also a very common mosquito which coexists with **Aedes aegypti** in urban areas and it breeds in the immediate vicinity of houses. These are present in urban areas as well as in less populated rural areas of Malaysia. In some rural areas near rubber plantations, this species predominates over all other mosquitoes. It has been shown to be a natural vector of dengue (Rudnick, 1966a, 1966b) in Malaysia and Singapore. In spite of its importance as a vector of dengue fever and as a pest, very little work has been done on the susceptibility levels of this species to insecticides.

Armigeres subalbatus is essentially an oriental mosquito with a wide distribution throughout West Malaysia and in neighbouring countries from India to

Japan. In West Malaysia, this species occurs in the urban and the rural areas as well as in forest areas and bites man and animals freely. It has been found to be very efficient experimental vector of **Brugia pahangi** which is predominantly an animal filaria resembling **B. malayi**. Although **B. pahangi** has not been found infecting man in nature, it has been experimentally transmitted to human volunteers (Edeson, et al, 1960). In spite of these facts, there is no information on the susceptibility of adults or larvae of this species to any insecticide.

MATERIALS AND METHODS

Insecticides

Eight insecticides – DDT, methoxychlor, dieldrin, BHC, malathion, fenthion, fenitrothion and diazinon – were tested against the larvae. All except methoxychlor were obtained as standard solutions from the Vector Biology and Control Unit of the World Health Organisation, Geneva. When any intermediate strengths of insecticides were needed, these were prepared from higher does by diluting them with the desired quantity of ethenol. Methoxychlor was obtained from Dr. C.N. Smith, Director, Insect Attractants, Behaviour and Basic Biology Research Laboratory, Florida, as a 95.1% technical grade product. Desired weight of the insecticide was dissolved in ethenol to make a ten p.p.m. stock solution. The weaker dilutions were prepared from the stock solution.

Mosquito larvae

Larvae of **Culex pipiens fatigans** were obtained from eggs which were collected from breeding sites in Kuala Lumpur. These eggs were brought to the laboratory and were reared under standardised laboratory conditions and tests were done on fourth-instar larvae.

Large numbers of larvae of **Aedes aegypti** and **Ae. albopictus** were collected from a common breeding site in Kuala Lumpur. The larvae were brought to the laboratory and reared under standard conditions. When these pupated, the pupae were kept individually in tubes. As adults emerged, these were identified and separated into two species and with these adults, two parent colonies were established. Larvae from these colonies were used for susceptibility tests.

It has been difficult to collect from nature large numbers of larvae of the same age, size and physiological conditions as are required for the tests. In addition, most of the collections contained larvae of **Aedes aegypti** and **Aedes albopictus** in varying proportions. As such it was laborious, time-consuming and impractical to separate larvae-collected from the field into two species for tests. **Armigeres subalbatus** larvae were obtained from a laboratory colony which was collected from Kuala Lumpur and kept in the insectory of this department for more than a year.

The tests were conducted at room temperatures between 24° C and 28° C. In all tests, only fourth-instar larvae were used. The larval susceptibility levels were determined by the standard method (WHO Expert Committee on Insecticides, 1963). The LC_{50} and LC_{90} levels were obtained from log dosage /probit regression lines as fitted by eye.

RESULTS AND DISCUSSIONS

The results are summarised in the following table. Figures 1 to 8 show the log dosage/probit regression lines for the four species of mosquitoes to various insecticides.

Culex pipiens fatigans

The tolerance of the larvae of this species has been found to be highest to DDT with an LC_{50} value of 0.52 p.p.m. This was slightly higher than the previous record (Thomas, 1962). The larvae have developed 13-fold resistance to BHC during the past few years and the LC_{50} level was 0.35 p.p.m. compared with the previous published value of 0.026 p.p.m. (Reid, 1955). Among the hydrocarbons tested, the larvae were most susceptible to methoxychlor with LC_{50} level of 0.092 p.p.m. The LC_{50} level to dieldrin was 0.24 p.p.m. The larvae were comparatively more susceptible to organophosphorous compounds than to hydrocarbons. Of the four O.P. compounds tested against this species, fenitrothion was the most toxic compound with LC_{50} of 0.023 p.p.m. followed by diazinon (LC_{50} 0.04 p.p.m.) and malathion (0.08 p.p.m.). The larvae have already developed resistance to fenthion (Thomas, 1970). The log dosage/probit regression lines are given in Figures 1 and 2. The regression line for DDT was flat, but others were comparatively steep.

Aedes aegypti

Of the six insecticides tested, the larvae were most susceptible to DDT (LC_{50} 0.072 p.p.m.) and then to methoxychlor and fenthion, both with LC_{50} values 0.11 p.p.m. The LC_{50} level for dieldrin was 0.16 p.p.m. The log dosage/probit regression lines for DDT and dieldrin were flat. The larvae of this species were resistant to BHC and malathion and showed LC_{50} value of 0.66 p.p.m. and 0.64 p.p.m. respectively. The log dosage/probit regression lines are shown in

Mortality Rates, LC50 and LC90 Values for larvae of **C.p. fatigans, Ae. aegypti, Ae. albopictus** and **Ar. subalbatus** to various insecticides.

Species of Mosquito	Insecticides Tested	No. of Replicates (25 larvae per replicate)	Corrected Percentage larval mortality after 24 hours' exposure to various concentrations of insecticides (p.p.m.)																LC 50 (p.p.m.)	LC 90 (p.p.m.)
			0.004	0.005	0.01	0.02	0.03	0.04	0.05	0.075	0.08	0.1	0.15	0.2	0.25	0.3	0.5	1.0	2.5	
Culex pipiens fatigans	DDT	14							7.0			12.6			30.0		54.9	71.0	83.7	0.52	2.5
	Methoxychlor	10							14.2		43.6	60.0			92.8					0.092	0.22
	Dieldrin	10										2.4			51.2		95.9			0.24	0.42
	BHC	13										6.1		23.0		35.5	67.6	92.0		0.35	0.97
	Malathion*	11				1.0		12.0	16.0	45.2		67.0		96.0						0.08	0.162
	Fenitrothion	10			3.3	40.0	79.8	96.6												0.023	0.041
	Fenthion*	18							2.0			46.0	91.0	98.2			100			0.10	0.15
	Diazinon*	14				9.2	21.7	45.1	75.1		100									0.04	0.072
Aedes aegypti	DDT	10				24.0			46.0			57.8					86.0	90.0		0.072	0.82
	Methoxychlor	12							14.0		33.0	45.4		80.5			98.3			0.11	0.27
	Dieldrin	9				18.4			30.5			47.1			53.4			78.0		0.16	
	BHC	8												4.1		8.4	42.0	70.5	100	0.66	1.61
	Malathion	12										2.4		10.3			36.8	73.2	100	0.64	2.10
	Fenthion	13							3.2		22.0	39.0	78.0	100						0.11	0.19
Aedes albopictus	DDT	2							9.0			27.0			65.0		83.3	100		0.18	0.63
	Methoxychlor	2							6.6			28.0		79.0	88.0		100			0.13	0.28
	Dieldrin	12	5.1		22.6	44.3			57.1			63.8			83.0		100			0.04	0.43
	BHC	11										20.9		62.2		79.6	88.8	100		0.17	0.45
	Malathion	10							10.2			59.2	74.1	91.5						0.095	0.19
	Fenthion	18										27.3	60.6	85.3	100					0.13	0.23
Armigeres subalbatus	DDT	11				4.9	60.6	89.3	97.4											0.029	0.041
	Methoxychlor	11									8.2	21.3		88.2	95.8		100			0.116	0.21
	Dieldrin	12					16.0	54.4	80.1		100									0.039	0.056
	BHC	15									10.5	16.0		52.0		71.1	100			0.20	0.50
	Malathion	2										17.9	49.4	68.7			100			0.16	0.30
	Fenitrothion	10		6.1		25.0						62.2					100			0.06	0.47
	Fenthion	18										2.1	25.0	51.1		94.0	100			0.19	0.28

* Thomas, V., (1970) Southeast Asian J. Trop. Med. Pub. Hlth.

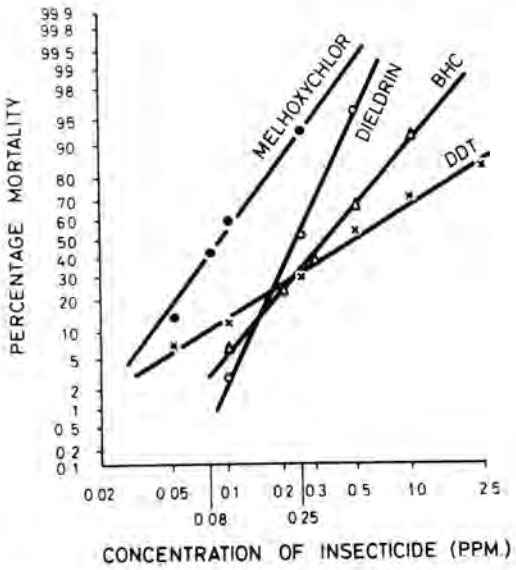


Fig. 1: **Dosage-mortality regression lines to DDT, methoxychlor, dieldrin and BHC for 4th instar larvae of *C.P. Fatigans* from Kuala Lumpur.**

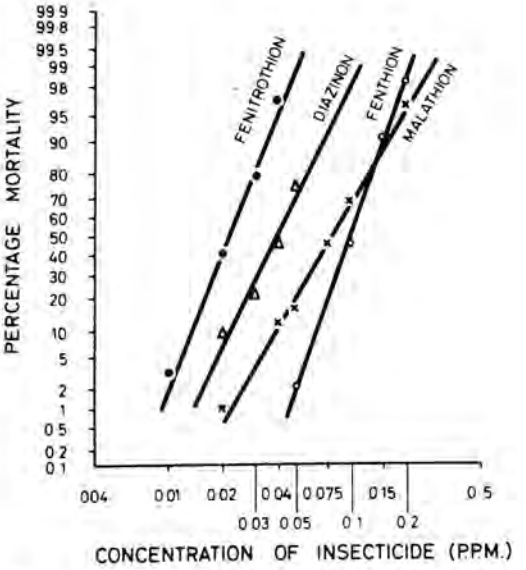


Fig. 2: **Dosage-mortality regression lines to malathion, fenitrothion, fenthion and diazinon for 4th instar larvae of *C.P. Fatigans* from Kuala Lumpur.**

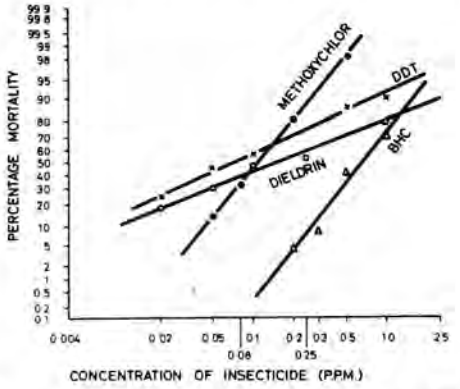


Fig. 3: **Dosage-mortality regression lines to DDT, methoxychlor, dieldrin and BHC to 4th instar larvae of *Ae. Aegypti* from Kuala Lumpur.**

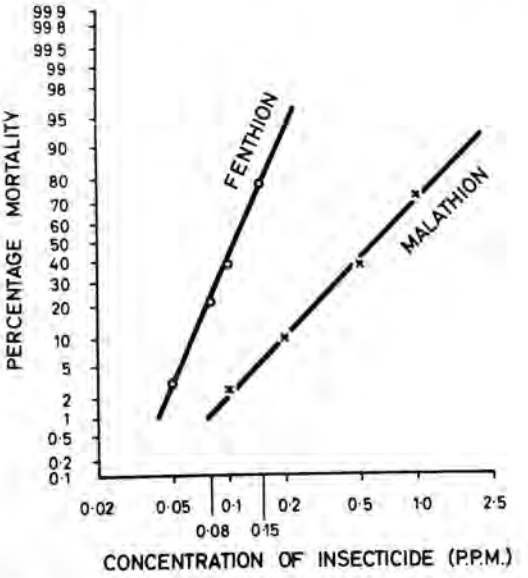


Fig. 4: **Dosage-mortality regression lines to malathion and fenthion to 4th instar larvae of *Ae. Aegypti* from Kuala Lumpur.**

Figs. 3 and 4. The susceptibility level to fenthion was 0.11 p.p.m. A comparison with the previous published data (Wharton, 1955) showed that the larvae have developed a 9-fold increase in tolerance to DDT, 11-fold increase in LC^{50} level to dieldrin and 10-fold increase in LC^{50} to BHC. Since there were no published data on the susceptibility levels of W. Malaysian **Ae. aegypti** larvae to fenthion, malathion or fenitrothion, it is not possible to say how much tolerance the larvae have developed during the past decade or so.

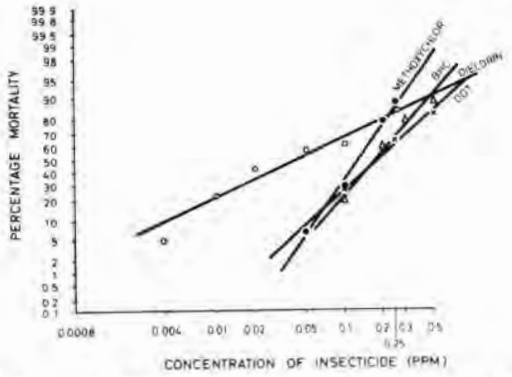


Fig. 5: **Dosage-mortality regression lines to DDT, methoxychlor, dieldrin and BHC to 4th instar larvae of *Ae. Albopictus* from Kuala Lumpur.**

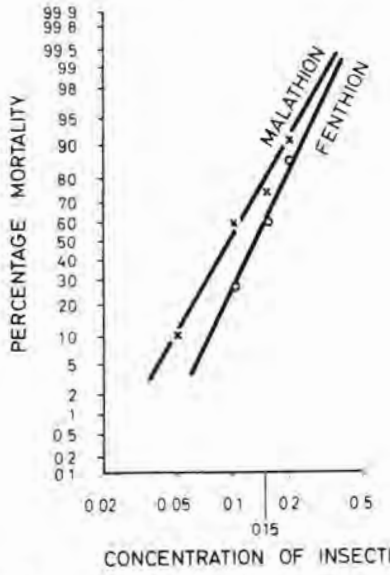


Fig. 6. **Dosage-mortality regression lines to malathion and fenthion to 4th instar larvae of *Ae. Albopictus* from Kuala Lumpur.**

Aedes albopictus

Four hydrocarbons were tested against larvae and these were tolerant to DDT, BHC and Methoxychlor with LC_{50} values of 0.18 p.p.m. 0.17 p.p.m. and 0.13 p.p.m. respectively. The larvae were, however, susceptible to dieldrin (LC_{50} 0.04 p.p.m.). The tolerance levels of DDT, BHC, and dieldrin have increased by 2.7, 1.7 and 2.1 times respectively in comparison with previous results (Wharton, 1955). The LC_{50} levels for malathion and fenthion were 0.095 p.p.m. and 0.13 p.p.m. respectively and the larvae were tolerant to these compounds. The log dosage/probit regression lines are shown in Figs. 5 and 6.

Armigeres subalbatus

Four hydrocarbon insecticides were tested against the larvae of **Ar. subalbatus.** The larvae were most susceptible to DDT (LC_{50} 0.029 p.p.m.) and then to dieldrin (0.039 p.p.m.) but they were tolerant to methoxychlor (0.116 p.p.m.) and to BHC (0.20 p.p.m.). Among the three organophosphorous compounds tested, fenitrothion was the most toxic insecticide, with LC_{50} value of 0.06 p.p.m. followed by malathion (0.16 p.p.m.) and fenthion (0.19 p.p.m.). The larvae were tolerant to all compounds except to DDT and dieldrin and it was rather surprising that these compounds were still potent to the larvae although these have been the most widely used insecticides in West Malaysia. The log dosage/probit regression lines are shown in Figs. 7 and 8. Since there are no published data on the susceptibility of the larvae of this species to any insecticide, either from Malaysia or other parts of the world, it is difficult to say whether the larvae are tolerant in nature before the wide-scale use of the insecticides. The high tolerance levels in larvae, most probably, have developed during the past few years.

Comparative Toxicity of various compounds to these mosquitoes.

It has been found difficult to establish that any one insecticide was most toxic to all four species of mosquitoes. Individual compounds gave varying results to different species of mosquitoes. However, BHC has been found to be the least toxic compound to larvae of all four species tested (Table 1). **Aedes aegypti** has developed a 10-fold resistance to it. DDT was the most toxic compound against **Ar. subalbatus** and **Ae. aegypti** although less potent to other two species. Methoxychlor was toxic to **C.p. fatigans** although less toxic to the other three species.

Of the four organophosphorous compounds, fenitrothion was tested only against **C.p. fatigans** and **Ar. subalbatus.** It was found to be the most toxic compound against **C.p. fatigans** and the second most toxic compound against **Ar. subalbatus.** Diazinon was tested only against **C.p. fatigans** and it is not possible to compare its potency with other species. Malathion was toxic to **C.p. fatigans** and **Ae. albopictus,** but was not very potent to **Ar. subalbatus** larvae. **Aedes aegypti** has developed resistance to it. The toxicity of

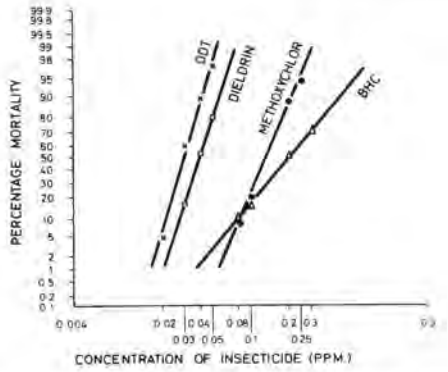


Fig. 7. **Dosage-mortality regression lines to DDT, methoxychlor, dieldrin and BHC to 4th instar larvae of *Ar. subalbatus*.**

fenthion was more or less uniform to all species tested.

SUMMARY

The larvae of four species of mosquitoes were tested against six to eight different insecticides.

The larvae of **Culex pipiens fatigans** from Kuala Lumpur have developed a 13-fold resistance to BHC. A four-fold increase in tolerance has already been noticed to malathion and diazinon. The **Aedes aegypti** larvae have developed a 9-fold increase in tolerance to DDT, an 11-fold increase in tolerance to dieldrin and a 10-fold increase in resistance to BHC over the past 15 years. The larvae were resistant to malathion.

In spite of the increased tolerance, DDT was found to be the most potent insecticide to **Ae. aegypti** larvae tested. **Aedes albopictus** larvae were tolerant to all compounds except to dieldrin. There was a 1.7 – 2.7 fold increase in tolerance to the three hydrocarbons, DDT, dieldrin and BHC, during the past 15 years. The larvae of **Ar. subalbatus** were tolerant to all insecticides tested except to DDT and dieldrin. The potency of each insecticide to larvae of various species of mosquitoes has been evaluated.

This is the first time that the susceptibility levels of the larvae of **Ar. subalbatus** to insecticides have been published. Similarly, there are no other published data on the susceptibility levels of **Ae. albopictus** to methoxychlor, malathion and fenthion. The susceptibility levels of Kuala Lumpur strains of **C.p. fatigans** against methoxychlor and fenitrothium and those of **Ae. aegypti** against methoxychlor, malathion and fenthion are also published for the first time.

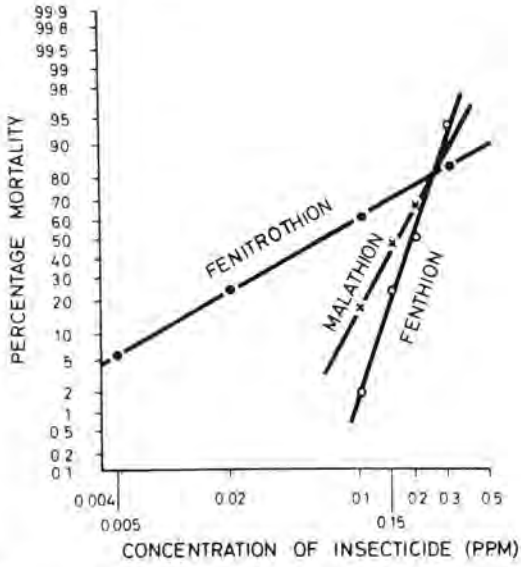


Fig. 8. **Dosage-mortality regression lines to malathion, fenitrothion and fenthion to 4th instar larvae of *Ar. Subalbatus*.**

ACKNOWLEDGEMENTS

The author wishes to express thanks to Professor B. Bisseru, Department of Parasitology, Faculty of Medicine, University of Malaya, for encouragement and placing all the facilities of the department at her disposal. She also wishes to express thanks to Dr. S. Ramalingam for reading the manuscript and for making suggestions. Thanks are also due to the Vector Biology and Control Unit, W.H.O., Geneva, and to Dr. C.N. Smith, Director, Insect Attractants, Behaviour and Basic Biology Research Laboratory, for supplying the insecticides. The author also wishes to express special thanks to Mr. Yap Pak Leng, Mr. T. Varughese, Mr. A. Perianan, Mr. Loh Hock Chai and Mr. Mohd Hashim for technical aid. The author wishes to thank the Department of Medical Illustration, Faculty of Medicine for making the drawings.

REFERENCES

Brown, A.W.A. (1967a) Presidential address delivered at the opening session of the annual meeting of the Entomological Society of America in New York City, November 27, 1967.

Brown, A.W.A. (1967b) Genetics of Insecticide Resistance in Insect Vectors. *Genetics of Insect Vectors of disease.* Elsevier Publishing Company Amsterdam pp. 505 – 552.

Edeson, J.G.B. Wilson, T., Wharton, R.H. and Liang, A.B.G. (1960) Experimental transmission of **Brugia malayi** and **B. pahangi** to man. *Trans. Roy. Soc. Trop. Med. Hyg., 54:* 229.

Reid, J.A. (1955) Resistance to insecticides in the larvae of **Culex fatigans** in Malaya. *Bull. Wld Hlth Org., 12:* 705.

Rudnick, A. (1966a) Dengue Viruses Isolated from Mosquitoes in Singapore, 1960–61. *Bull. Wld Hlth Org., 35*: 63.

Rudnick, A. (1966b) Mosquito studies in Relation to Haemorrhagic Fever in the Philippines and South-East Asia. *Bull. Wld Hlth Org., 35*: 77.

Rudnick, A. (1967) **Aedes aegypti** and Haemorrhagic fever. *Bull. Wld Hlth Org., 36*: 528.

Thomas, V. (1962) The susceptibility of **Culex pipiens fatigans** Wiedemann larvae to Insecticides in Malaya. *Bull. Wld Hlth Org., 27:* 595.

Thomas, V. (1970) Fenthion-Resistance in **Culex pipiens fatigans** Wiedermann in Kuala Lumpur, West Malaysia. *Southeast Asian J. Trop. Med. Pub. Hlth., 1*: 93.

Wharton, R.H. (1955) The susceptibility of various species of mosquitoes to DDT, dieldrin and BHC. *Bull. Ent. Res., 46*: 301.

Wharton, R.H. (1958) Dieldrin Resistance in **Culex pipiens fatigans** *in Malaya. Bull. Wld Hlth Org., 18*: 657.

WHO Expert Committee on Insecticides (1963) Instructions for determining the susceptibility or resistance of mosquito larvae to Insecticides. *W.H.O. Tech. Rep. Ser., 265:* 41.

Buerger's disease affecting the axillary artery

by K. Thavaraja Singham
MBBS
Department of Medicine,
University of Malaya,
Kuala Lumpur.

IN BUERGER'S DISEASE, the pathological process usually involves intermediate and small arteries of the lower limbs. Involvement of the larger vessels is an uncommon finding in this disease. This case report is of a patient who presented with symptoms of occlusive vascular disease and was found to have Buerger's disease involving the axillary artery in addition to other peripheral vessels.

Case Report

A 27-year-old male Chinese carpenter was admitted on 15th July, 1969, with a history of progressive weakness and pain on exercise in his right upper limb of a year's duration. Four months after the onset of symptoms, he found that he had to stop working as a carpenter. Two months later, he experienced pulling, a cramp-like pain in his left calf muscle on exertion but this disappeared with rest. The distance he was able to walk before the onset of pain became progressively shorter. He also noted coldness of the right limb. There was no history of migratory thrombophlebitis. He had been smoking about ten cigarettes a day for the last 17 years.

On examination, he was found to be a well-covered individual. Mild wasting of his right biceps, triceps, thenar and hypothenar muscles was noted. The right upper limb was also colder than the left. The other abnormal findings were in the examination of the peripheral pulses. All other systems were normal.

In the right upper limb, none of the arterial pulse were palpable. In the left upper limb, pulsations were absent over the radial and ulnar arteries, but weak pulsations could be felt over the axillary and brachial arteries. In the lower limbs, all pulses on the right side were easily palpable, while those on the left were markedly diminished. Carotid and temporal pulses were palpable and equal on both sides. No murmurs were heard in the neck, axillae or abdomen. Blood pressure could not be recorded in both upper limbs and left lower limb. It was 130/80 mmHg in the right lower limb. The optic fundi and heart were normal.

Laboratory investigations revealed a haemoglobin of 13.3 gm. per 100 ml., leucocyte count was 8,100/ml. with a normal differential count, erythrocyte sedimentation rate was 40 mm/hr. and a subsequent reading was 15 mm./hr. Urinalysis was normal. Serum cholesterol, blood sugar, blood urea and serum proteins were within normal limits. No Lupus-Erythematosis cells were found in the peripheral blood and the blood Kahn test was negative. Electrocardiographic studies and radiological examination of the chest revealed no abnormality.

An arch aortogram done via the right femoral artery showed obstruction of the right mid-axillary (Fig. 1) and left brachial arteries; and a femoral arteriogram showed occlusion of the left popliteal artery.

In view of his disability, it was felt that vascular reconstructive surgery should be attempted in the right upper limb. At operation, the right axillary

Fig. 1: Occlusion of the right mid-axillary artery and a branch of left axillary artery.

artery was found to be thrombosed in the second and third parts and the right brachial artery was also thrombosed and narrowed, the thrombosis extending to the junction of the middle and lower third of the arm. A right brachial arteriogram done at operation showed the distal part of the brachial and radial arteries to be patent but the ulnar artery was narrowed and obstructed in the distal third of the forearm. A right axillary to brachial artery dacron-vein bypass graft was inserted. A biopsy of right axillary artery and right saphenous vein was taken.

The section of the axillary artery revealed occlusion of the lumen by an organising thrombus in which scattered lymphocytes and haemosiderin laden macrophages were present; there were no giant cells. The internal elastic membrance was intact (Fig. 2) apart from a few small foci of fragmentation. The intima was not thickened and there were no collections of neutral fat or cholesterol clefts. There was perivascular fibrosis.

Sections from the right saphenous vein (Fig. 3) showed occlusion of the lumen by fibromuscular tissue in which prominent blood vessels were present. In addition, there was perivenous fibrosis.

Discussion

Classically, Buerger's disease affects young male adults with a long history of smoking as in this patient. However, an unusual feature of the disease in this patient is the occlusion of the axillary artery.

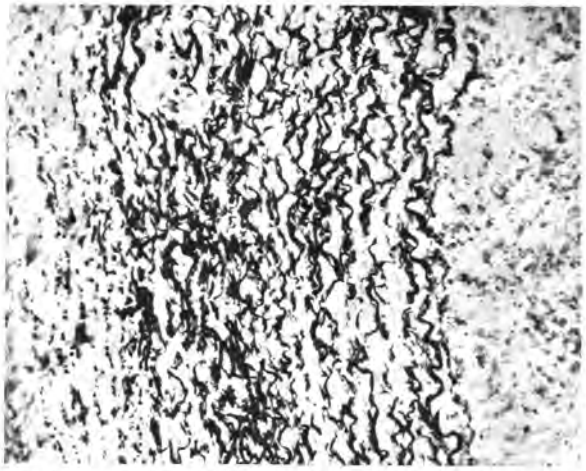


Fig. 2: Photomicrograph of axillary artery showing the intact internal elastic membrance.

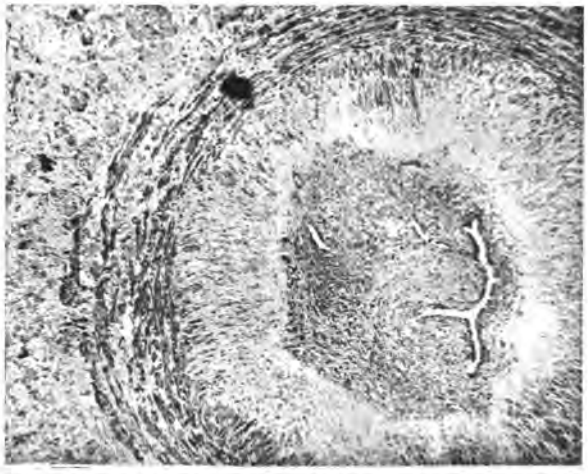


Fig. 3: Photomicrograph of right saphenous vein, showing occlusion of lumen by vascular fibromuscular tissue.

Occlusion of ulnar and/or radial arteries in Buerger's disease occurs in at least 40% of cases [1]. Involvement of vessels proximal to this is uncommon as borne out in studies of a large series of cases by various authors.

De Bakey [2], in a follow-up study of World War II army, cases, found that of 363 upper limbs in patients with Buerger's disease, only 22 of them had brachial artery involvement as determined by diminished or absent pulsation; more proximal involvement was not found. Abramson et al [3] found that in 145 patients with involvement of the uppper limbs, 72 (49.6%) of them had absent pulsations of ulnar or radial arteries, or both, on one or both sides. There was no mention of involvement of the brachial or axillary arteries.

In a study of 14 arteriograms in ten patients with Buerger's disease, McKusick et al [4,5] reported ulnar and/or radial artery occlusion in 11 of them; there was no occlusion of brachial or axillary arteries. In their study of Buerger's Syndrome in the Orient, McKusick et al [6] found one out of 28 patients with absent brachial artery pulsation but the pulse was palpable in the axillary artery. Schatz et al [7] noted diminished or absence of distal pulses of the upper extremity in 22 of 41 patients studied. Diminution or absence of proximal pulses was not recorded.

Since in the studies of various authors occlusion of the axillary artery in association with Buerger's disease has not been reported, it is felt that this case report is worthy of record.

Summary

An uncommon occurence of occlusion of the axillary artery in a young man with Buerger's disease is described. The literature in this respect is briefly reviewed.

Acknowledgements

I wish to thank Dr. J.T. Lambeth for doing the arteriography, Prof. N.K. Yong for operating and performing the biopsies and Dr. K. Prathap for the histological studies. I am grateful to Mr. T.S. Ho of the Medical Illustration Department for the photography.

References

1. Allen, E.V., Barker, N.W., and Hines, E.A. Jr. (1962): Peripheral Vascular Diseases. 3rd Edition, p. 361 W.B. Saunders Co., Philadelphia.
2. De Bakey, M.E. and Cohen, B.M. (1963): Buerger's Disease – A Follow-up Study of World War II Army Cases, p. 37. C.C. Thomas, Springfield.
3. Abramson, D.I., Zayas, A.M., Canning, J.R, and Edinburg, J.J. (1963): Thromboangitis Obliterans: A True Clinical Entity. *Am. J. Cardiol.* 12: 107.
4. McKusick, V.A., Harris, W.S., Ottensen, O.E. and Goodman, R.M. (1962): The Buerger Syndrome in the United States. Arteriographic observations with special reference to involvement of the upper extremities and the differentation from atherosclerosis and embolism. *Bull. Johns Hopkins Hosp.*, 110: 145.
5. McKusick, V.A., Harris, W.S., Ottensen, O.E., Goodman, R.M., Shelley, W.M. and Bloodwell, R.D. (1962): Buerger's Disease – A distinct clinical and pathological entity. *J.A.M.A.* 181, 5.
6. McKusick, V.A. and Harris, W.S. (1961): The Buerger Syndrome in the Orient. *Bull. Johns Hopkins Hosp.*, 190,241.
7. Schatz, I.J., Fine, G. and Euler, W.R. (1966): Thromboangitis Obliterans: *Brit. Heart J.* 28,84.

Bronchography and selective bronchoscopy in diagnosis of lung malignancy: A case report

by A. Galanti

MD, CM, LMCC, CRCP (C), ACR
Foothills Hospital,
Calgary, Alta.,
Canada.
(Visiting Associate Professor, Radiology, Canadian Colombo Plan.)

Wong Wai Kwan

MBBS (S'pore)
Department of Radiology,
University Hospital,
University of Malaya,
Kuala Lumpur.

and

Terence Choy

MBBS (Sydney), MRACP
Department of Medicine,
University Hospital,
University of Malaya,
Kuala Lumpur.

Introduction

WE PRESENT A CASE of particular interest, especially in view of the patient's age and of her good general conditions in contrast to her chest X-ray. Even though the X-ray aroused the suspicion of metastatic deposits in both lungs, the final diagnosis would have not been definite without a combination of bronchography and bronchoscopy. In this particular case, bronchography was of utmost importance as, due to the presence of a constant filling defect at the origin of the main bronchus for the right upper lobe, the bronchoscopist could perform a second bronchoscopy with selective biopsy which gave us finally the definite diagnosis.

Clinical Findings

The patient, a 28-year-old unmarried Indian woman, was admitted to the University Hospital on 1.4.69 with a history of three months of cough productive of scanty whitish sputum and occasional fever. There was no history of haemoptysis or weight loss. The patient was a non-smoker.

The relevant physical findings were confined to the respiratory system with dull percussion note and impaired air entry over the right middle lobe, associated with scattered expiratory rhonchi over both lung fields. No clubbing or lymphadenopathy was noted. Apart from the ESR (18 mm/hr.), laboratory investigations (serological and sputum examination for AFB & fungus) were non-contributory.

The report of the chest X-ray (Fig. A) on admission (1.4.69) was that there were diffuse nodular opacities scattered throughout both lung

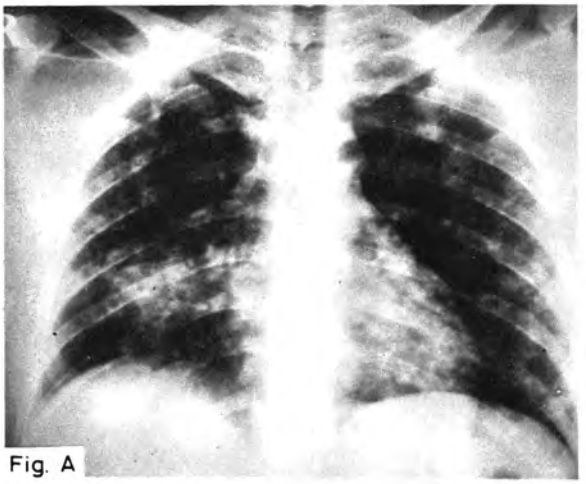


Fig. A

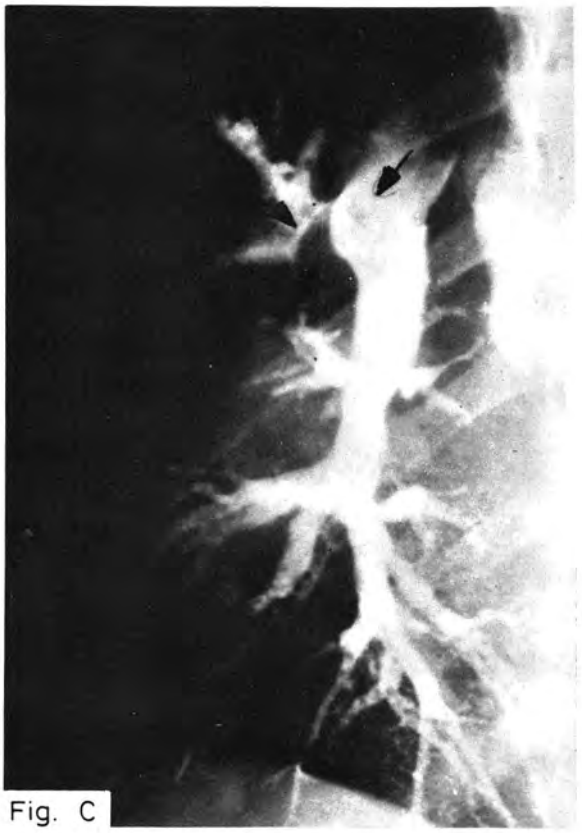


Fig. C

Fig. B

fields. There was a large opacity in the right middle lobe area. The appearances would fit in with one of the following differential diagnosis:

(1)Multiple pulmonary metastases.
(2)Extensive bilateral bronchopneumonia, with developing lung abscess in the right mid zone.
(3)Tuberculous broncho-pneumonia.
(4)Multiple pyaemic abscesses.

A first bronchoscopy was performed on 16.4.69 and the findings were that the trachea was normal,

carina sharp. Left main bronchus and branches normal. Right upper and lower lobe bronchi collapsed. The diagnosis was: collapsed right middle lobe.

A bronchogram was suggested to evaluate further the nature of the collapsed right middle lobe and the diffuse nodular opacities scattered throughout the lungs.

A right bronchogram was performed on 19.4.69 and the findings were that there was a constant well outlined radiolucent filling defect (Figs. B & C) constantly noted at the origin of the main bronchus for the right upper lobe. In view of this finding, a repeated bronchoscopy with particular attention to the origin of the main bronchus for the right upper lobe was strongly suggested. There was no filling of the bronchi for the right middle lobe.

As a result of the right bronchogram report, a repeat bronchoscopy was done on 30.4.69. The findings were that the right upper lobe broncho-orifice was clear. Just beyond the latter, the superior wall was seen bulging into the lumen. No actual tumour was seen. A biopsy was taken from this area.

The histological report was that a section of the specimen showed masses of tumour cells arranged in irregular clumps and cords and separated by scanty fibrovascular stroma in which many eosinophils and some plasma cells were present. The tumour cells were polygonal in shape, having a moderate amount of eosinophilic cytoplasm and having large irregular hyperchromatic nuclei with prominent nucleoli showing many mitotic figures. In an occasional area, intercellular bridges were seen. However, there was no keratinisation. The histological diagnosis was: moderately well-differentiated non-keratinising squamous cell carcinoma.

Summary

We present an interesting case of lung malignancy in a young Indian patient, aged 28, in good general condition. Her chest X-ray was suggestive of possible metastatic deposits in both lungs. A constant, well-defined, small-filling defect at the origin of the main bronchus for the right upper lobe demonstrated by bronchogram, led the bronchoscopist to perform a second bronchoscopy and selective biopsy, on the basis of which the final diagnosis was obtained.

Acknowledgements

We wish to express our gratitude to Dr. H.O. Wong, Head, Department of Medicine, Faculty of Medicine, University of Malaya, for kind permission to report this case, and to Professor N.K. Yong, Head, Department of Surgery, Faculty of Medicine, University of Malaya, for performing the bronchoscopic examinations. Our thanks also to the Department of Medical Illustration, Faculty of Medicine, University of Malaya, for its photographic facilities, and to Miss Janet Low for her technical assistance.

References

1. Carlisle, J.C., McDonald, J.R. and Harrington, S.W. (1951): "Bronchogenic Squamous Cell Carcinoma", *J. Thoracic Surg.* 22: 74-82.
2. DeRienzo, S. (1949): "Radiologic Exploration of the Bronchus", Springfield, Charles C. Thomas.
3. Farinas, P.L. (1934): "Serial Bronchography in the Early Diagnosis of Bronchial Carcinoma", *Am. J. Roentgenol.*, 32: 757.
4. Wierman, W.H., McDonald, J.R. and Clagett, O.T. (1954): "Occult Carcinoma of the Major Bronchi", *Surgery* 35: 335.
5. Wilt, K.E., Andrews, N.C., Meckstroth, C.V., Molnar, W. and Klassen, K.P. (1959): "The Role of Bronchography in the Diagnosis of Bronchogenic Carcinoma", *Dis. Chest*, 35: 517.
6. Woolner, L.B., Anderson, H.A. and Bernatz, P.E. (1960): "Occult Carcinoma of the Bronchus: A Study of 15 Cases in Situ of Early Invasive Bronchogenic Carcinoma. *Dis. Chest*, 37: 278.

The syndrome of hyperosmolar non-ketotic diabetic acidosis following craniotomy: A case report

by
Nadason Arumugasamy
MBBS (Mal), MD (S'pore), FICS
and
Edir B. Siqueira
MS, MD

(From the Division of Neurological Surgery of the Chicago Wesley Memorial Hospital, and Department of Surgery of Northwestern University Medical School).

(This study was carried out with the aid of Training Grant No. NB-5408 from the National Institute of Neurological Diseases and Stroke of the U.S. Public Health Service.)

SINCE 1957, when the syndrome of non-ketotic hyperosmolar coma was first described in a diabetic [9] well over 100 cases have been reported. The 32 cases of Danowski and Nabarro [3] and the 63 cases reviewed by Schwartz and Apfelbaum [10] are two of the larger series. The majority of cases have been in patients with severe infections, extreme burns [2,5,8] or problems involving the pancreas, usually a pancreatitis [6] or carcinoma. However, there has been insufficient emphasis of this syndrome in surgical literature.

Ashworth et al described two patients who developed this syndrome – one with burns covering 20% of the body surface and the other, a patient with Pemphigus Vulgaris. None of the patients underwent a major surgical procedure. However, they did draw attention to the relationship of this syndrome to certain surgical problems.

Once the syndrome is well developed, the prognosis is poor. Mortality rates of 44% [4] and 41% [10] have been reported. Recently, following a frontal craniotomy and near total excision of a suprasellar meningioma, one of our patients developed this syndrome. She became comatose on the 24th postoperative day. She was fortunate in revovering from the metabolic derangement.

This case is being reported to draw the attention of surgeons to this syndrome. Moreover, it is the first reported case of its kind to follow an intracranial

surgical procedure.

Early recognition of the hyperosmolar non or mildly ketotic patient is imperative if either the resultant hypovolemic state or the state of coma is to be avoided. Examination of the blood sugar and careful check of the electrolyte status are indicated post-operatively in susceptible patients. An outline of the treatment rendered is also given. The metabolic mechanisms responsible for the syndrome are briefly discussed, with particular reference to the case presently being reported.

Case Report

The patient is a 56-year-old right-handed white woman. She was admitted to the Chicago Wesley Memorial Hospital on February 11, 1969. Essentially, she complained of progressive loss of vision in her left eye over an eight-year period. Three years previously, she had become blind in that eye. She was seen by an ophthalmologist at that time. He advised hospitalisation for "some tests". Being fearful of possible surgery, she did not return to see her doctor.

A year prior to admission, she noticed that the vision in her right eye was being affected. She began bumping into objects to the right of her. In January 1969, she was unable to read her newspapers. She sought medical treatment the same month.

There was no history of headaches, diplopia, cold intolerance, recent weight gain polyuria or polydipsia. She had reached her menopause ten years previously. The past history was insignificant. She had been in good health previously, prior to the onset of her visual complaint.

On examination, she was a rather short (height 4' 11") somewhat obese female, weighing 150 pounds. Mentally she was dull. She was oriented to time and place. In the neurological examination, the main findings were in the visual system. She was blind in her left eye, there being no light response both directly and consensually. Both pupils were dilated to four millimeters. Visual acuity on the right was a paltry 2/100. Her visual fields are illustrated (Fig. 1). Funduscopy revealed bilateral optic atrophy. The left fundus was more severely affected. There were no long tract signs and no pathologic reflexes.

Review of her remaining systems was unremarkable. Her blood pressure was 140/70 millimeters of mercury.

Laboratory investigations: Hematocrit was 42 (hemoglobin 13.7 gms.%). Total white blood cell count was 5,600 – 46% polymorphonuclear leukocytes and 42% lymphocytes. Blood serology (VDRL) was negative. Urine specific gravity was 1.005 and the rest of the examination was unremarkable. Serum electrolytes were as follows: Sodium 144 mEq./L, Potassium 4.1 mEq/L, Chlorides 102 mEq/L, $c0_2$ combining power 27 vol.%. The 24-hour urine, 17-keto and ketogenic steroids and T4 uptake were normal. Blood urea nitrogen (BUN) was 20 mgm%. Fasting blood sugar was 125 mgm%.

Radiologic studies: Skull X-rays were normal and unremarkable. Radioactive brain scan with Technetium 99^m revealed an increased area of isotope uptake in the suprasellar area, both in the anteroposterior and lateral projections. Bilateral cerebral angiography was performed. This study confirmed the presence of a suprasellar tumor. There was a stretching and elevation of the first portions of both anterior cerebral arteries and a displacement laterally of the left carotid artery in its intracranial portion. A suprasellar vascular "blush" could be discerned in the late venous phase.

On 2-17-69, a left frontal craniotomy was performed, following the infusion of 500 ml 20% Mannitol and a lumbar puncture for continuous spinal drainage. Preliminary elevation of the left frontal lobe revealed a circumscribed tumor on its under aspect. A left frontal lobectomy was then carried out delineating the tumor well. All the tumor was then removed but for a small fragment attached to the left carotid artery. Both optic nerves were found to be considerably flattened, discolored and displaced lateral to their normal locale. The main feeding vessels to the tumor entered its medial aspect and were clipped and divided. It is entirely possible that some of these vessels contributed to the blood supply of the diencephalon. When the tumor was removed, it was also evident that its bed was partly formed by the hypothalmus.

Postoperative course: She was started on steroids (Dexamethazone 6 mgm every 6 hours). Within 24 hours, she developed diabetes insipidus. On the day following surgery, she passed 900 ml. of urine with a specific gravity of 1.0003 in a little over an hour-and-one-half. She required Pitressin. On the seventh postoperative day, the steroids that had been tapered previously were discontinued. At this time, Cortisone replacement was begun (25 mgm. Cortisone a.m. and 12.5 mgm. p.m.).

Neurologically, she was able to talk and eat by this time. In her affect, she was "frontal lobish". She moved all her extremities at request. In the second post-operative week, her appetite was excellent. She ate voraciously everything given to her. However, on the 21st postoperative day, her appetite palled and

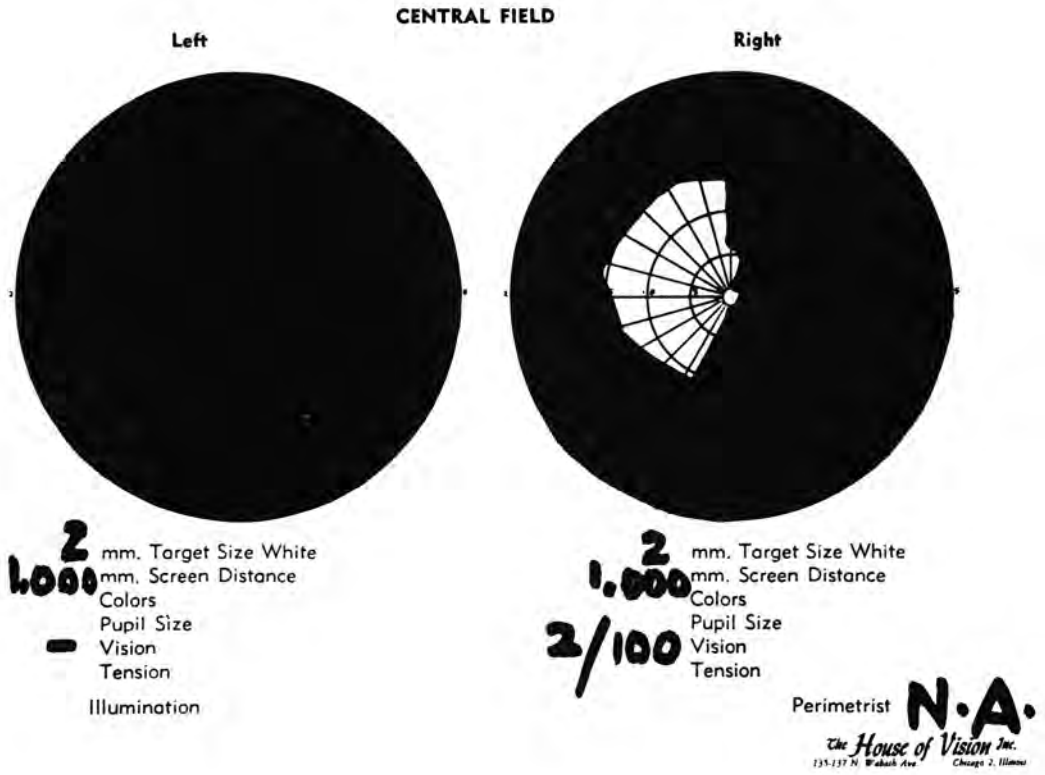
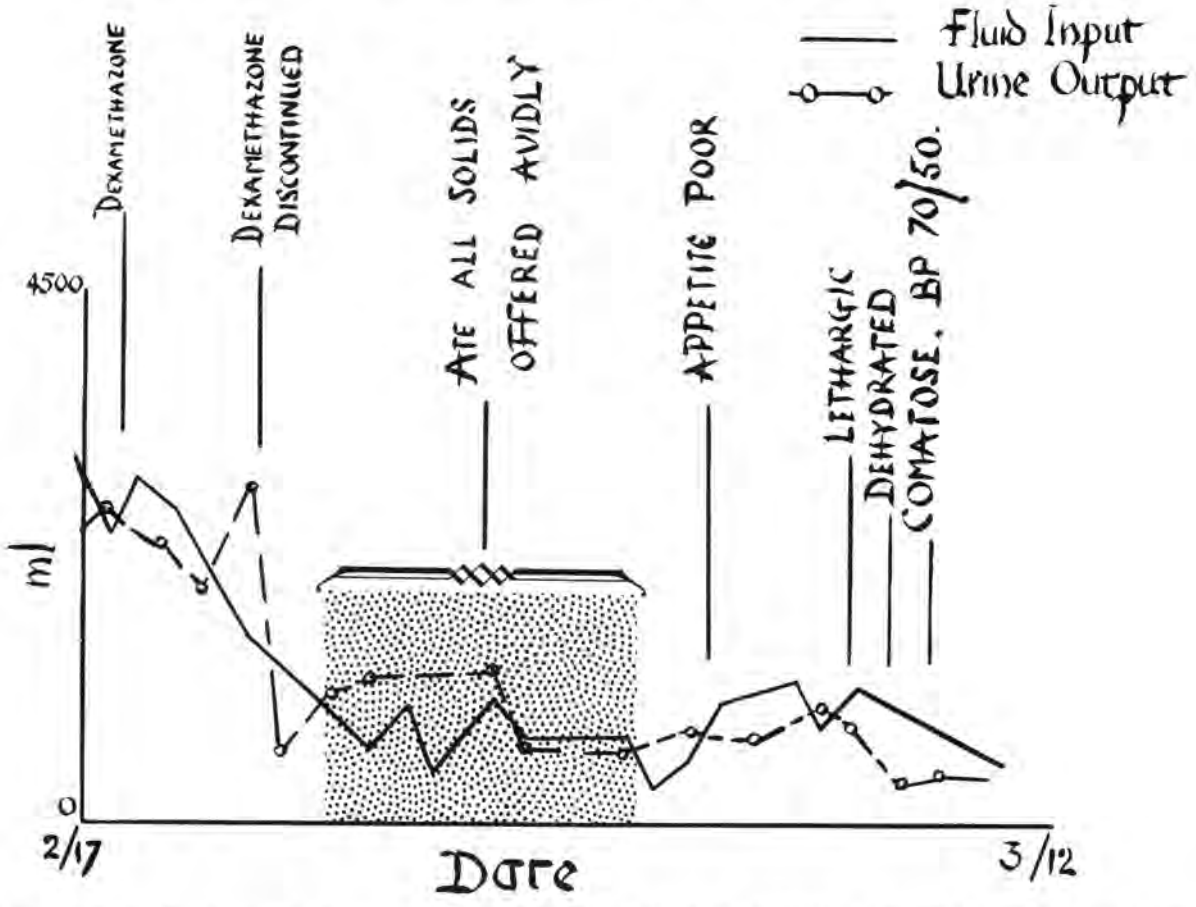


Fig. 1: **A copy of the visual fields and visual acuity in our patient as determined on 2.12.69.**

Table I indicates the serum electrolytes, blood sugar and blood urea values on the dates indicated.

Date:	Blood Sugar	Blood Urea	Serum Electrolytes			
			Na	K.	C1.	CO2
2-12-69	125	20	144	4.1	102	27
2-19-69	175	28	140	4.2	101	24
2-22-69			157	3.9	98	24
3-11-69	1,230	98	163	4.2	128	19
3-12-69 A.M.	900	78	137	5.2	111	13
P.M.	840	76	123	6.1	90	9
3-13-69 A.M.	280		128	4.3	101	14
P.M.			125	5.2	99	14
3-14-69	375	40	125	3.4	98	23
3-15-69	370		132	3.2	99	15
3-16-69	230		142	4.5	108	16
3-18-69	230	48				
3-19-69			152	9.2	118	20
3-20-69			144	4.4	112	20
3-21-69	225	30	139	4.4	113	19
3-27-69	225	25	146	4.1	110	20

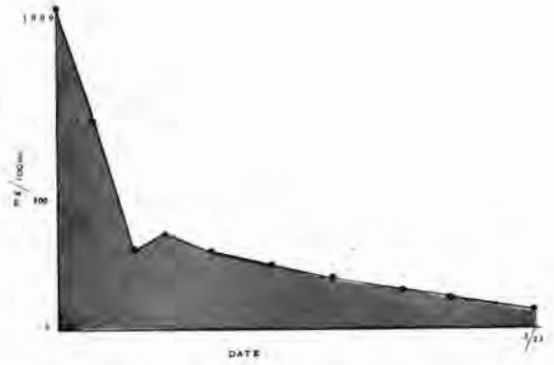


Graph I showing fluid input and urinary output from 2/17/69 to 3/12/69. The temporal occurrence of some pertinent events that led to her comatose state are also indicated.

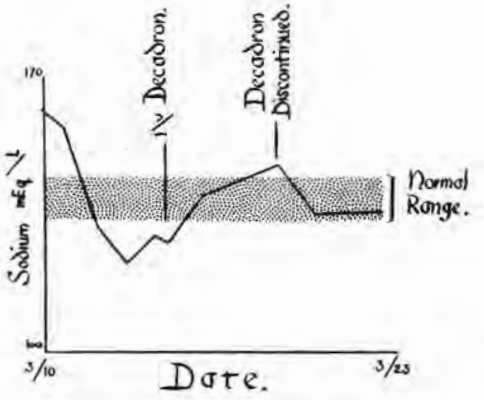
she refused all solids. She drank only fluids and this quite inadequately. Two days later, she became somewhat somnolent (Graph 1). Examination of her serum electrolytes revealed a hypernatremia with a Sodium of 163 mEq/L (Table I). The following morning, when these results became available, she was not responding to verbal stimuli. She was in a coma responding only to deep pain. Examination of her urine revealed 4+ sugar with a faint trace of acetone. Determination of blood sugar gave the phenomenal figure of 1,230 mgm%. Serum osmolality was 432 mOsm. (normal = 280 mOsm). This, with the hyperna tremia in the face of a comatose patient, prompted the diagnosis and immediate corrective treatment. At this time, she was dehydrated, with a blood pressure of 70/50.

Graphs II and III depict the blood sugar and serum sodium patterns respectively during her treatment. A blood sugar level of over 1,000 mgm%, and a BUN of 98 mgm% indicated that renal damage was present[6]. She was treated with regular insulin and hypotonic (0.45N) saline, followed three days later with water via a nasogastric tube. She was carefully followed with serial blood sugar and serum electrolyte estimations, two to three times a day. These were done until her dehydration was corrected and the blood sugar had reached levels which were nearly normal.

Some four days after the onset of her coma, she developed generalised edema due possibly to water overload in the face of poor renal function. She ceased to "put out" urine. Edecrine (50 mgm.) was given intravenously. At this time, she developed a respiratory stridor. Laryngoscopy revealed edema of the larynx, and this rapidly cleared following Dexa-



Graph II indicates the serum blood sugar levels and their trend with treatment after the onset of her coma.



Graph III represents the serum sodium levels during treatment. The time I/V Decadron was given corresponds to the time of her laryngeal edema.

methazone (dose – 4 mgm intravenously every eight hours). It will be evident from Graph III that this induced a hypernatremia which cleared when the steroid was discontinued four days later.

Presently, the patient continues to require Lente insulin 20 units daily. There is no glycosuria. Her blood sugar is in the range of 180 mgm% – 200 mgm%. She awaits placement in a nursing home.

Discussion

In the majority of cases reported to date, this syndrome was associated with diabetes mellitus of adult onset. In 65% of the 63 patients in one series, the development of this syndrome was the first manifestation of the diabetic state. In our patient, the fasting blood sugar level of 125 mgm% at the time of admission, perhaps, should not have been overlooked. It was interpreted as being high normal. In addition to this initial high level of blood sugar, several other factors contributed to the development of the hyperosmolar state. Amongst these were the use of steroids post-operatively, the ketone sparing effect of increased consumption of carbohydrate in the second post-operative week, the diuresis, and the poor fluid intake due to an absent or inadequate response to thirst.

Serum osmolality rises as a direct linear correlate of the blood sugar (180 mgm. glucose = $\frac{180}{18}$ = 10 m osmoles). As blood sugar levels reach proportions of 850 – 1,000 mgm% or more, the kidneys are unable to handle the osmotic load. The usual range of blood sugar levels in the reported cases is between 690 – 1,200 mgm% with a mean blood sugar of 910 mgm%.[10] At these levels, there is little reabsorption of water by the kidneys, and water is lost at the expense of sodium and urea, adding further to the hyperosmolar state. That sodium and urea increase osmolality [11] is well illustrated by the formula:

Plasma osmolality = 2 (sodium + potassium concentrations + $\frac{\text{glucose (mgm\%)}}{18}$ + $\frac{\text{BUN (mgm\%)}}{1.4}$)

On March 11, 1969, the serum osmolality in our patient was 432, sodium was 163 mEq/L, potassium 4.1 mEq/L, serum glucose level of 1,230 mgm% and a BUN of 98 mgm%. Based on the above formula, serum osmolality estimation confirms the role of the electrolytes and urea and sugar in increasing the hyperosmolar state.

Treatment should be directed toward the hyperglycemia and the hypovolemia. If the hyperglycemia is treated by the judicious use of regular insulin, then adequate and correct type of fluid replacement will reduce the blood glucose values to acceptable levels. Potassium replacement should not be overlooked during this period. The choice of fluid should be such as not to induce hemolysis of red blood cells. A 0.45 N saline solution is ideal for this purpose. Alternately, water may be given via a nasogastric tube. Water is to be preferred as it does not increase the hyperosmolality while making good the electrolyte imbalance.

A central venous pressure catheter is advised in

patients with hypotension and hypovolemic states until clinical improvement occurs. Our failure to do so earlier resulted in water overload, no doubt due to the renal damage present. If the blood sugar level is over 1,000 mgm%, renal impairment is almost definite to be present . As the hypotension is a reflection of the state of dehydration, it needs no specific therapy outside of the correction of the dehydration.

That steroids aggravate the condition is evident in our case when it was given for four days to combat laryngeal edema. This induced a significant hypernatremia in our patient which corrected itself once the steroid was discontinued (Graph III).

If lactic acidosis is evident, correction with bicarbonate may be necessary.

The frontal lobectomy on her dominant side accounted for her apathy and some of the disorientation. It would be easy to account for some of her lethargy and hyperhagic state by attributing it as being secondary to the lobectomy. Failure to recognise the syndrome early almost led to her demise. Its possible occurrence in the obese, latent diabetic is emphasised. Diagnosis will be established by the extremely high blood sugar levels without ketosis, and hypernatremia in a patient with progressively decreasing sensorium. Once recognised, there should be no delay in therapy if the quality of the survival is to be enhanced.

Summary

1. A case of hyperosmolar non-ketotic diabetic acidosis is described in a patient following craniotomy and removal of a suprasellar tumor.
2. An awareness of its possible occurrence is important to surgeons if it is to be prevented and adquately treated in the post-operative patient.
3. Its treatment is briefly discussed. Early recognition and treatment can hope to reduce the high mortality and morbidity attendant with this condition.
4. That the hypothalamus may play a role in it is suggested and needs further investigation.

BIBLIOGRAPHY

1. Ashworth, C.J., Williams, L.F. Jr., Byrne, J.J. Hyperosmolar hyperglycemic non-ketotic coma: Its importance in surgical problems. *Ann. of Surg.,* 167: 556–560, 1968.
2. Bailey, B.N. Hyperglycemia in burns. *Brit. Med. Journ.* 5215: 1782–1785, 1960.
3. Danowski, T.S. and Nabarro, J.D. Hyperosmolar and other types of non-ketoacidotic coma in diabetes. *Diabetes,* 14: 162–165, 1965.
4. DiBenedetto, R.J., Crocco, J.A., and Soscia, J.L. Hyperglycemic non-ketotic coma. *Arch. Int. Med.,* 116: 74–82, 1965.
5. Evans, E.I., and Butterfield, W.J.H. Stress response in severely burned. *Ann. Surg.,* 134: 588–613, 1951.
6. Hamlos, P.B., Nelson, J.K., and Lowry, R.C. Hyperosmolar non-ketoacidotic coma in diabetes. *Lancet,* 1: 675–679, 1966.
7. Rosen, H. and Glicks, S. Letters to the editor. *Lancet,* 1: 1101, 1966.
8. Rosenberg, S.A., Brief, D.K., Kinney, J.M., Herrera, M.A., Wilson, R.E., and Moore, F.D. The syndrome of dehydration coma and severe hyperglycemia without ketosis in patients convalescing from burns. *New Eng. J. med.,* 272: 931–938, 1965.
9. Sament, S. and Schwartz, M.B. Severe diabetic stupor without ketosis. *South African Med. Journ.,* 31: 893–894, 1957.
10. Schwartz, T.B. and Apfelbaum, R.J. *Non-ketotic diabetic coma.* Yearbook of Endocrinology, 1965–1966, *pp 166–179, Yearbook Medical Publishers, Chicago.*
11. Tyler, F.H. Hyperosmolar coma. *Editorial, Amer. J. Med.,* 45: 485–487, 1968.

Book Reviews

IMMUNOLOGY FOR STUDENTS OF MEDICINE

Humphrey, J.H. and R.G. White. 3rd Edition (Low – priced Edition) English Language Book Society Oxford and Edinburgh. Price (U.K.) 20 s.

AS A VETERAN of several readings of Humphrey and White's "Immunology for Students of Medicine" in its second edition, I feel pleased and privileged to review the long-awaited third edition.

Since the last edition, in 1964, remarkable new developments have widened and compounded the field of medical immunology. The roles of individual cells in the immune response, thymus function, tissue transplant immunology, and **in vitro** cellular immunity are but a few of the new expansions. Fresh data constantly challenge and force modification of older hypotheses. And each new explanation seems more complex than its predecessor.

Medical people and biologists in general must have some understanding of immunology to appreciate better such diverse topics as host-parasite relationships, growth and retardation of tumours, disease pathogenesis, and to some extent even evolution and ecology. Indeed, immunology is fundamental to biology and medicine.

In clear, readable language, the authors describe the immunological basics, non-specific immunity, specific immune responses, antibodies, cell-mediated immunity, immune tolerance,, complement, antigens and antigen-antibody reactions. They then discuss in some detail physiological and pathological aspects of immunology: aberrations in immunoglobulin production, immune protective mechanisms, hypersensitivity, tissue transplants, tumour growth and regulation, auto-immunity, and vaccination and serotherapy.

Although the book is fairly encyclopaedic, the writing style remains tolerable. Individually important but collectively tedious literature citations are omitted in favour of a limited list of salient, usually comprehensive reference articles at chapter endings. Frequent tables, diagrams, and photographs help to clarify and reinforce the text.

The book does not presuppose prior knowledge of immunology on the student's part. Careful reading and study of the text (plus noting some of the references) could adequately teach a medical or biology student basic immunology. However, the book is at a high level and would capably refresh and enlarge upon the knowledge of those who might have studied immunology in the past.

In view of the rapid and constant changes in immunology and the consequent need for frequent updating of textbooks, not to mention students' customary financial status, the new low-priced edition is particularly welcome. "Immunology for Students of Medicine" is a useful text. It should be read and reread, marked up and underlined, not handled reverently and soon shelved. The paperback edition is very suitable.

T.J. Dondero, Jr.

MORTALITY FROM MALIGNANT NEOPLASMS: PARTS I & II 1955 – 1965.

World Health Organisation, Geneva, 1970. Bilingual edition (English and French) pp. 1147. Price: £11.

AMONG ITS NUMEROUS functions, the World Health Organisation undertakes the systematic collection, presentation and dissemination of epidemiological information, and statistical studies on morbidity and mortality.

Malignant neoplasms rank high as a cause of death in many countries of the world and the detailed numerical information on this important health problem should satisfy the many research workers in this field.

An automatic information system on mortality since 1955 from malignant neoplasms by age, sex and site had been set up by W.H.O. using the International Classification of Diseases (1955). This data is presented in this publication to cover the period 1955 – 1965, thus permitting an observation of trends over a decade. A table showing the available data on population by sex and age has been added to allow computation of rates.

Unfortunately, this publication does not include Malaysia. Nevertheless, it should prove a valuable source of information for those engaged in meeting one of the greatest challenges to medical research today.

SEX AND MORALS

C.H. and Winifred M. Whiteley 1967
B.T. Batsford Ltd. Lond. pp. 135, 21s. net.

THIS IS ONE of a series of introductory volumes examining the philosophy and history behind man's most important social, political and moral ideas under the general editorship of Maurice Cranston.

The authors examine the principal types of sexual morality and their roots in the patriarchal, puritan or romantic attitudes of the past and the present to determine the type most suited to the modern society.

They suggest that human society needs a morality of sex, even in this permissive age, to supply the mechanism of family life. If human sexual behaviour were seasonal, if pregnancy lasted a few weeks only and the human infant were as quick to reach independence as a kitten does, there would be no more need for sex morality among us than there is among cats. The best place for sexual experience clearly is within a happy marriage, but it would be altogether too dogmatic to conclude that this is the only proper place for it. The modern publicity given to sex tends to create the belief not only that sexual experience is an important thing (which is obvious) but that for most people it is the supremely important thing, so that nobody can live a satisfactory life that is not centred on it.

PROCEEDINGS OF THE FOURTH SINGAPORE-MALAYSIA CONGRESS OF MEDICINE

Edited by K.K. Tan & Published by the Academy of Medicine, Singapore. 1969. pp. 529 + xxvii

THE ORGANISERS of this fourth Congress deserve to be congratulated on getting more than 150 people to contribute about 100 papers covering a wide range of subjects of interest to the medical profession.

They set a high standard and it is not surprising that the participants at the Congress came not only from Malaysia and Singapore but also from Australia, Canada, Hongkong, Japan, New Zealand, Pakistan, Philippines, Taiwan, Thailand and the United Kingdom.

The attractively printed volume will be a valuable addition to the book shelves of all libraries and medical workers interested in medicine (in its widest term) of this part of the world.

CONTROL OF HUMAN FERTILITY

Edited by G.I.M. Swyer, British Med. Bull. Vol. 26 No. 1 1970. The British Council, 97 & 99 Park St. London. Price: £2

FERTILITY CONTROL is a subject of growing importance in view of the greatly increased survival rate of man, leading to population growth beyond our ability to maintain satisfactory standards of living. Fertility control is also essential for the limitation and spacing of births in the best interests of the family.

As pointed out in this introduction by Sir Alan Parkes, one of the world's leading authorities on the subject, fertility control is necessary for both the national welfare and individual happiness. Because of its great importance and the rapid expansion and development of its technology, this authoritative review by 19 distinguished British workers is most timely and welcome. It should have a wide appeal, not only to family planners and gynaecologists, but also to physiologists, pharmacologists and endocrinologists.

RECENT RESEARCH ON THE RETINA

Edited by E.S. Perkins. British Med. Bull. Vol. 26 No. 2 1970
The British Council, 97 & 99 Park St. London. £2

THE GREAT TECHNOLOGICAL advances of modern times have made possible a fuller and deeper appreciation of the intricacies of the structure, function and pathology of the retina. The British Medical Bulletin has done a great service to the profession by bringing a number of distingusihed British authorities in their respective fields to review the recent advances in our knowledge of the structure and function of the retina and the grave visual disorders resulting from its impairment in disease.

This publication would be welcomed by all ophthalmologists, neurophysiologists and pathologists.

"TEXTBOOK OF OPERATIVE SURGERY"

Eric L. Farquharson – 4th Edition 1969
E & S. Livingstone Edin. pp. 972, 1,049 illns. £7/-

MANY BOOKS ON Operative Surgery have appeared in recent times, but "Textbook of Operative Sur-

gery", by Eric L. Farquharson, has kept its place through the years as an acknowledged classic and reference volume in surgery.

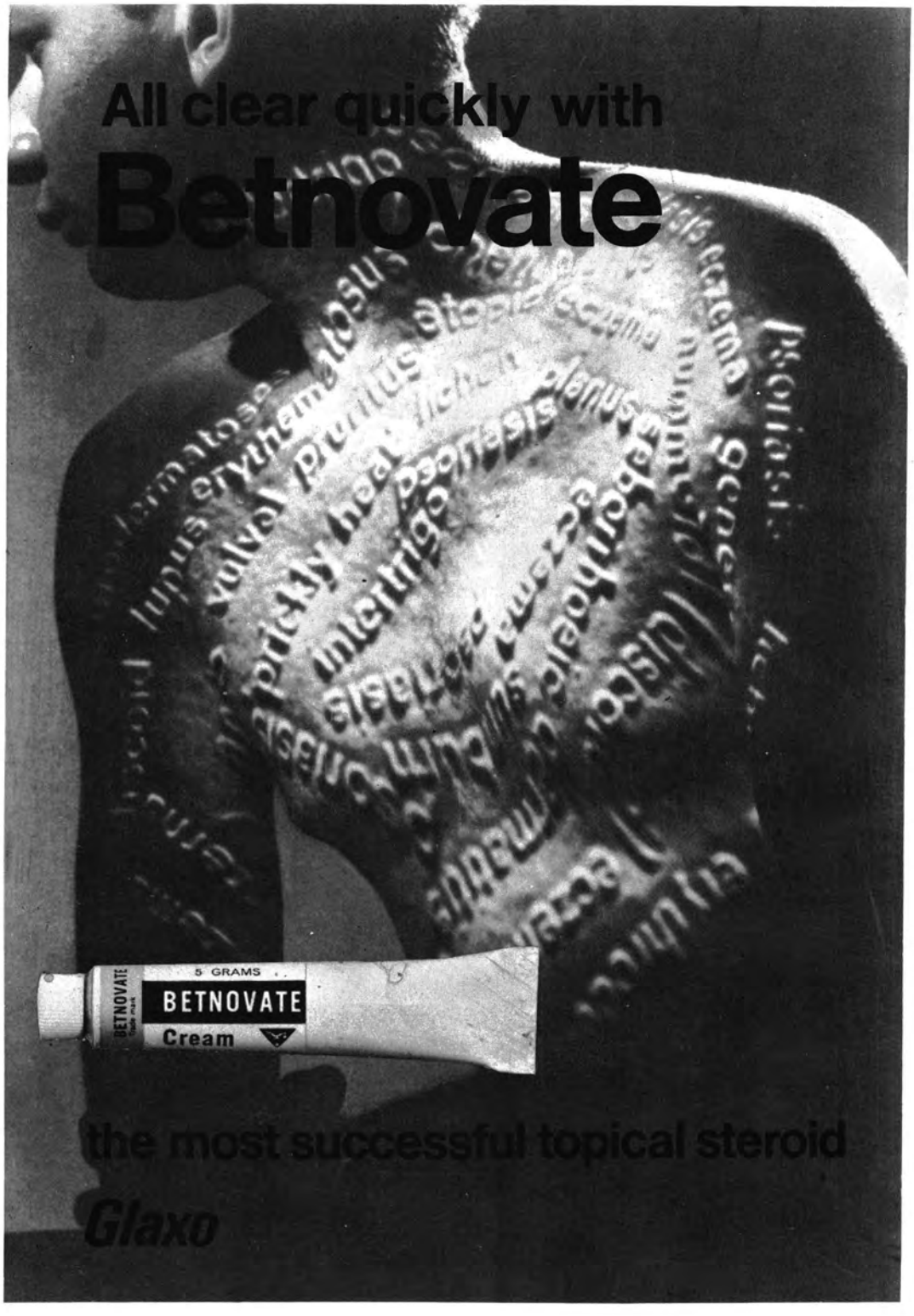
The great advantage of the book is that unlike many others on the subject, the whole field of operative surgery has been covered by one author, an experienced general surgeon and an acknowledged teacher. Both general surgery and the specialities are treated alike to produce a balanced perspective of the whole field of operative surgery, ideal for the surgical trainee and eminently suitable for the postgraduate student.

The young surgeon in training will find invaluable help in this book, as it covers almost every aspect of operative surgery that he is likely to face; it tells him precisely how to deal with every situation he is likely to meet. For the students, the classical presentation of surgical anatomy, indications and contra-indications, pre- and post-operative management, together with the profusely illustrated description of the actual operation itself, makes the book an invaluable companion in his preparation for higher surgical degrees.

The fourth edition of the book has been brought out by the English Literature Book Society, in a very much cheaper form while maintaining the excellent standard of text and illustrations, bringing this valuable surgical work well within the means of every medical student.

There is no doubt that Farquharson's Operative Surgery will find a prominent place in every medical library and will continue to be the popular work that it has been, not only with the students, but with registrars and aspiring young surgeons. The latest edition continues to maintain its world-wide reputation of being an outstanding work on operative surgery.

K.A. Menon


All clear quickly with
Betnovate
5 GRAMS
BETNOVATE
Cream
BETNOVATE
the most successful topical steroid
Glaxo