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CONTENTS

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Editorial

Regional Cooperation

by A.A. Sandosham

THE VALUE OF INTERNATIONAL conferences and seminars on medical subjects participated by world authorities is well recognised. Diseases and vectors of diseases are no respecters of political boundaries and the rapid means of transport available today make the introduction of exogenous ailments more frequent. However, the high cost of travel to and from a foreign country and subsistence there militates against organising such conferences as frequently as desirable.

Regional Meetings

One way of minimising this disadvantage is to hold similar smaller meetings at the regional level at much less cost to the organisers and participants. Not only will it be possible to hold more frequent meetings but there is the additional advantage of being able to concentrate on diseases peculiar to the region. We, in Southeast Asia, for instance, are not afflicted by conditions like yellow fever, sleeping sickness or Chagas diseases. We can, therefore, afford to leave out the detailed consideration of such conditions at our regional seminars and conferences and instead share experiences of workers in this region of the problems connected with those diseases that prevail here.

Caribbean Confederation

Associated with the biennial Council meetings of the Commonwealth Medical Association are seminars and scientific sessions with participants from different parts of the Commonwealth. At the Fifth Council meeting of CMA held the year before last in Kuala Lumpur and Singapore, the need for meetings at greater frequency than once in two years was recognised and the suggestion was made that the Commonwealth countries should be subdivided into regions and that there should be regional seminars in the intervals between the biennial meetings of the Council. This suggestion was followed up by the Commonwealth countries of the in Jamaica last November and attended by Dr. A.L. Gwee and myself from this region. The formation of the Commonwealth Caribbean Medical Council

was made possible by the boundless energy and enthusiasm of Dr. M. Beaubrun, the secretary of the Medical Association of Jamaica, who was also the chairman of the first Caribbean Medical Conference.

Regional Cooperation in Southeast Asia

The question arises as to whether we should do something on those lines in this part of the world. The situation here, however, is somewhat different. The need for regional cooperation has long been recognised by the medical fraternity in this zone. We have regular conferences and seminars organised by the Central Coordinating Board for Tropical Medicine of the Southeast Asian Ministers of Education Organisation, the Confederation of Medical Associations of Asia and Oceania, the Medical Section of the Pacific Science Congress, the World Health Organisation and the like. There is also the recent proposal to form a Southeast Asian Medical Association sponsored by the different governments of the region. Besides, there is close liaison between the neighbouring countries, facilitating attendance at medical meetings organised by each other. For instance, this year the Singapore Medical Association and the Malaysian Medical Association are cosponsoring the 3-day seminar on "Trends in Medicine" to be held in Singapore. Several of the National Medical Associations are affiliated to one another and representatives attend each other's annual general meetings and associated clinical and scientific sessions. Whether, in view of the situation in this region, there is such an urgent need to organise regional meetings of the Commonwealth countries in Southeast Asia is debatable although if the necessary finances would be forthcoming, the bringing together of medical men, especially those from Ceylon and India, would certainly help advance the cause of medicine.

Review of Cholera in Malaysia (1900—1970)

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THE HISTORY of cholera in Malaysia, like other countries in the region, dates back to antiquity but the earliest known records of the disease appear in the 1828-30 records of the Durian Daun Hospital in Malacca (Sandosham, 1964), and in the writings of Mrs. Innes (1885) who lived in a remote kampong at Langat, Selangor. Another outbreak in a crowded Chinese junk on the high seas is depicted in the writings of Sir Hugh Clifford (1913) who based his story on an actual occurrence. This was the arrival at Port Swettenham (now Port Klang) in 1896 of Chinese junks which had sailed down from the China coast and had been refused admission to the port of Deli, Sumatra, due to cholera amongst the crew. With a view to convince the Klang authorities that the junks were no longer carriers of cholera cases, the survivors on board the junks, before reaching Port Swettenham, threw overboard their recent dead, the comatose and many in the early stages of the disease. At this stage, it would appear the wind dropped and the current carried the junks into port surrounded by bobbing shark-jostled corpses as if the dead were following silently to accuse the living. Even so, when the seemingly healthy survivors were quarantined on board for six days, the records show that 57 further cases developed and out of these, 38 died.

Since its establishment in 1900, the Institute for Medical Research, Kuala Lumpur, has played an ever-increasing important role in the investigation of tropical diseases and there has been an efficient linkage with the health authorities resulting in ready facilities for cholera investigation. A comprehensive review of cholera in Malaysia up to 1950 by Green (1951) appears in the IMR Studies No. 25. From time to time reports on cholera have appeared in the annual reports of the Institute (1915, 1920, 1925, 1928, 1938, 1961, 1963, 1964, 1965, 1968, 1969 & 1970). Since 1928, the Institute has been responsible for the production of cholera vaccine to meet the country's needs.

Malaysia, like other countries, has had its fair share of the pandemics, which originated from the Ganges delta, the home of cholera. Prior to 1817, there were no records of its spread to the rest of the world. Cholera first appeared in Malaysia in May 1819 during the first pandemic. The original site of entry was at Malacca and it recurred in December 1819, continuing to February 1820. In October 1819, the epidemic cholera also appeared in Penang and the disease is said to have been carried overland through Burma and Thailand. The disease in Penang spread rapidly and according to Ward and Grant (1830) the mortality was consi-

derable. The Indians and the Malays were the greatest sufferers. There were between 40 to 50 deaths daily. The Chinese were not spared either.

In 1895, according to Rodger (1896), just prior to the installation of the Kuala Lumpur water supply, 126 inmates of the prison in Kuala Lumpur contracted cholera and, of these, 68 died. There was a similar outbreak in the Taiping Gaol in 1911.

The earliest record of a cholera epidemic in Singapore dates back to 1841-1842, i.e. just prior to the third pandemic of 1846-1862. Subsequent epidemics occurred in 1851, 1862, 1873-1874, 1895-1896, 1900-1903, 1910-1914 (average 170 cases yearly) and 1924-1928 (average 15 cases a year). From 1910 to 1928, a total of 1,531 cholera cases were quarantined at Singapore from ships calling there. From 1929 to 1941, there were no cases of cholera in Singapore town or at the quarantine station. In August 1943, a Japanese ship arrived in Singapore with 50 cases of a cholera-like disease on board, and was quarantined at the Seletar base. There were eight deaths. While steaming in Singapore waters, the ship jettisoned vegetables which were recovered and consumed by Malay fishermen. Five days later, there were cases of a similar cholera-like disease amongst the fishermen and their families. Cholera vibrios recovered from the dead Malays and the Japanese were identical in bacteriological properties. Similar strains isolated

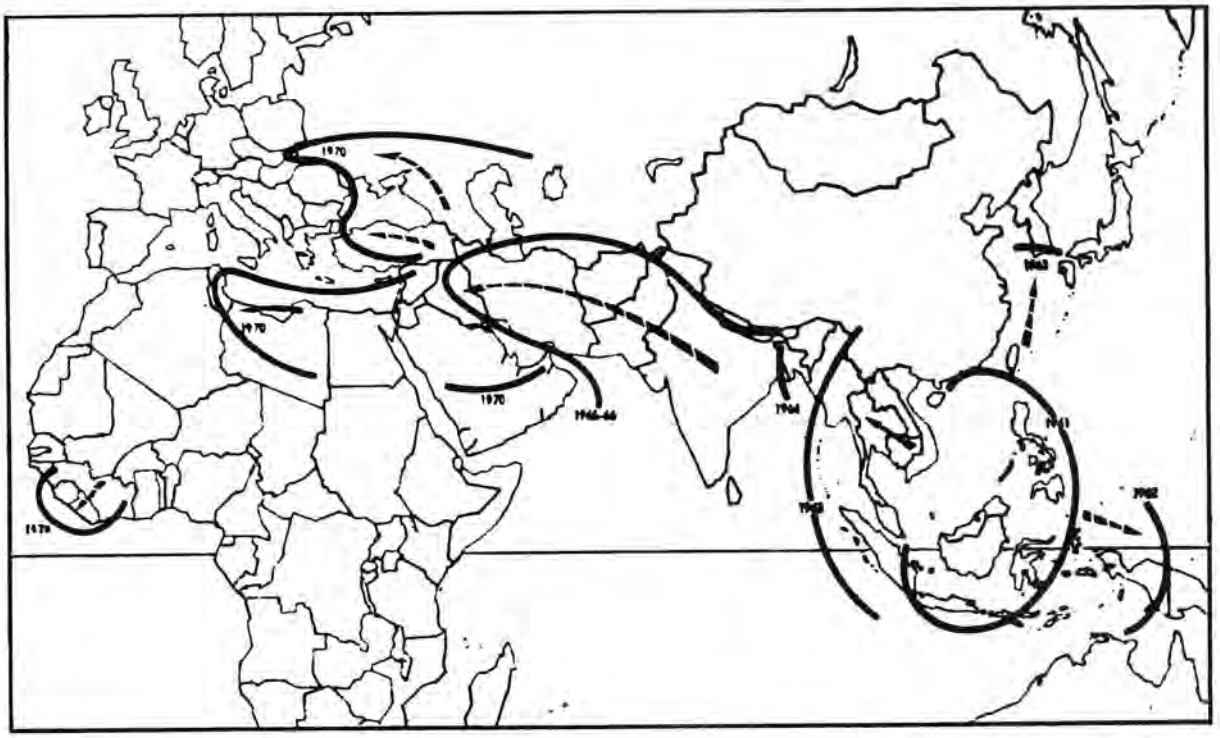
TABLE I

Cholera within the states of Malaysia from 1900 to 1970

Period	Cases	Deaths	Death rate per 100 cases	States invaded and number of cases
1902 to 1907	133	97	73	Selangor 41; Pahang 39; Perak 53.
1902* (June)	?	>1500	?	Sarawak
1910 to 1915	1685	1114	60	Selangor 237; Pahang 280; Perak 1121; N. Sembilan 1; Trengganu 46.
1918 to 1920	186	149	80	Selangor 1; Pahang 1; Perak 184.
1924 to 1927	132	85	64	Selangor 13; Perak 119.
1945 (June)	287	216	75	Perlis
1946 (June)	221	182	82	Kelantan & Trengganu
1961 (July)	301	70	23	Sarawak
	7	0	0	Sabah
1962 Nov./Dec.	16	3	18	Sarawak
1962 (Jan.-March)	35	11	30	Sabah
1963 (May)	205	14	7	Malacca — the first known *El Tor* cholera on the mainland of Malaya; Selangor; Perak; Kedah; Perlis; Johore; Negri Sembilan.
1963 Jan. & July	98	7	7	Sarawak
1964 (May/June)	513	33	10	Kedah; Perlis; Kelantan; Trengganu; Pahang; Malacca; Perak & Johore.
1964 May	198	33	16	Sarawak
1964 June	5	1	20	Sabah
1965 November	1	0	0	Selangor
1968 May/June/July	15	0	0	Kedah; Penang & P.W., Perak; Selangor; Johore.
	15	1	7	Sarawak
1969 (May)	70	5	7	Penang & P.W., Kelantan; Trengganu.
1970 May/June	27	1	3	Penang & P.W.

* Previous to the 1902 outbreak there was an epidemic in 1888, but apparently this was not severe.

FIG. 1: EXTENSION OF CHOLERA 1961 — 70



Taken from "Public Health Papers No. 40 — Principles and Practice of Cholera Control", World Health Organisation, Geneva.

by De Moor in Macassar were identified by Van Loghem as haemolytic *Vibrio cholerae El Tor* (De Moor 1939 and Van Loghem 1939).

Cholera in Malaysia during 1900-1970 is summarised in Table I. From 1900 to 1927, a total of 2,644 cases, with 1,833 deaths, were recorded Cholera invaded the states of Selangor, Perak and Pahang during 1902-1907, 1910-1915, 1918-1920 and 1924-1927. In certain years, notably 1910, 1911, 1914, 1918 and 1927, the incidence assumed epidemic proportions. Negri Sembilan, possibly for reasons of its geographical situation, appeared to have remained relatively free from cholera.

In 1945, there was an epidemic of cholera in the northern state of Perlis. The mortality was rather high, 216 deaths out of the 287 cases. In the following year in 1946, there was an outbreak in the states of Kelantan and Trengganu. Again the mortality was high. There were 182 deaths out of 221 cases.

Up to 1946, all the cholera outbreaks were entirely due to the classical *Vibrio cholerae*. However *Vibrio cholerae* biotype *El Tor* had been occasionally isolated from sporadic cases of diarrhoea in Malaysia. From 1947 to 1960, Malaysia was free from cholera. The next outbreak was in 1961 (East Malaysia — Sabah and Sarawak) and the subsequent outbreaks in 1963 (West Malaysia and Sarawak), 1964 (West Malaysia, Sabah and Sarawak), 1965 (West Malaysia and Sarawak), 1968 (West Malaysia) 1969 (West Malaysia) and 1970 (West Malaysia) were all due to *Vibrio cholerae* biotype *El Tor*. This spread to Malaysia was a part of the path of the extension of the current *El Tor* cholera pandemic which started in Sulawesi in 1961. The subsequent extension of pandemic (1961-1970) is shown in Fig. 1 by Barua and Cvjetanovic (1970). It shows the spread of cholera since 1961 to at least 40 territories. Before 1961, cholera was reported annually from only 3-6 territories. Some of these countries, including Malaysia, have had recurrences after remaining free of cholera for some years, and in several countries the *El Tor* cholera has truly become endemic.

El Tor Cholera in Malaysia (1961-1670)

Sarawak Epidemic (1961-1965)

This outbreak in 1961 is well documented in a Government report published in 1963. In July 1961, a number of deaths were reported in a kampong across the river opposite Kuching town. On investigation, several other cases of what appeared to be severe dysentery were found and one of the patients was persuaded to enter hospital for laboratory investigations. The laboratory investigation confirmed cholera. By the fourth day, the number of cases had risen to 62 and from thence on the epidemic spread rapidly as is indicated by the number of cases and deaths shown below:

Date	Number of total cases to-date	Number of total deaths to-date
15th July (4th day)	62	—
18th July (7th day)	117	22
22nd July (11th day)	195	34
29th July (18th day)	248	49
12th August (32nd day)	252	49
30th September (81st day)	293	69
19th October (100th day)	301	70

It is interesting to record that:

(i) of the 301 cases, 113 were confirmed positive bacteriologically for cholera, and

(ii) the laboratory investigations also confirmed that during the cholera outbreak in Sarawak, there was also a concurrent outbreak of bacillary and amoebic dysentery. From July to October 1971, the laboratory reported the following isolations:

V. cholerae biotype *El Tor*	113
E. histolytica	46
Sh. flexneri	82
Sh. sonnei	17

The epidemic in Sarawak continued through to 1965 as shown in Table II.

Sabah Epidemic (1961-1964)

In 1961, there were 7 cases of cholera, in 1962 there were 35 cases with 11 deaths and in 1964 there were 5 cases with 1 death.

TABLE II

El Tor Cholera Epidemic in Sarawak (1961-1970)

Year	Number of cases	Number of deaths
1961	301	70
1962	16	3
1963	98	7
1964	198	33
1965	15	1
1966-70	—	—

El Tor Cholera Epidemic in Sabah (1961-1965)

1961	7	0
1962	35	11
1963	—	—
1964	5	1
1965-70	—	—

Cholera Epidemic in West Malaysia (1963-1970)

Malacca Outbreak (1963)

It is speculated that the infection was conveyed to Malacca by the sea routes from West New Guinea through Java and Sumatra. The occurrence of cholera was recognised in Sumatra in 1962 and it is conceivable that the organism may have crossed the narrow Straits of Malacca by the many small sailing crafts that ply daily between Malacca and the Sumatra coast without medical inspection of the crew.

The epidemic in Malacca appeared in May, towards the close of a severe drought. Due to the failure of the northeast monsoon (which is normally expected between October and February) the wells dried up (some for the first time in living memory) and the level of the Malacca River, which is the main source of Malacca's water supply, fell to an unprecedented low level. Under the circumstances of extreme drought, the influence of the high tides which is normally restricted to the lower reaches of the Malacca River extended far upstream and the brackish sea water was carried upstream beyond the uptake point of Malacca's water supply. Furthermore, the brackish river was also being heavily polluted by:

(1) the effluents of the septic tanks of the General Hospital, which discharge into the river,

(2) the washing of sanitary buckets in the river, and

(3) the sewage from the numerous river-side kampong latrines.

Thus, it would appear that contaminated water was passing into the water filtration plant during and also weeks preceding the epidemic. Further during this critical period, there were also indications that chlorination had failed for several hours during the critical period in the early stages of the epidemic.

During the early stages of the epidemic, the cases were distributed mainly within the Malacca municipal area and within the Bukit Sebukor water supply. Later foci of infection appeared in widely scattered parts of the state, indicating that the later peripheral spread was mainly due to the movements of cases or carriers who also carried the disease into the states of Johore, Negri Sembilan and Perak. The outbreak continued into 1964 and spread to Selangor, Kedah, Perlis, Kelantan, Trengganu and Pahang. Meanwhile the outbreak, which started in Sabah and Sarawak in 1961, continued. Thus by 1964, the Cholera *El Tor* epidemic was truly pan-Malaysian.

In West Malaysia, the *El Tor* epidemic has continued to smoulder with sporadic cases in Perlis, Kedah, Penang, Perak, Selangor and Johore in 1968, and outbreaks in Kelantan in 1969 and in Penang and Province Wellesley in 1970.

The Mode of Entry of Cholera in Malaysia

The infection in 1910 and 1911 was believed to have been introduced into Selangor and Perak from India, and in Pahang and Trengganu from Siam. On occasions, the origin of the disease has been obscure and has tentatively been ascribed to carriers and illegal immigrants. In 1907, an outbreak involving 12 cases with 11 deaths at Kuala Selangor was ascribed to clothing of a labourer newly arrived from India. Watson (1927) reported that in 1910, some cases of cholera had arisen from clothing "inherited" from those who had recently died from cholera.

Entry into Malacca during the 1963 outbreak

Throughout 1961, sporadic infections with the *Vibrio cholerae* biotype *El Tor* was reported from the Celebes. The spread of the epidemic from 1961 to 1963 from the Celebes has been summarised in the report on the "Outbreak of Cholera in Malacca 1963" (1964) and this is shown in Table III.

According to Felsenfeld (1963), the spread to

TABLE III

El Tor Cholera in South-East Asia & Western Pacific May 1961 — May 1963

Country	Cases	Deaths	Percentage Mortality	Period	Origin
Celebes	109	29	27	1961	Primary centre
Indonesia	4017	897	22	May 1961 Feb. 1963	Secondary centre Jakarta
Sarawak	582	79	17	July 1961	Macassar
Macau	13	6	46	August 1961	Kwangtung ?
Hongkong	76	15	20	August 1961	Macau ?
Philippines	18556	2323	13	Sept. 1961 April 1962	Macau ? Secondary centre Manila
West New Guinea	1428	498	35	Sept. 1962 March 1963	?
Malacca*	205(128)	14(9)	7	May 1963	?

* (Figures in brackets are bacteriologically confirmed cases)

TABLE IV

Distribution of cholera (1961-1970) by ethnic group

Year of epidemic	Ethnic group			
	Malays	Chinese	Indians	Others
1961 — Sarawak	160	16	—	67 (Dyaks)
1964 — Trengganu	181	4	—	—
Kelantan	36	—	—	—
Pahang	36	2	—	—
1969 — Kelantan	65	1	2	—
1970 — Penang & Province Wellesley	—	27	1	—

Sarawak seems to have come directly from the endemic centre in Macassar and from the Philippines, the disease moved southwards through the islands and was introduced into North Borneo by a visitor from Jolo Island. The exact mode of entry in Malacca is not known, but the presumption is that the *El Tor* vibrio was brought in by sea from some undisclosed source. The seaways between New Guinea, Java and Sumatra are open, and there is evidence of trade between Malacca and Sumatra which is only 30 miles away.

Epidemiology

Cholera commonly occurs after the dry spell in May, June and July when the rainfall is lowest. The annual average rainfall in West Malaysia is 94-96 inches on the west coast and 118 inches on the east coast.

Cholera is a water-borne disease which flourishes in areas of poor water supply and sewage disposal, bad environmental sanitation, poor socio-economic conditions, poverty, ignorance and bad personal hygiene. Hence in Malaysia as in other countries, cholera is more common in rural (kampongs and rubber estates) and suburban areas. The Table IV shows distribution of cholera (1961-70) in Malaysia by ethnic group and this bears testimony to the regional distribution of the population in Malaysia and does not indicate that Malays are more susceptible to cholera than the other ethnic groups.

Distribution of cases by sex is shown in Table V. Slightly more males are affected than females.

Age distribution is shown in Table VI. All ages are susceptible but the disease occurs more commonly amongst the active outdoor working adults of either sex and aged between 21-50 years.

TABLE V

Distribution of cholera (1961 and 1969) by sexes

Year	Male	Female
1961 — Sarawak	143	100
1969 — Kelantan	29	39
	172	139

Carriers play a significant role in the transmission of the disease. Tull (1928) found 2 per cent carriers amongst 700 inoculated persons exposed to cholera

TABLE VI

Distribution of cholera cases by age

Year of epidemic	Age range in years					
	0-10	11-20	21-30	31-40	41-50	50+
1961 — Sarawak	21	18	50	65	38	51
1969 — Kelantan	11	10	14	15	10	8
	32	28	64	80	48	59

infections on a quarantined ship in Singapore. The vibrios were excreted in the stools of the carriers for periods of 6 to 32 days. On the other hand (IMR Annual Report 1920), 866 labourers on a rubber estate where cholera had occurred were examined and no carrier was found.

In 1969, during the outbreak of cholera in Kelantan, 125 carriers were detected as compared to 68 cases, ie. ratio 2 carriers to every 1 case.

Mortality

Deaths are more common amongst the young, the aged, the undernourished and debilitated persons. The death rate per 100 cases during the cholera epidemics in Malaysia between the years 1900-1970 is shown in Table I. From the table, it is clear that the mortality during early epidemics (1900-1946) was extremely high when the death rate ranged from 60-82 per cent. However, during the recent outbreaks (1961-1970) the death rate was significantly low. It ranged from 0-30 per cent in East Malaysia and 0-10 per cent in West Malaysia. All the outbreaks of cholera between 1900-1946 were due to classical *Vibrio cholerae* whereas those during 1961-1970 were due to *Vibrio cholerae* biotype *El Tor*. The observed drop in mortality is perhaps chiefly due to the effective modern therapeutic methods and facilities that are available today, rather than to the differences in virulences of *Vibrio cholerae* (classical) and *Vibrio cholerae* biotype *El Tor*.

Table VII shows that the outbreaks in 1961, 1962, 1963 and 1964 were due to the *Ogawa* serotype. However, in 1964 towards the tail-end of the outbreak, some 20 strains belonging to the *Inaba* sertoype were isolated. All outbreaks thereafter in 1968, 1969 and 1970 were due to the

TABLE VII

Sero-types of Vibrio cholerae biotype El Tor strains examined at the Division of Bacteriology, Institute for Medical Research, Kuala Lumpur.

Year	Source & number of strains examined		Indentification		
			Biotype	Serotype Ogawa	Inaba
1961	Sarawak — 3		*Vibrio cholerae* biotype *El Tor*	+	—
1963	Malacca — Malacca 13 cases Selangor 1 case Muar 3 cases	17	,,	17	—
1964	Perlis, Kedah, Kelantan, Trengganu, Pahang — 525 (2 from water) Sabah — 3	528	,,	508	20*
1965	Selangor — 1		,,	1	—
	Brunei — 9			9	—
1968	Kedah 9 cases (4 from carriers) Penang 3 cases Perak 1 case Selangor 7 (4 from carriers) Johore 2 cases	22	,,	—	20
1969	Kelantan 80 (44 from carriers)		,,	—	80
1970	Penang & P. Wellesley — 28		,,	—	28

* These strains were isolated towards the tail end of the outbreak.

TABLE VIII

Phage types of Vibrio cholerae biotype El Tor isolated from 1964-1969

Year	Source of Strains	Distribution by phage type								
		1	2	3	4	5	6	7	Untype-able	Total
1964	Perlis, Kedah, Kelantan, Trengganu & Pahang	2	—	6	23	—	18	8	2	59
1965	Selangor	—	—	—	—	—	—	1	—	1
	Brunei	1	—	—	—	—	8	—	—	9
1969	Kelantan	—	28	—	4	—	—	—	—	32
		3	28	6	27	—	26	9	2	101

Inaba serotype. The change from *Ogawa* to *Inaba* serotypes does not appear to be associated with any significant changes in mortality and morbidity.

Vibro cholerae phage types occurring in Malaysia

Table VIII shows phage types of representative strains of *Vibrio cholerae* biotype *El Tor* isolated between 1962-1964. The strains were phage typed through the courtesy of Dr. S. Mukerjee, WHO International Reference Centre for Vibrio, Calcutta. Some 101 strains have been phaged. Only 2 strains were untypable and the remaining strains belonged to 6 of the 7 recognised phage types. No strain belonging to phage type 5 was encountered. The phage types of *Vibrio cholerae* biotype *El Tor,* like the serological types, have been of little or no value in the study of the epidemiology of the disease.

Prevention and Control

It is well known that contaminated water is the important vehicle for the rapid spread of cholera epidemics, while insanitary personal and food habits of the population are largely responsible for the persistence and intensification of transmission of the epidemics. Thus the first preoccupation of health authorities to control cholera is the preservation of the quality of water supplied. This is achieved in Malaysia through constant vigilance and stepping up the chlorine content in the water supplied and chlorination of wells. Human faeces is the main source of infection and it is also well known that cholera outbreaks are associated with situations in which the water supply is exposed to a high risk of contamination with human faeces due to insanitary defecation habits of the people or when the methods of excreta disposal favour, rather than control, the spread of contamination. In Malaysia, water supply and sewage disposal systems in most urban areas are good, adequate and safe but in the rural and suburban areas (especially before independence) they are still inadequate and there is much room for improvement.

Since independence, through the implementation of successive Government development plans which have given high priority to rural development and education, some modern amenities have become available to rural people and their socio-economic position is somewhat better today, but much still remains to be done so as to bridge the gap in the standard of living between rural and urban populations.

Since independence, the medical and health services are being extended to rural areas, and the development of a National Health Laboratory Service is being given priority. This should ensure more effective and thorough implementation of surveillance programmes. However, all said and done it is realised that it may not be possible to keep cholera out of Malaysia but it is hoped to keep the disease under control by limiting its spread. Nevertheless, we in Malaysia are optimistic that through the continued improvement of the socio-enocomic position of the masses and the health services in Malaysia, it will not be long before Malaysia is rid of not only of cholera but also other water-borne parasitic diseases, insect-borne

diseases, communicable diseases, diseases due to poor sanitation and other environmental diseases like malnutrition and deficiency diseases.

Summary

From time immemorial, cholera has been brought into Malaysia from the neighbouring countries where cholera has been and still is endemic and epidemics of the disease have taken their toll in human lives.

Records (earliest date back to 1828-30) show that Malaysia has been invaded by seven successive cholera pandemics* since the first pandemic in 1817. During the first pandemic, cholera reached Malaysia in May 1829, i.e. two years after the epidemic had ravaged India. The details pertaining to the cholera epidemics in Malaysia from 1900-1970 are shown in Table I. Between 1900-1946, six epidemic outbreaks of cholera were recorded in West Malaysia and one in Sarawak. All these outbreaks were due to the classical *Vibrio cholerae*. From 1946 to 1961, Malaysia was free from cholera. In 1961, the present *El Tor* cholera pandemic invaded East Malaysia and in 1963, it reached West Malaysia. The disease has spread to all the states in Malaysia and has continued to smoulder with recurrences in 1962 (Sabah and Sarawak), 1963 (Malacca, Selangor, Johore, Perak and Sarawak), 1964 (Kedah, Perlis, Trengganu, Kelantan, Pahang, Perak, Johore, Sabah and Sarawak), 1968 (Kedah, Penang, Perak, Selangor, Johore and Sarawak), 1969 (Penang, Kelantan and Trengganu) and 1970 (Penang and Province Wellesley).

In 1965, there was one single isolated case and in 1966 and 1967, there were no cases.

The outbreaks (1961-70) were due to *Vibrio cholerae* biotype *El Tor*. The strains isolated and examined at the Institute for Medical Research, Kuala Lumpur from 1961-1965 were serotyped as *Ogawa*. However in 1964, of the 528 strains examined, 20 isolated towards the tail-end of the outbreak, were serotyped as *Inaba*. From 1968-1970, all the strains isolated and examined were serotyped as *Inaba*.

Records show that though Malaysia has often been invaded by cholera in the past, and the disease has spread and assumed epidemic proportions, the disease has never truly become endemic here. The records also show that cholera outbreaks usually start during the dry spell in May, June and July and that the outbreaks terminate with the onset of the rainy season.

Cholera is a disease of ignorance, poverty, insanitary water supply and sewage disposal, bad personal hygiene and environmental sanitation. Under these circumstances, in Malaysia like other countries, it is little wonder that the disease is more prevalent amongst the people living in the rural and suburban areas. It commonly affects adults, aged 20-40 years who are engaged in outdoor work, and hence in Malaysia more males are affected than females.

The mortality rate, which ranged from 60-80 per cent in the outbreaks between 1900-1946, came down to 0-30 per cent in 1961-1970. This is partly due to better medical facilities and treatment available these days and partly perhaps to the fact that *Vibrio cholerae* biotype *El Tor* is less virulent than the classical *Vibrio cholerae*.

To date, some 101 strains of *Vibrio cholerae* biotype *El Tor* isolated in 1964, 1965 and 1969 in West Malaysia and Brunei have been phage typed. This has been made possible through the courtesy of Dr. S. Mukerjee. The strains were grouped into 6 of the 7 recognized phage types, namely 1, 2, 3, 4, 6 and 7. No strain belonging to phage type 5 has been recognised in Malaysia. Only two strains were untypable. The *Vibrio cholerae* biotype *El Tor* phage types like the serological types of strains examined, have been found to vary in different outbreaks and also within the same outbreak and hence have been of scarcely any use in the study of the epidemiology of the disease.

Finally a word on the future of cholera in Malaysia. We are optimistic that through the continued improvement of the socio-economic position of the masses and the medical and health services especially in the rural areas, before long Malaysia will be rid not only of cholera but also of a host of other water-borne and insect-borne diseases, communicable diseases, and diseases due to poor sanitation and other environmental diseases like malnutrition and deficiency diseases.

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* Pollitzer (1959)

First pandemic	1817 — 1823	6 years	
Second "	1826 — 1837	11 "	
Third "	1846 — 1862	16 "	
Third "	1864 — 1875	11 "	
Fifth "	1883 — 1896	13 "	
Sixth "	1899 — 1923	24 "	
Seventh "	1961 — to date	10 "	

Bibliography

Barua, D. and Cvjetanovic, B. 1970. "Public Health Papers No. 40 — Principles and Practice of Cholera Control" World Health Organisation, Geneva, p. 17-21.

Clifford, H. 1913. Malayan Monochromes, p. 33. London, John Murray.

De Moor, C.E. 1939. *Trop. Dis. Bull. 36:* 374.

Felsenfeld, O. 1963. *Bull. Wld. Hlth. Org. 28:* 289-296.

Green, R. 1951. IMR Studies No. 25. The Institute for Medical Research, Kuala Lumpur, p. 237-243.

Innes, E. 1885. The Chersonese with the Gilding Off. p. 148, London, Richard Bentley.

Institute for Medical Research, Kuala Lumpur, 1915, Annual Report for 1914, p. 53.

Institute for Medical Research, Kuala Lumpur, 1920, Annual Report for 1919, p. 3.

Institute for Medical Research, Kuala Lumpur, 1925, Annual Report for 1924, p. 6.

Institute for Medical Research, Kuala Lumpur, 1928, Annual Report for 1927, p. 16.

Institute for Medical Research, Kuala Lumpur, 1928, Annual Report for 1937, p. 19.

Institute for Medical Research, Kuala Lumpur, 1961, Annual Report, p. 27.

Institute for Medical Research, Kuala Lumpur, 1963, Annual Report, p. 14.

Institute for Medical Research, Kuala Lumpur, 1964, Annual Report, p. 11.

Institute for Medical Research, Kuala Lumpur, 1965, Annual Report, p. 12.

Institute for Medical Research, Kuala Lumpur, 1968, Annual Report, p. 36.

Institute for Medical Research, Kuala Lumpur, 1969. Annual Report, p. 22.

Institute for Medical Research, Kuala Lumpur, 1970, Annual Report (In press).

Medical and Health Dept., Sarawak. 1961 Annual Report.

Medical and Health Dept., Sarawak. 1962 Annual Report.

Medical and Health Dept., Johore. 1963 Annual Report.

Medical and Health Dept., Sarawak. 1963 Annual Report.

Medical and Health Dept., Johore. 1964 Annual Report.

Medical and Health Dept., Kedah. 1964 Annual Report.

Medical and Health Dept., Sarawak. 1964 Annual Report.

Medical and Health Dept., Trengganu. 1964 Annual Report.

Medical and Health Dept., Sarawak. 1965 Annual Report.

Medical and Health Dept., Kedah. 1968 Annual Report.

Medical and Health Dept., Kelantan. 1968 Annual Report.

Medical and Health Dept., Penang. 1968 Annual Report.

Medical Dept., North Borneo. 1961 Annual Report.

Medical Dept., Sabah, Malaysia. 1962 Annual Report.

Medical Dept., Malacca. 1963 Annual Report.

Medical Dept., Perak. 1963 Annual Report.

Medical Dept., State of Sabah, Malaysia. 1963-64 Annual Report.

Medical Dept., Selangor. 1968 Annual Report.

Medical Health and Dental Dept., Perlis. 1964 Annual Report.

Medical Services, Malayan Union. 1946 Report of the Medical Dept. Govt. Printer, Kuala Lumpur.

Pollitzer, R. 1959. CHOLERA, *Monograph Series No. 43. Wld. Hlth. Org.*, Geneva.

"Report on Cholera Outbreak in Sarawak 1961". 1963. Govt. Printing Office, Kuching.

"Report on the Outbreak of Cholera in Malacca 1963" by The Committee of Enquiry Appointed by the Cabinet, 1964. Govt. Printing Department, Kuala Lumpur, p. 6.

Rodger, J.P. 1896. Administrative Report for Selangor 1895, p. 2. Kuala Lumpur Govt. Printing Office.

Sandosham, A.A. 1964. *Med. J. Malaya, 18,* 4, 276-280.

Talib, A. 1970. "Report on the Outbreak of Cholera in Kelantan 1969" Mimeograph Report.

Tull, J.C. 1928. *Malay. Med. J. 3:* 106.

Van Loghem, J.J. 1939. *Trop. Dis. Bull. 36:* 374.

Ward, J.M. and Grant, J.P. 1830. Medical Statistics and Topography of Malacca and Prince of Wales, p. 28, Penang Govt. Press (Raffles Museum).

Watson, M. 1927. *Malay. Med. J. 2:* 122.

Ante-partum localisation of the placenta with radioactive isotope Indium (^{113m}IN)

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PLACENTOGRAPHY FOR THE ANTE-PARTUM localisation of the placenta has been in use for about 20 years, ever since the radioactive isotope of sodium (^{24}Na) was available. Ante-partum placental localisation is presently undertaken more frequently not only for the confirmation of placenta praevia, but also as a pre-amniocentesis prerequisite. Placental localisation, in the management of clinical cases of ante-partum haemorrhage, is of tremendous benefit to both the hospital and the patient; for the exclusion of placenta praevia in these cases allows the expectant mothers, who are in hospital, to return home for social reasons or to free the acute hospital beds for other ante-natal cases. The inadequacy of ante-natal beds for expectant mothers is universal, but such deficiency is more marked in underdeveloped and developing countries of the world, in reference to which Malaysia and Singapore are no exception. If reliance is to be placed on the method of placental localisation, then it must not only be accurate, but also convenient and without undue risk to mother and foetus.

Materials and Method

All isotopic methods of ante-partum placental localisation depend upon the labelling of the maternal blood, and the subsequent detecting of the maternal blood pool in the placental "bed", i.e. in the chorio-decidual space and the decidua basalis area of the gravid uterus. Previously, various other radioactive isotopes, such as sodium ^{24}Na (Browne, 1951), iodine ^{131}I as iodinated serum albumin (Hibbard, 1969), and technetium ^{99m}Tc as technetium serum albumin (Walker et al., 1968, James et al., 1971) have been used. However, based upon the short half-life of the isotopes, the radiation dose (to both the mother and foetus) per useful photon, the quality of the isotopic scans obtained, and the availability of the radioisotopes, it is now felt that the radioisotope Indium ^{113m}In is the best for placental localisation studies (Buttfield et al., 1971).

Indium — 113m (^{113m}In), which is a radioactive isotope of indium, is derived by elution with

N/20 HCl from a 113Sn — 113mIn generator column. The radioactive isotope of indium (113mIn) has a very short physical half-life of 1.7 hours, in contrast to the physical half-lifes of 115 days for tin (113Sn), 8 days for radioactive iodine (131I), and 6 hours for technetium (99mTc). In addition, indium (113mIn) has a biologic half-life of 3 hours, and the effective half-life is only 1 hour. The radiation dose to the foetus from 1 mCi of 113mIn — Transferrin has been calculated as 36 mR* (total body) at 1 cm. from the placenta and 3 mR (total body) at 3 cm. from the placenta. The radiation dose to foetal blood is estimated to be 8 mR. This value is less than the calculated radiation dose to the foetus-in-utero from a plain X-Ray of the abdomen, and compares very favourably with the calculated radiation dose to the foetus of 100mR per X-ray abdomen or 1,000 mR for X-ray pelvimetry studies. The total maternal radiation dose from 1 mCi 113mIn is calculated to be 17 mR (Van de Mereve et al., 1970). Hence, the dosage of radioactive indium 113mIn used for a single placental scan is extremely small, and resultant radioactivity hazard to the mother and foetus is negligible.

The isotope 113mIn, in a HCl medium with a pH of about 1.6, is pre-mixed with maternal blood, and a dose of 0.5 to 1 mCi is injected via the ante-cubital vein into the maternal circulation. The isotope becomes readily bound to the plasma transferrin (B-globulin) molecule, as an indium-transferrin complex. This indium-transferrin complex does not appear to cross the placental membrane into the foetal circulation to any extent (Johnson et al., 1969).

Prior to the injection, the patient is instructed to empty her bladder completely. After the injection, with the patient in the supine position, the "uterine" area of the abdomen is outlined and carefully scanned to localise accurately the site of maximal pooling of the maternal blood at the site of the placental bed by measuring the site of maximal radioactivity. This would indicate the site of placental implantation. Photo-scan records showing the sites of placental localisation are made. In those cases, where the placental site is not fundal in position or is poorly seen, further scan studies are made with patient in the lateral position.

Results

This study is a joint project undertaken by the Departments of Obstetrics and Gynaecology and Pathology of the University of Malaya Medical Centre. It was started in August 1970 and is still in progress. In this paper is presented the analysis of the first 20 consecutive placental scans of the patients that had been followed to their delivery, during the first 8 months of the study period from August 1970 to March 1971 inclusive.

Figures 1 to 6 show examples of the various sites of placental localisation in the scans. The results of the first 20 placental scans are summarised in Tables I to IX. The accuracy of placental localisation is shown in Table X.

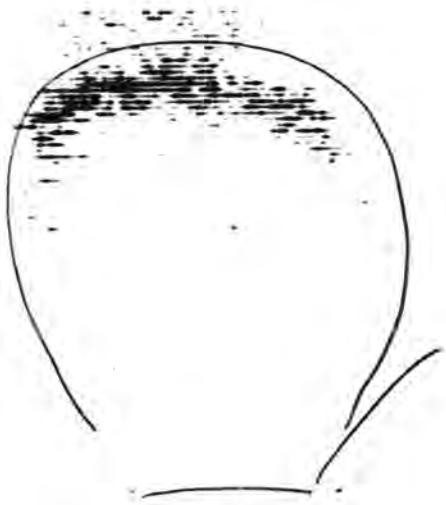

Fig. 1: Antero-posterior (A-P) view showing the placenta in the fundus of the uterus.

Fig. 2: A-P and left lateral view showing placenta in the upper uterine segment on the left side.

*mR = Mille Rads.

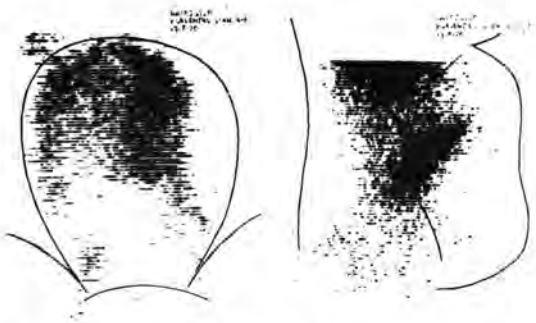

Fig. 3: A-P and right lateral view showing placenta in upper uterine segment and posterior wall.

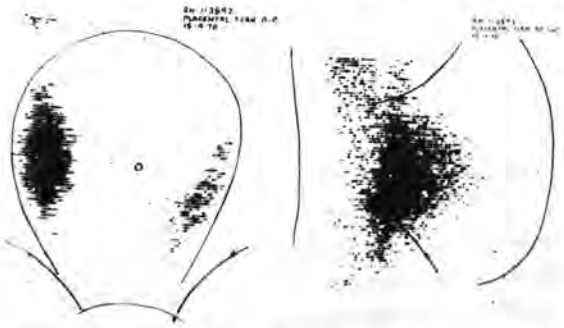

Fig. 4: A-P and right lateral view. The lower edge of the placenta dips down into the lower uterine segment — placenta praevia, type I.

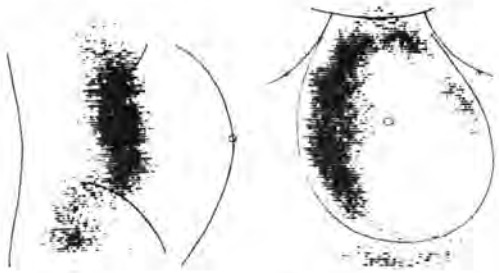

Fig. 5: A-P and left lateral view showing placenta partially covering the lower uterine segment — placenta praevia, type III.

TABLE I

ETHNIC PATTERN

	No. of Cases	Per cent
Chinese	12	60
Indian/Ceylonese	6	30
Malay	2	10

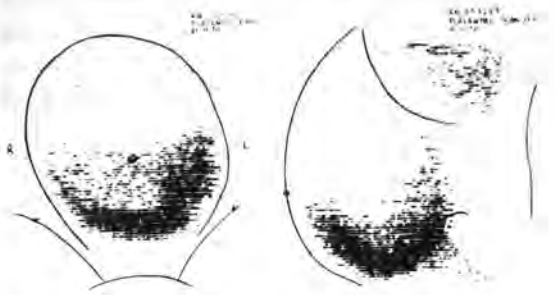

Fig. 6: A-P and left lateral view showing placenta completely covering the cervical os — placenta praevia, type IV.

TABLE II

MATERNAL AGE PATTERN

	No. of Cases	Per cent
Under 20 years	1	5
20 to 29 years	13	65
30 to 39 years	5	25
40 years and over	1	5

TABLE III

MATERNAL GRAVIDA PATTERN

	No. of Cases	Per cent
Primigravida	9	45
Gravida 2 to 4	7	35
Gravida 5 to 10	4	20

TABLE IV

CLINICAL PRESENTATION PATTERN

	No. of Cases	Per cent
Ante-partum Haemorrhage	10	50
Unstable Lie	6	30
High Presenting Part at Term	2	10
Pre-Amniocentesis Scanning	2	10

TABLE V

GESTATIONAL MATURITY AT SCANNING

	No. of Cases	Per cent
30 to 34 weeks	6	30
35 to 36 weeks	8	40
37 to 38 weeks	3	15
39 to 40 weeks	2	10
Over 40 weeks (41 weeks)	1	5

TABLE VI

PLACENTAL LOCALISATION ON SCAN

	No. of Cases	Per cent
In upper Uterine Segment (Fundus or Body)	14	70
Placenta Praevia (Minor Degree)	2	10
Placenta Praevia (Major Degree)	4	20

TABLE VII

MODE OF DELIVERY PATTERN

	No. of Cases	Per cent
S.V.D.	12	60
Forceps/Ventouse	2	10
Breech	1	5
L.S.C.S.	5	25

TABLE VIII

FOETAL MATURITY AT DELIVERY

	No. of Cases	Per cent
Under 35 weeks	1	5
35 to 36 weeks	2	10
37 to 38 weeks	7	35
39 to 40 weeks	6	30
Over 40 weeks	4	20

TABLE IX

CORRELATION OF CLINICAL PRESENTATION WITH SCAN FINDINGS

Clinical Presentation	U.U.S.	L.U.S.	No. of Patients	Per cent
Antepartum Haemorrhage	7	3	10	50
Unstable Lie	4	2	6	30
High Presenting Part at Term	1	1	2	10
Pre-Amniocentesis Scanning	2	0	2	10

TABLE X

ACCURACY OF PLACENTAL LOCALISATION IN STUDY

Site of Localisation	Initial Scan Localisation of Placenta	Final Clinical Localisation of Placenta
IN UPPER UTERINE SEGMENT (Fundus or Body)	15 cases	(14 cases In Upper Segment (1 case Placenta Praevia (Minor degree)

Inaccuracy Rate in Localising Minor Degree of Placenta Praevia of 6.7%

IN LOWER UTERINE SEGMENT (PLACENTA PRAEVIA):	5 Cases	5 Cases
Minor Degree of Placenta Praevia	2 Cases	2 Cases
Major Degree of Placenta Praevia	3 Cases	3 Cases

Inaccuracy Rate of Localisation — Nil

OVERALL INACCURACY RATE OF PLACENTAL LOCALISATION IN STUDY IS 5%

Summary and Conclusions

1. A study of the antepartum localisation of the placenta by the use of radioactive isotope Indium 113mIn scanning of the uterine area of the abdomen, as undertaken in the University of Malaya Medical Centre, is presented.
2. The major advantages of the method of placental localisation, as compared to all previous methods, are the very high degree of accuracy, feasability of localisation at an early period of gestation, ease of technique, ease of interpretation of results, and negligible hazard to the foetus and mother.
3. The accuracy of localisation is almost 100%.

References

Browne, J.C.M. (1951). *Proc. Roy. Soc. Med.* 44: 715.

Buttfield, I.H. and Biggs, J.S.G. (1971). *Aust. N.Z.J. Obstet. Gynec.* 11: 72.

Hibbard, B.M. (1969). *Brit. Med. J.* 3: 85.

James, A.E., Strauss, H.W., Fischer, K. et al. (1971). *Obstet. et Gynec.* 37: 602.

Johnson, P.M., Chao, S. and Goodwin, P.N. (1969). *Radioloy* 92: 625.

Van de Mereve, E.J., Lotter, M.D. and Van Heardon, P.D.R. (1970). *J. Nucl. Med.* 11: 31.

Walker, R.H.S. and Kohorn, E.I. (1968). *J. Obstet. Gynaec. Brit. Cwlth.* 75: 464.

Human infection with rat lungworm Angiostrongylus cantonensis (Chen, 1935) in West Malaysia

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EOSINOPHILIC MENINGOENCEPHALITIS due to *A. cantonensis* is the result of invasion of the central nervous system in man by the developmental stages of the nematode. The condition has not previously been reported from West Malaysia (Malaya). Watts (1969) reported five cases of eosinophilic meningitis from Sarawak, East Malaysia and suggested the rat lungworm *A. cantonensis* as the cause.

Although suspected by physicians aware of the condition, eosinophilic meningoencephalitis has not so far been reported in West Malaysia. The following case is the first in which eosinophilic meningoencephalitis due to *A. cantonensis* in West Malaysia has been found in man.

Case Report

A 27-year-old Chinese male, a sales representative from Kuala Lumpur, was admitted to hospital on the 7th June, 1971, with a 12-day history of severe headache, fever, backache, generalised muscle pains, weakness of legs (severe enough to prevent walking or standing even for micturition for any length of time) and disturbance of vision. He was seen at one hospital six days earlier and given analgesics for his headache and body pains and discharged after three days without a diagnosis having been made.

On the 22nd May, the patient had a meal of prawns and other shellfish which were lightly scalded together with raw lettuce, tomatoes and other salad greens. Two days later, he developed stomach cramps with pain in the right hypochondrium. Headache and disturbance of vision developed six days later (28th May) with headache, weakness of body and pain in the lower legs. Abdominal cramps and pain in the right hypochondrium persisted.

After consulting a private practitioner, who prescribed analgesics and a sedative, the patient left Kuala Lumpur on the 29th May for Ipoh, about 140 miles away where, on the advice of relatives, he consulted a "Chinese medicine man", who prescribed a mixture of Chinese herbs. On his return to Kuala Lumpur two days later, he again consulted a private practitioner who, suspecting a "virus" condition, advised admission to hospital in view of the persistence of symptoms.

The patient when seen on the 7th June was pyrexial (99.8°F) being able to walk only with the aid of a stick. The chest was clear and he was tender in both loins. Photophobia and marked neck

Kernig's and Brudzinski's signs were positive, the knee and ankle jerks brisk, and the plantar responses were extensor suggesting meningitis. A right facial weakness was noted soon after admission.

Lumbar puncture revealed an opalescent fluid under increased pressure (300 mm. CSF). The cells in the CSF numbered 610/c.mm. (P. 44%, L.25%, E. 31% the sugar was 58 mg.%, chloride (NaCl) 680 mg.%.) Total protein was 145 mg.% with globulin positive. Two larval nematodes, each measuring 517 u long by 10.4 u wide and 713 u long by 10.4 u wide respectively, were recovered in the CSF and seen alive by one of us (J.K.L.). It was identified as the late third stage larvae of *Angiostrongylus cantonensis*. These larval worms corresponded in all respects to the larval stage of *A. cantonensis* at about the fifth post-infective day from the cerebrum of laboratory-bred white rats infected with the third stage infective larvae of the parasite, obtained from land slugs and snails from an oil-palm estate on the outskirts of Kuala Lumpur.

The haemoglobin was 16 gm.%; the ESR was 7mm/hr. The white blood cells numbered 10,200/c.mm. (P.48%, L.19%, M.3%, E.30%). No malaria parasites were found in the blood. The Widal and Weil-Felix reactions were negative. The liver function tests were within normal limits. A rise of gammaglobulins was noted a week after admission. The urine was clear. Three stool examinations by centrifugal concentration using the formalin-ether method were negative for ova or protozoan cysts.

Repeat L.P. on the third day of admission showed an opalescent fluid with a pressure of 250 mm. CSF with total cells numbering 378/c. mm. (L.42%, E.45%). Many Charcot-Leyden crystals were identified in the CSF. No TB organisms were isolated and culture and animal inoculation were negative.

The patient was treated with thiabendazole 1.2 G t.d.s. for a week with a rest for two days followed by another week of the drug at the same dosage. He gradually recovered and was discharged symptom free, two-and-a-half weeks after admission.

On subsequent follow-up about one-and-a-half weeks later (7.7.71) the patient was readmitted as he complained of fever with chills, headache, body aches and numbness of his limbs for one day. On examination, his temperature was 100°F and there was no neck stiffness. Lumbar puncture on the 9.7.71 was as follows:— pressure 170 mm. CSF, fluid slightly cloudy, red blood cells 50, white blood cells 720 (E.> 80%), sugar 67 mg.%, total protein 120 mg.%, globulin positive. His total white blood count was 8,500 (P.61%, L.28%, M.1%, E.10%). The ESR was 6mm./hr.

As his fever and very high CSF eosinophilia was regarded as a reaction to dead or dying larval *A. cantonensis*, the patient was treated symptomatically with analgesics and anti-pyretics. His symptoms cleared quite rapidly, his temperature coming down to normal the day following admission, with discharge five days after admission.

Discussion

A. cantonensis is normally a parasite of rats and has been found in rats in all the Pacific Islands and parts of Southeast Asia and the Far East from which eosinophilic meningoencephalitis has been reported. This lungworm is a common parasite of Malaysian field rats (*Rattus jalorensis* and *R. argentiventer*). Other rats (*R. bowersi, R.r. diardi, R. exulans, R. mulleri*) were also found infected (Lim et al., 1965; Lim and Heyneman, 1965).

The giant African snail *A. fulica* is very susceptible to infection with larvae of *A. cantonensis* (Alicata, 1969; Bisseru and Verghese, 1970). Many species of molluscs, both land and fresh water species, are naturally and can also be experimentally infected with this nematode (Bisseru and Perianan, 1968). Species such as *Pila scututa, Brotia costula* and *Indoplanorbis exustus* which are common in rice fields, streams and lakes in the country have been found to be eaten and are also taken orally for medicinal purposes by certain communities (Lim and Krishnansamy, 1970).

Infection in man with *A. cantonensis* has been reported from Thailand (Punyagupta, 1965; Tangchai et al., 1967), Vietnam (Jindrak and Alicata, 1965), Sumatra, Indonesia (Smit, 1962; 1963) and clinically suspected in the Philippines (Latonio, 1971).

Angiostrongyliasis in man reported from Tahiti has resulted largely from the eating of certain freshwater crustaceans (prawns) which carry the infective larvae of the parasite (Alicata and Brown, 1962). In Saipan, infective larvae of *A. cantonensis* have been found under natural conditions in land crabs and when eaten raw, these crustaceans have caused human infection (Alicata, 1964).

Strong evidence for the aetiological role of *A. cantonensis* causing eosinophilic meningoencephalitis in this case was the finding of larvae in the cerebrospinal fluid. Bisseru (1971) has shown that the same strain of *A. cantonensis* exists throughout West Malaysia and the parasite is very likely the same throughout Southeast Asia.

On epidemiological grounds the incidence of *A. cantonensis* in rats and the consumption of raw

freshwater prawns are significant in human infection, as discussed above. Heyneman and Lim (1967) found that the land slug *Microparmarion malayanus* discharged living third stage larvae on the surface of lettuce leaves which remained alive and infective in slime for as long as 72 hours. Moreover, lettuces in Kuala Lumpur markets were found to be contaminated with *A. cantonensis* larvae at the rate of 2-3 larvae per 50 grams of leaf.

The patient gave a clear history of the consumption of "raw" prawns, other shellfish, raw lettuce, tomatoes and other salad greens, and he was infected by the consumption of the raw vegetables contaminated by larvae and slugs and possibly the "raw" prawns also played a part. Thiabendazole was effective in treatment.

An eosinophilia of the cerebrospinal fluid may be due to parasitic and non-parasitic causes. Meningitis (tuberculosis and other bacteria) and encephalitis are commonly encountered in Malaysia and Southeast Asia. Migrating larvae of *Gnathostoma spinigerum* may invade the central nervous system causing an eosinophilic myelo-encephalitis with widespread paralysis, marked disturbance in consciousness and a high mortality as seen in Thailand (Punyagupta et al., 1968).

In cases of meningitis or meningoencephalitis, eosinophilia of the cerebrospinal fluid is not usually specifically sought for and in consequence, eosinophilic meningoencephalitis or mild cases of the disease can escape detection. The sporadic cases of eosinophilic meningitis at first of unknown aetiology in various Pacific islands drew attention to cerebral angiostrongyliasis in Ponape, Tahiti and New Caledonia (Rosen et al., 1961.).

The use of Leishman stain as a method of carrying out a differential count on the cerebrospinal fluid (Lucas, J.K. and Anniah, J., unpublished) is given as a step towards elucidating cerebrospinal eosinophilia when present. The method is as follows:

(1) The sample of CSF is centrifuged.

(2) Pipette almost the entire supernatant fluid, mixing the deposit with the remaining fluid in the tube.

(3) Place about 3-4 drops of the mixture on a slide and gently spread with a glass rod (or small test tube) to avoid crushing the cells.

(4) The smear is dried slowly, using warm and cold air alternatively from a hair-dryer.

(5) Four drops of Leishman's stain and four drops of distilled water are mixed in a small test tube and gently poured on to the dried smear.

(6) Spread the stain mixture over the smear by either gently tilting the slide or by gentle blowing to prevent the danger of washing away the smear.

(7) After 1 to 2 minutes (particularly, if eosinophils are to be seen clearly and after 3 minutes if all leucocytes are to be identified) rinse the stain away with distilled water using a pipette.

(8) While the smear is still wet apply cover slip; or, gently dry and mount using DePex mounting fluid and coverslip.

Summary

The first case of eosinophilic meningoencephalitis due to *A. cantonensis* is reported in a 27-year-old Chinese from West Malaysia. A history of a diet of "raw" prawns and other shellfish, raw lettuce and other salad greens with symptoms of headache, fever, stiffness of neck and back (meningoencephalitis) and generalised body pains and weakness is considered of importance. The presence of larval stages of the parasite, Charcot-Leyden crystals and high eosinophilia in the CSF was of value in the diagnosis of parasitic eosinophilic meningoencephalitis.

Physicians should consider the infection in the differential diagnosis in suspected cases with eosinophils in the CSF and the dietary history may be of importance.

References

1. Alicata, J.E. (1964). Land crabs as probable paratenic hosts for the infective larvae of *Angiostrongylus cantonensis*. *J. Parasit., 50,* Suppl., 39.
2. Alicata, J.E. (1965). Biology and distribution of the rat lungworm, *Angiostrongylus cantonensis* and its relation to eosinophilic meningoencephalitis and other neurological disorders of man and animals. In Advances in Parasitology, Ed. by B. Dawes, Vol. 3, Academic Press, London & New York, pp. 223.
3. Alicata, J.E. (1969). Parasites of man and animals in Hawaii. S. Karger. Basel (Switzerland) p. 38.
4. Alicata, J.E. & Brown, R.W. (1962). Observations on the method of human infection with *Angiostrongylus cantonensis* in Tahiti. *Can. J. Zool., 40.* 755.
5. Bisseru B. (1971). The prevalence of *Angiostrongylus Cantonensis* larvae collected from the giant African snail, *Achatina Fulica* in West Malaysia and Singapore. S.E. Asian *J. Trop. Med. Publ. Hlth.* 2, 523.
6. Bisseru, B. and Perianan, A. (1968). *Angiostrongylus cantonensis* (rat lungworm) infection in laboratory-

bred snails. Proc. Sem. Filariasis and Immunology of Parasit. and Lab. Meeting. Singapore. p. 236.

7. Bisseru, B. and Verghese, T. (1970). Natural infection of the land mollusc *Achatina fulica* with *Angiostrongylus cantonensis* in Malaya. *S.E. Asian J. Trop. Med. Pub. Hlth. 1*: 294.
8. Jindark, K. and Alicata, J.E. (1965). A case of parasitic eosinophilic meningoencephalitis in Vietnam probably caused by *Angiostrongylus cantonensis*. *Ann. Trop. Med. Parasit. 59*: 294.
9. Latonio, A.A. (1971) The giant African snail, *Achatina fulica*, a new threat to public health. *Trans. R. Soc. trop. Med. Hyg., 65*: 22.
10. Lim, B.L. and Heyneman, D. (1965). Host-Parasite studies on *Angiostrongylus cantonensis* (Nematode: Metastrongylidae) in Malaysian rodents: natural infection of rodents and molluscs in urban and rural areas of central Malaya. *Ann. trop. Med. Parasit., 59:* 425.
11. Lim, B.L. and Krishnansamy, M. (1970). Preliminary survey for *Angiostrongylus cantonensis* in edible freshwater snails in West Malaysia. *S.E. Asian J. Trop. Med. Publ. Hlth. 1:* 295.
12. Lim, B.L., Ow-Yang, C.K. and Lie, K.J. (1965). Natural infection of *Angiostrongylus cantonensis* in Malaysian rodents and intermediate hosts and preliminary observations on acquired resistance. *Am. J. Trop. Med. Hyg. 14:* 610.
13. Punyagupta, S. (1965). Eosinophilic meningoencephalitis in Thailand: summary of nine cases and observations on *Angiostrongylus cantonensis* as a causative agent and *Pila ampullacea* as a new intermediate host. *Amer. J. Trop. med. Hyg. 14:* 370.
14. Punyagupta, S., Juttijudata, P., Bunnag, T. and Corner, D.S. (1968). Two fatal cases of eosinophilic myeloencephalitis, a newly-recognised disease caused by *Gnathostoma spinigerum*. *Trans. Roy. Soc. trop. Med. Hyg., 62:* 801.
15. Rosen, L., Laigret, J. and Bories, S. (1961). Observations on an outbreak of eosinophilic meningitis on Tahiti, French Polynesia. *Am. J. Hyg., 74:* 26.
16. Smit, A.M. (1962). Eosinophilic meningitis at Kisaran (Indonesia) and the problem of its etiology. *Bull. Soc. Path. Exot. 55:* 722.
17. Smit, A.M. (1963). Eosinophilic meningitis. *Trop. Geogr. Med. 15:* 225.
18. Watts, M.B. (1969). Five cases of eosinophilic meningitis in Sarawak. *Med. J. Malaya, 24:* 89.

Intracranial hypoglossal neurinomas—
A report of two cases

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INTRACRANIAL NEURINOMAS of the hypoglossal nerve are indeed rare in the experience of most neurosurgeons. A review of the literature by Ignelsi and Bucy in 1967 revealed only nine documented cases of this tumor of the hypoglossal nerve. They added a tenth case to the literature. At that time, these authors emphasised the need for elective tracheostomy following surgical extirpation of the tumor, if the high surgical mortality and morbidity were to be reduced. Their patient survived in spite of being seen late in the course of his disease.

We would like to report two cases of hypoglossal neurinoma that were successfully treated by surgical extirpation of the tumor and elective immediate post-operative tracheostomy. Further, we would like to emphasise two points. Firstly, that during myelography the pantopaque column should be carried well into the cisterna magna if these tumors are to be recognised. If one were to be satisfied with a normal cervical myelogram, one would certainly miss diagnosing these tumors at myelography. Secondly, the possibility of the development of hydrocephalus post-operatively should be borne in mind. Delay in recognising this almost led to the demise of one of our patients.

Case Report I—J.S. NS: 5506/70

The patient, a 40-year-old Punjabi, was admitted into the medical service of this hospital on 17.2.70. He was referred to the Department of Neurosurgery on 22.2.70 when he gave the following history.

He had apparently been well until a year ago when he developed left-sided headaches, usually frontal and occipital in location, associated with nausea and a sense of vertigo whenever he climbed stairs. His work entailed using a ladder periodically and whenever he did so, he became unsteady on his feet and had a sense of spinning around. Two months prior to his admission, he noticed an unsteadiness of his gait associated with buzzing in his ears. At about this time, his speech also began to slur and he was troubled with pricking and pulling sensations in both his hands, especially at night. He had difficulty enunciating words and this had progressed to the point that he had great difficulty in making himself understood. Further he had begun to drool saliva at about this time.

His family and past history were unremarkable.

On examination, he was a well-built man with

Fig. 1: View of the tongues of patients in Case Reports I and II.

a pulse rate of 84 per minute, respirations 18 per minute, and blood pressure of 100/80 mm. Hg. There were no cafe au lait spots to be seen. His main findings were on examination of the central nervous system. Review of his various other systems revealed no abnormality.

Examination of the central nervous system revealed a conscious, rational and obviously dysarthric individual. His pupils were equal and reactive to light and accommodation. Funduscopy showed early bilateral papilledema. There was a horizontal nystagmus on looking to the left with the fast component to the left and mild weakness of his left 6th nerve. The most remarkable finding was a hemiatrophy of his tongue on the left side with marked fasciculations bilaterally. There was also flattening of the soft palate on the left but the gag reflex was intact. In addition to an intention tremor, he had a poor heel-to-knee test on his left side. Further there was considerable decomposition of movement on the left side. His gait was broad based and he was markedly ataxic with a tendency to fall to the left. Rhomberg sign was positive. His motor power was, however, good on both sides. His reflexes were brisk bilaterally but they were somewhat more so on the left side. There was no Babinski response. In addition, there was some increase in tone, especially in both lower limbs.

Pertinent investigations

Lumbar Puncture revealed an opening pressure of 210 mm. of C.S.F. The C.S.F. was clear and colorless.

Cythology revealed — 25 cells/cu. mm. mostly consisting of lymphocytes. The C.S.F. protein was 128 mg.%, globulin positive, sugar 62 mg.%, chlorides 120 meq/litre.

The following day, a pantopaque myelogram was undertaken which revealed a normal cervical myelogram. As we were suspecting a lesion of the 12th nerve posterior fossa, pantopaque cisternography was carried out, and this revealed a complete block to the dye column just rostral to the cisterna magna. The myelographic appearance was compatible with an intradural extramedullary mass lesion. Accordingly, a posterior fossa exploration was performed on 3.3.70.

A midline craniectomy was performed over the occipital bone following division and retraction of the cervical neck muscles. Laminectomy of C1 and C2 was also accomplished. Exploration of the

cerebello-medullary junction revealed a well circumscribed reddish yellow tumor measuring 1 x ¾ inches attached to the 12th nerve. About half of the tumor was disposed anterior to the medulla oblongata which had been pushed upwards and to the right by this tumor. The spinal accessory nerve was also stretched and pushed downwards and appeared to skirt the inferior pole of this tumor. An incision was then made over the tumor and its contents removed with forceps, spoons and suction. Following adequate decompression of the tumor contents, the capsule of the tumor was carefully delivered and dissected free from the medulla oblongata. It was then removed. Adequate care was given to preserve the blood supply to the medulla oblongata. Following hemostasis, the wound was closed in layers. The patient was then returned to the supine position and elective tracheostomy was performed. The patient was then returned to the intensive care unit.

Post-operatively, the patient had some difficulty in handling his secretion. For some four days, he drooled saliva and had to constantly resort to wiping his mouth dry. He otherwise made an uneventful recovery and by the fifth day post-operatively, he was able to handle his own secretions well and take oral fluids. A week later, he was able to walk with assistance and the tracheal stoma was closed. He was discharged from hospital on 24.3.70. At the time of his discharge, he continued to have some unsteadiness in his gait but he was ambulatory and well.

The patient was seen periodically at bi-weekly intervals from the time of his discharge. On his fourth visit, he complained of dizziness and a tight feeling in the back of his head and neck. Examination of the patient did not reveal any gross abnormality besides his unsteadiness which had been evident at the time of his discharge. Two days later, he was readmitted into the hospital acutely ill, complaining of severe headaches and pain in the nape of his neck and top of his head. In addition, he was nauseated and had had four episodes of projectile vomiting. When seen, he was irritable and violent. Examination now revealed early papilledema associated with a tense posterior fossa at the operational site. In addition, he was lethargic, resented examination and tended to curl up and sleep. However, when disturbed, he would react most boisterously and angrily. He was immediately taken to the operating room and after adequate preparation of his head and neck, a Right Ventriculo-Atrial shunt was planned. At operation, the intraventricular pressure was recorded at 360 mm. of

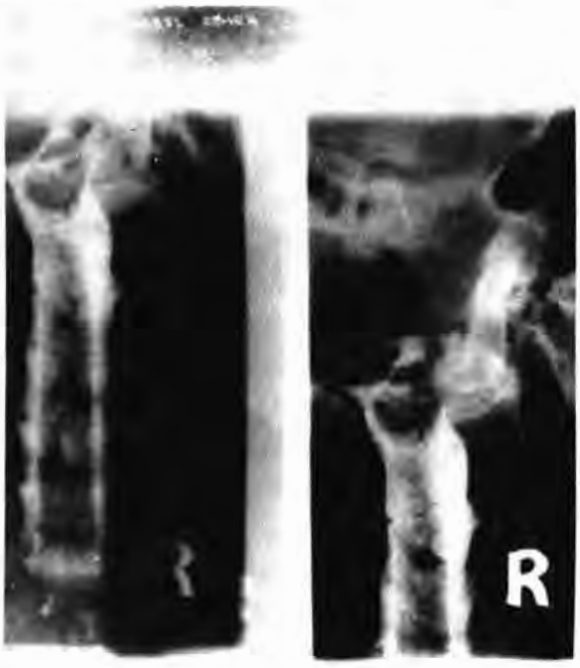

Fig. 2A: Normal cervical myelogram (Case Report I).

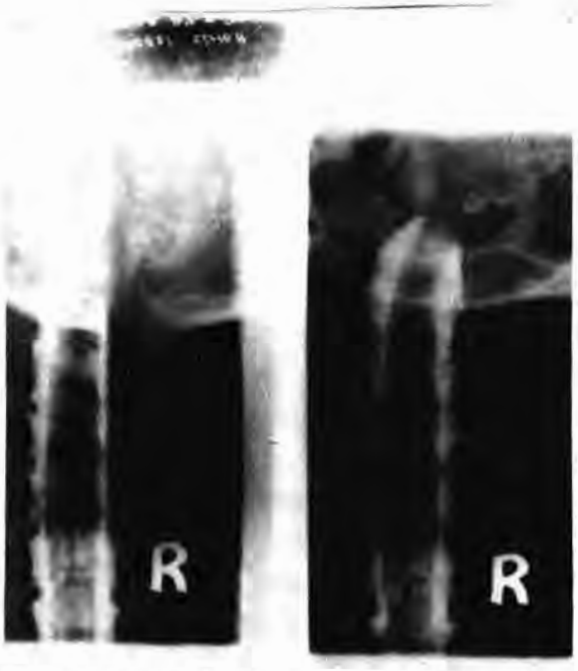

Fig. 2B: Dye in the cisterna magna now reveals the tumor.

cerebrospinal fluid. A right Ventriculo-Atrial shunt, with the aid of a Mischler Pudenz apparatus, was accomplished. Following the shunting procedure, the patient became quite calm and was his usual self again. He was discharged from hospital some eight days later in good condition. He is being followed on an outpatient basis at the present time.

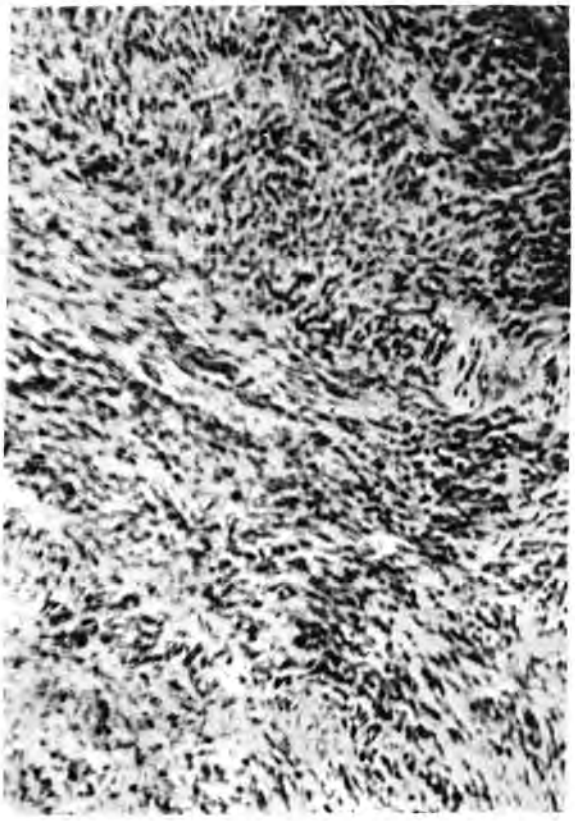

Fig. 3: Histology of the tumor (Case I).

Histopathology

Hematoxylin and Eosin preparations of the tumor removed at surgery revealed appearances fully compatible with those of a neurinoma.

Case Report II—T.P. NS: 6828/71

This 51-year-old Chinese woman was referred in from the Malacca General Hospital with a three-month history of headaches confined to the occipital area of her skull. In addition, she complained of numbness over the left side of her face and loss of taste on the right side of her tongue. Her symptoms began some four months previously and two weeks prior to admission to our center, she had begun to have difficulty in swallowing. On examination, she had a right 7th nerve palsy of the lower motor neuron type and marked wasting of the tongue on the right side. There was hyposthesia of the left side of the face and she had, in addition, corneal anaesthesia on this side. Her left soft palate did not move as well as on the right side. Reflexes were equal 1+, and there was no Babinski response. There were no cerebellar findings. A tentative diagnosis of 12th nerve neurinoma was made and a pantopaque posterior fossa study undertaken. A lumbar puncture to effect the study revealed an opening pressure of 180 mm. of water and a total protein of 114 mg.%, globulins were positive, sugar was 44 mg.%. The posterior fossa pantopaque study revealed evidence of tonsillar herniation with a complete high cervical block.

On 1.6.71, posterior fossa craniectomy was performed. The arch of the Atlas and the lamina of the 2nd cervical vertebrae were also removed. On opening the dura, the tonsillar herniation was confirmed and this was especially marked on the right side. On opening the dura over the cerebellar hemisphere, it was evident that there was a tumor in the region of the right cerebello medullary junction extending backwards between the right tonsil and the medulla. Tumor was greyish in color

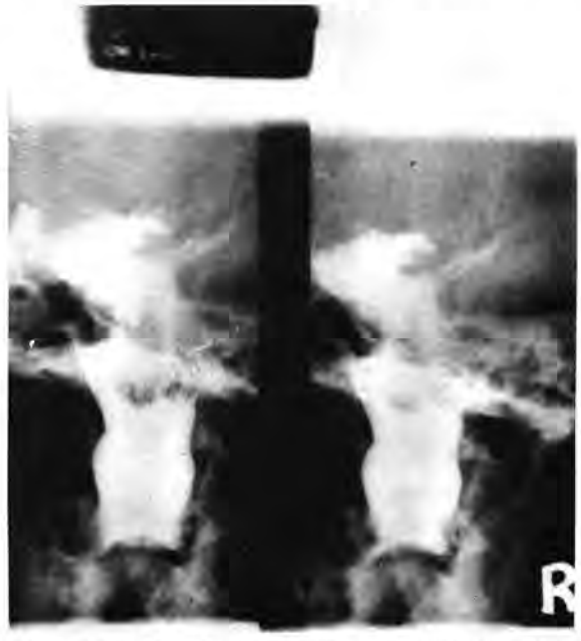

Fig. 4: Positivity of the pantopaque posterior fossa study is obvious (Case II). Note the filling defect secondary to the cerebellar tonsillar herniation.

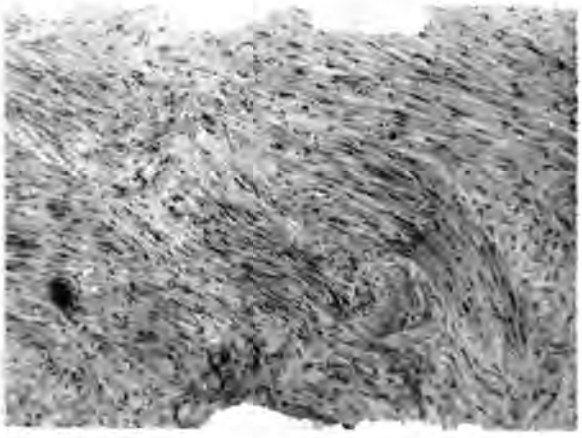

Fig. 5: Histopathology of the tumor (Case II).

and measured 1cm x 1½cm x 1½cm. It was well encapsulated and following internal decompression of the tumor, the posterior lateral and superior walls of the capsule were removed. The antero-medial wall attached to the medulla was left alone as it was considered not amenable to extirpation.

Post-operatively, the patient was subjected to elective tracheostomy for better respiratory management. At the time of her discharge from hospital three weeks later, she was ambulant and well. She was seen in follow-up a month later and she continues to do well.

Histopathology of the tumor removed showed appearances fully compatible with those of a neurinoma.

Summary

Two cases of intracranial neurinoma of the hypoglossal nerve successfully treated by surgical extirpation and elective immediate post-operative tracheostomy are reported. Careful high cervical myelography with the contrast material pushed well into the cisterna magna is necessary if these tumors are not to be missed. The possibility of acute hydrocephalus developing weeks to months post-operatively should be borne in mind if the condition is to be recognised early and treated promptly. The extreme rarity of these tumors in the world literature has prompted us to report these two cases.

Bibliography

1. Haase, E. Neurinoma of the twelfth nerve. *N. Neuropath. exp. Neurol.*, 1946, 5:66-71.
2. Ignelzi, R. J., and Bucy, P. C. Intracranial hypoglossal neurofibroma — case report. *J. Neurosurg.*, 1967, 26:352-356.
3. Scott, M., and Wycis, H. T. Intracranial neurinoma of the hypoglossal nerve. Successful removal — case report. *J. Neurosurg.*, 1949, 6:333-336.
4. Williams, J. M., and Fox, J. L. Neurinoma of the intracranial portion of the hypoglossal nerve. Review and case report. *J. Neurosurg.*, 1962, 19:248-250.

Use of Indomethacin as an anti-pyretic agent in malignant reticulosis

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Introduction

FEVER IS A FAIRLY common symptom of malignant disease (Boggs et al, 1960). Although associable with any type of mitotic disease, fever has been noted to be more frequent in various haematopoietic, (Raab et al, 1960) lymphoreticular (Jackson and Parker, 1946) and renal (Kiely, 1960) malignancies. In most patients with such conditions, fever is due to some accompanying infection (Browder et al, 1961); however, in a considerable number of cases, and according to some workers, in as much as 50 per cent of cases, fever is directly related to the basic disease process (Boggs et al, 1960; Raab et al, 1960; Lobell et al, 1966). The fever thus found in malignant disease, which is due to the disease itself, has however no definite characteristic pattern and hence it has quite rightly been described as "typeless" (Boggs et al, 1960).

When present, whatever may be its cause or nature, fever can be very disquietening for the patient leading to malaise, anorexia, headache, debility and weakness and can be the major cause of the patient's incapacitation (Spear, 1962). Under such circumstances, every attempt should be made to bring the fever under control. If the pyrexia is proved to be due to infection, appropriate therapy is sufficient to combat it. However, in other situations where no proper evidence of infection can be established, suitable anti-pyretic therapy is indicated (Spear, 1962).

It is reasonable to assume that such pyrexial state will subside once the basic disease is brought under control by proper anti-neoplastic chemotherapy but there is always a considerable time interval before such therapy becomes clinically effective and although initially effective, the basic process may become "resistant" to the therapy. This has been shown quite definitely by Boggs and Frei (1960) and they concluded that anti-neoplastic chemotherapy or the duration of the illness may not have a complete effect on the fever associated with the disease. Hence anti-pyretic therapy may be required for a considerable number of patients with these conditions.

A number of anti-pyretic drugs have been used to control this kind of fever in various malignancies. However, in patients with malignant lymphomata, the fever is usually resistant to the commonly used anti-pyretics e.g. aspirin (Spear, 1962). Drugs like aminopyrine (Spear, 1962), phenylbutazone and adreno-cortical steroids (Ranney and Gellhorn, 1957), on the other hand, have been useful in lympho-reticular malignancies, but the incidence of toxicity, particularly of the two former agents, have limited their widespread use.

TABLE I

No.	Age	Sex	Histological Diagnosis	Bone Marrow	Duration of Illness	Main Features
1	36	M	Lympho-sarcoma	Marrow infiltrated with highly undifferentiated blast cells.	7 months	Irregular fever ranging from 37.2°-38.6°. Pallor. Mild icterus. Generalised enlargement of lymph nodes. Liver 4 cm. Spleen 17 cm. Raised Uric Acid. Low gamma globulin. Negative Coomb's Test.
2	12	M	Hodgkin's Disease	Bone marrow not done.	2 years	Irregular fever up to 39.6°C; Anaemia. Enlarged, hard and fixed lymph nodes at both groins a few nodes in cervical regions. Liver 5 cm. Spleen not palpable. E.S.R. raised.
3	43	M	Hodgkin's Disease	A few irregular lymphomonocytoid cells present, but on overt infiltration by Hodgkin's Disease apparent.	4 months	Progressive swelling of neck, axillae and groins. Loss of weight and appetite. Irregular pyrexia ranging from 37.2°-40°C. Pale. slightly icteric. Liver 4 cm. Spleen 6 cm. Generalised lymphadenopathy. Urine N.A.D. Chest X-ray: Infiltration right base. Left hilum slightly enlarged. Liver Function Tests normal. Serum Gamma Globulin low. Blood K.T. negative. Blood Cultures x 6: Negative.
4	52	M	Reticulum Cell Sarcoma	Bone marrow not done.	3½ months	Progressive swelling of neck and groins. Bouts of fever up to 38.6°C with chills and sweating at night. No pallor. Liver, spleen not palpable. Enlarged nodes in neck and inguinal regions. Uric Acid high. Liver functions normal. Gamma globulin high. ESR raised.
5	26	M	Reticulum Cell Sarcoma	No evidence of malignant or blast cell infiltration present	4 months	Hoarseness of voice. Progressive swelling of face and neck. Loss of weight. Bouts of irregular fever ranging 37.2°-39°C. Signs of superior vena cava obstruction due to cervical and mediastinal lymphadenopathy. Liver, spleen not palpable. Chest X-ray — huge tumour mass in antero-superior mediastinum. ESR elevated. Serum proteins normal. Blood cultures negative. Sputum Culture grew Strep. Viridans initially, sterile later.
6	14	M	Lympho-sarcoma	Marrow infiltrated with blast cells	18 months	Presented as a swelling of thyroid gland with respiratory distress. Cervical nodes were enlarged. Gross hepato-splenomegaly. Irregular pyrexia on and off ranging up to 38.4°C. Pale and poor general condition. Uric Acid raised.

TABLE I

Therapy	Response of Fever	Dosage of Indomethacin	Effects after Indomethacin
I.V. and Oral Cyclophosphamide Oral Prednisolone; Probenecid; Chlorambucil; Multiple blood transfusion. Soluble Aspirin (600 mg. 8 hrly.)	Slight initial response to steroids but that was temporary. No response to aspirin.	25 mg. t.d.s.	Patient became afebrile within 6 hours (Fig. 1) of the first dose and remained so during the duration of the therapy. Fever recurred when the drug was discontinued. There were some general signs of improvement e.g. reduction of spleen size, etc. but those could have been due to other coincidental therapy.
Cyclophosphamide Nitrogen Mustard Blood Transfusion. Paracetamol. Soluble Aspirin.	No response	50 mg. q.d.s.	Temperature down within 6 hours of the first dose. Rebound pyrexia on withdrawal, the same cycle repeated to confirm the effects of this drug (Fig. 2). General symptomatic improvement noticed. Slight macular rash during the second course, which cleared up within a day of cessation of therapy.
Nitrogen Mustard. Cyclophosphamide, Blood Transfusion Chlorambucil. Soluble Aspirin.	No response	50 mg. q.d.s.	Afebrile within 6 hours. Improvement in general state of health, increase in appetite. Fever returned when therapy discontinued. No appreciable change in signs.
I.V. Cyclophos-phamide. Paracetamol.	No response	50 mg. q.d.s.	Afebrile in 8 hours. General condition improved. But fever recurred and reached up to 37.6°C on two days during the therapy. On withdrawal, pyrexia was of higher degree.
Deep X-ray therapy for superior vena cava obstruction. Tetracycline. Paracetamol. Soluble Aspirin.	No response	50 mg. q.d.s.	Afebrile in 12 hours. General condition much improved. Although this patient had definite evidence of infection and was successfully treated with antibiotics to eradicate the infection his fever had containued even while on antibiotic. But there was a dramatic cessation of pyrexia when the antibiotic was replaced by Indomethacin. No change in lymph node enlargement.
Cyclophosphamide Prednisolone 6 Mercaptopurine. Methotrexate. Vincristine. Blood Transfusion. Soluble Aspirin. Paracetamol.	No response	50 mg. q.d.s.	Temperature normal in 8 hours, Great improvement in general condtion. Sense of well being and increase in appetite. Pyrexia returned on withdrawal. Lymph nodes slightly smaller during therapy.

Indomethacin, I-P-Chlorobinzoyl-5-Methoxy-2-Methylindole-3-acetic acid, a well-known non-steroid anti-inflammatory and analgesic agent (Hart and Boardman, 1963, Thompson & Percy, 1966) has also been noted to have strong anti-pyretic properties (Winter et al, 1963). But not until recently (Walker et al, 1966) has it been clinically tried with success for its latter effects and it has been effective in controlling fever promptly in a fair proportion of cases with malignant reticuloses and leukaemia who had not responded to other anti-pyretic agents (Silberman et al, 1965; Begemann et al, 1966; Lusch et al, 1968; Kiely, 1969). A small number of patients with such conditions was tried on Indomethacin to observe the latter's effect on the patients.

Materials and Methods

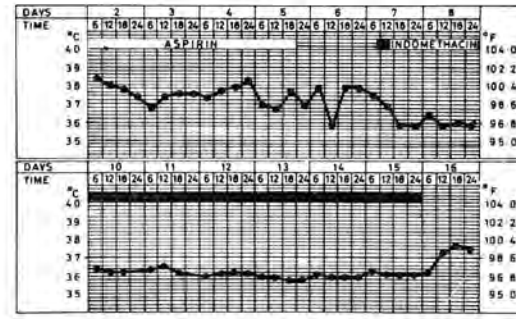
All patients with one of the malignant lymphomata, who were admitted at least once into the University Hospital between July 1969 and March 1970, were taken into consideration for the study. Age, sex or race of the patient were disregarded and so was the duration of the illness. The basic disease had been firmly diagnosed on the histology of lymph node biopsy material in each case. Patient's running fever, with at least one buccal temperature reading above 37.4°C (99°F) each day for three consecutive days, was closely studied for any secondary infection. Investigations, such as repeated cultures of blood, urine, sputum and radiological examination of chest, were carried out to exclude infection. Of course, these tests were carried out in addition to other haematological and biochemical tests. Finally, six patients were selected for anti-pyretic therapy as no definite evidence of infection could be elicited in them or they continued to remain febrile even after adequate therapy with appropriate antibiotics. Estimation of haemoglobin, total and differential leucocyte counts, platelet counts, EST, liver function test, serum protein, serum uric acid, urine microscopy, etc., were carried out on all patients. Bone marrow examination was done on four of them.

Almost all the patients had been on some form of cytotoxic therapy, the nature of the drug and the number of courses administered were dependent on the diagnosis and the duration of the disease. All the patients were kept on a 6-hourly temperature chart when 25-50 mg. of Indomethacin were administered orally three to four times a day. In most cases, the drug was discontinued after a few days and re-administered a few days later to substantiate its anti-pyretic effects. All patients were closely observed and repeatedly examined and interrogated to find out any undesirable effects of the drug and also to note whether this had any other beneficial effects on the basic disease manifestations.

Results

Short clinical descriptions and the effects of Indomethacin in all the six patients are summarised in Table I. Almost all the patients were given regular dosage of aspirin prior to Indomethacin therapy but had not responded. All six cases responded successfully to Indomethacin with prompt relief of fever within 6-8 hours. The fever, however, returned within 10-12 hours in each case when the drug was withdrawn. Only one patient (Case 4) did not manifest a complete response. Although his pyrexia had settled initially, he continued to have occasional spikes of temperature whilst on Indomethacin, but the temperature range was much lower than before. No undesirable or serious side effects were noted which could have been attributed to this drug. However, therapy in one patient (Case 2) had to be discontinued because of skin rash. No one had any difficulty in tolerating this drug by mouth. Although some reduction in the lymph node size were noted in two patients, it is doubtful whether this was due to this drug or due to concurrent cytotoxic therapy. Bone marrow was involved in two patients but did not seem to

CASE 1



CASE 2

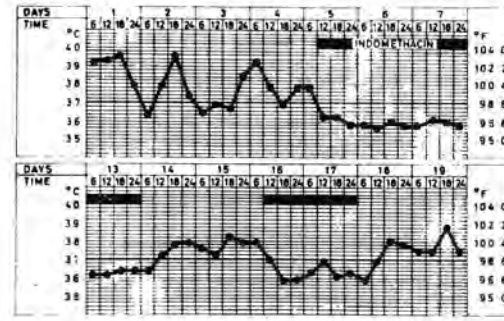


Table II. Results of Previously Published Trials.

Workers	Diagnosis Based on Lymph Node or from Marrow Biopsy					Total No. of Cases	Daily Dosage of Indomethacin	Response to Fever		Side Effects
	Hodgkin's Disease	Raticulum Cell Sarcoma	Lympho-Sarcoma	Acute Leukaemia	Other Malig. Tumour			Complete	Partial	
Silberman et al (1965)	9	—	—	—	—	9	25 mg. t.d.s. to 50 mg. q.d.s.	7	2	Nil
Begemann et al (1966)	8	—	—	—	—	8	25 mg. t.d.s. to 50 mg. q.d.s.	7	1	Nausea 2 Abdominal pain 2
Lusch et al (1968)	8	2	—	16	4	30	25 mg. t.d.s. to 50 mg. q.d.s.	14	6	Skin Rash 1 Abdominal pain 1
Kiely (1969)	3	—	—	1	1	5	50 mg. q.d.s.	5	—	Nil
Present Series	2	2	2	—	—	6	25 mg. t.d.s. to 50 mg. q.d.s.	5	1	Skin Rash 1

have influenced the anti-pyretic effect of this drug. There was no evidence, however, to suggest that Indomethacin had any effects on the primary disease or it exerted any synergistic or antagonistic influence on the cytotoxic agents.

Discussion

The pathogenesis of fever of non-infective origin seen in patients with malignant reticuloses is obscure and there is good reason to believe that the majority of these fevers are not due to "occult" infection, tissue necrosis, therapy, hypermetabolism or psychogenic factors (Boggs and Frei, 1960). However, in recent years the mechanism of this pyrexia is being more and more understood. It has been suggested that neoplastic cells may secrete pyrogen or interact with other normal tissues (Atkins and Snell, 1963) to enhance its relase in a similar way as injected endotoxins stimulate the release of endogenous pyrogen from granulocytes (Bennett and Beeson, 1953; Atkins and Wood, 1955). This pyrogen, presumably by its effect on the anterior hypothalamus and pre-optic areas, produces pyrexia (Cooper, Cranston and Honour, 1967). In fact, pyrogenic proteins have been shown to be produced by the neoplastic cells in Hodgkin's Disease and the activity of such pyrogen has been demonstrated in the urine of patients with Hodgkin's Disease (Shimaoka and Sokal, 1967). Anti-pyretic effects of Cycloheximide, an inhibitor of pyrogenic protein synthesis, in these conditions would also support the same pathogenesis (Young and Karnofsky, 1967). This latter agent, however, is not commercially available.

In 1963, Indomethacin was first shown to be a fairly potent anti-pyretic agent in pyrogen-induced fevers of experimental animals (Winter et al, 1963). Since then, this drug has been used in various febrile diseases of children and has been shown to be superior to aspirin (Walker et al, 1966). Its effects in pyrexia of malignant reticuloses were first noted in 1965. However, there has not been many published observations on this aspect in comparison with voluminous literature on Indomethacin's anti-inflammatory or analgesic effects on various rheumatic diseases. In Table II, the results of all the publications regarding this drug's anti-pyretic action on malignant lympho-reticular diseases are summarised.

From the published reports and the present study, it is quite evident that Indomethacin is a very effective anti-pyretic in controlling the fever of malignant lymphomata. Although its pharmacological mechanism of anti-pyresis is not definitely known, it may be suggested that it is due to its anti-pyrogenic (Winter et al, 1963) or anti-inflammatory effects (Begemann et al, 1966).

A number of side effects, especially its gastric ulcerogenic properties (Lovgren and Allander, 1964), have been noted with Indomethacin therapy

in rheumatic diseases. However, not many untoward effects were encountered when the drug was used in the present context. It might be that the relatively shorter duration of therapy could have been the cause of this paucity of side effects.

Summary and Conclusion

In six histologically confirmed cases of malignant reticuloses, the associated pyrexia of non-infective origin have been successfully treated with oral Indomethacin. No serious untoward effects were noted. It can be concluded, in agreement with previous workers, that Indomethacin may be used as a safe and useful anti-pyretic agent in these conditions. The pathogenesis of fever in malignant diseases and the effect of Indomethacin thereon are breifly discussed.

Acknowledgements

I would like to thank Dr. H. O. Wong and Dr. M. Somasundaram for allowing me to study patients under their care during their stay in the University hospital.

References

1. Atkins, E. and Wood W.B. (1955). Studies on pathogenesis of fever: II. identification of endogenous pyrogen in blood stream following injection of typhoid vaccine; *J. Exp. Med.* 102: 499-516.
2. Atkins, E. and Snell, E.S.S. (1963). Pyrogenic properties of various tissue extracts in the rabbit; *J. Physiol.* 169: 478.
3. Begemann, H., Trepel, F. & Schaarschmidt, A. (1966) Indomethacin in the treatment of Hodgkin's Disease; clinical experiences with Indocid published by Merck, Sharp and Dohme Intern.
4. Bennett, I.L., and Beeson, P.B. (1953). Studies on pathogenesis of fever; II. Characterisation of fever producing substances from polymorphs, nuclear leucocytes and from fluid of sterile exudates; *J. Exp. Med.* 98: 493-508.
5. Boggs, D.R., Frei, E. III (1960). Clinical studies of fever and infection in cancer; *Cancer* 13: 1240-53.
6. Browder, A.A., Huff, J.W. & Petersdorf, R.G. (1961) The significance of fever in neoplastic disease: *Ann. Int. Med.* 55: 932-943.
7. Cooper, K.E., Cranston, W.I. & Honour, A.J. (1967). Observations on the site and mode of action of pyrogens in the rabbit brain; *J. Physiol.* 191: 325-337.
8. Hart, F.D. & Boardman, P.L. (1963). Indomethacin — A new non-steroid and antiiflammatory agent; *Brit. Med. J.* 2: 965-970.
9. Jackson, H., and Parker, F. (1946). Hodgkin's Disease VI. Clinical diagnosis—; *New Eng. J. Med.* 234: 37-41.
10. Kiely, J.M., (1966). Hypernephroma: The Internist's Tumour; *Med. Clin. N. Amer.* 50: 1067-83.
11. Kiely, J.M. (1969). Symptomatic control of fever in lymphoma and leukaemia; *Mayo Clin. Proc.* 44: 272-280.
12. Lobell, M., Boggs, D.R., & Wintrobe, M.M. (1966). The clinical significance of fever in Hodgkin's Disease; *Arch. Int. Med.* 117: 335-342.
13. Lovgren, O., & Allander, E. (1964). Side effects of Indomethacin; *Brit. Med. J.* 1: 118.
14. Lusch, C.J., Serpick, A.A., and Slater, L. (1968) Antipyretic effect of Indomethacin in patients with malignancy; *Cancer* 21: 781-6.
15. Raab, S.O., Hoeprich, P.D., Wintrobe, M.M. & Cartwright, G.E. (1960). The clinical significance of fever in acute leukaemia; *Blood* 16: 1609-28.
16. Ranney, H.M., & Gellhorn, A., (1957). The effect of massive prednisone and prednisolone therapy on acute leukaemia and malignant lymphomas: *Am. J. Med.* 22: 405-413.
17. Shimaoka, K. and Sokal, J.E. (1967). Pyrogen in the urine of patients with Hodgkin's Disease (abstr.) *Clin. Res.* 15: 340.
18. Silberman, H. R., McGinn, T.G., and Kremer, W.B. (1965). Control of fever in Hodgkin's Disease by Indomethacin: *J.A.M.A.* 194: 597-600.
19. Spear, P.W. (1962). The use of aminopyrine to control fever in Hodgkin's Disease; *J.A.M.A.* 180: 970-972.
20. Thompson, M., and Percy, J.S. (1966). Further experience with Indomethacin in the treatment of rheumatic disorders; *Brit. Med. J.* 1: 80-83.
21. Walker, S.H., Hoffman, S.H., Silverstone, L., & Di Moia, F. (1966). The antipyretic effect of Indomethacin — A clinical study of the use for fever states in man; *Clin. Paed.* 5: 204-8.
22. Winter, C.A., Risley, E.A., & Nuss, G.W. (1963) Anti-inflammatory and antipyretic activities of Indomethacin; *J. Pharm. Exp. Ther.* 141: 369-376.
23. Young, C.W. & Karnofsky, D.A. (1967). The necessity of protein synthesis for fever in Hodgkin's Disease (abstr.) *Proc. Am. Assn. Cancer Res.* 8: 75.

Transvestism — treatment by aversive therapy

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Introduction

THE PHENOMENON OF TRANSVESTISM deals with the dressing in female clothes by the male or vice versa which produces a clear cut, unquestioned genital excitement, generally leading to masturbation and orgasm. Such individuals are initially excited by a single or a few garments of the opposite sex, very often preferring particular items. In some cases, there is a gradual spread to the wearing of more and more garments of the opposite sex until the subject finally dresses from head to foot and from the skin outwards.

Very often, there is an intense yearning to become a member of the opposite sex so much so that he adopts female mannerisms and enters into the female behavioristic world. In this group, there is not only the fetishistic excitement which is important, but an increasing sense of identification with the opposite sex.

Even in ancient times Herodutus (Krafft-Ebing, 1947) referred to it as the mysterious 'Skythian illness' on the northern shores of the Black Sea, where apparently normal men were clothed in female apparel, undertook women's work, and generally exhibited feminine characteristics and behaviour. In classical Grecian literature, (Fenichel, 1930) Hercules donned female clothes to serve his mistress, Omphale.

According to Kinsey (1953), a transvestite is "an individual who prefers to wear the clothes of the opposite sex and who desires to be accepted in the social organisation as an individual of the opposite sex". However, Lukianowiez (1959) extended Kinsey's definition by stating that the transvestite had "a persistent morbid urge to undergo conversion operation". He is of the opinion that the phenomenon is not homogenous but ranged from complete transvestism to automonosexual transvestism (i.e. a male transvestite seeking the love of a mannish woman.) However, Stoller (1971) differentiated transvestism from transexualism and fetishistic cross-dressing. "These men do not take effeminate roles in real life. For them, their penises are not only a source of the greatest erotic pleasure, but they consider themselves as men." The very presence of a penis beneath female garments is exciting and erotic. In his survey of 390 cases of transvestism, Bruce (1965) noted that the majority were heterosexual men preferring women to men in their sexual fantasies.

The works of Havelock Ellis (1927) on sexual psychology considered transvestism as a modification of bisexuality and that over-identification was an

In male garments.

In female garments.

important factor in its development. Fetishism and transvestism have been observed to be closely allied together, although transvestites typically manifest more effeminacy and masochism. Fenichel (1930) stated that in both cases the characteristic overvaluation and the image of a "phallic woman" was preserved.

Various authors, (Ellis, 1927; Oklon & Sherman, 1944; Krafft-Ebing, 1947) have commented on the transvestite's frequent acute conscious striving to become a woman, which might even lead to the seeming paradox of attempts at self-castration. They frequently become psychically impotent and often resort to crime to satisfy their sexual gratifications, (Peabody et al, 1953).

Aetiology of Transvestism

Environmental, psychodynamic and genetic factors have been suggested as possible causes for transvestism.

(a) Psychological Theories

"Parental rejection" of a child because of its "unwanted" sex has been attributed to the psychogenesis of transvestism by Gutheil (1954) and Baradhal (1953). This results in feelings of inferiority and insecurity and unhealthy premature preoccupation with the problems of sexual identification, leading to a confusion of one's own sexual identity, and finally to transvestism. Furthermore, being rejected by their own parents for their sex, some transvestites develop a hostile, sado-masochistic attitude towards their own genitalia and have either to hide their genitalia under female garments or completely remove their sexual organs. Some do make serious attempts at self mutilation. In these ways, there is an attempt to acquire the acceptance and love of rejecting parents.

Most transvestites allege that they have been dressed in "girl dresses" at an early age and

this may perplex them and cause sexual misidentification.

However, Bender and Paster (1941) suggested that transvestism developed from the child's urges to achieve the favoured status of a "little girl" and his consequent pretence of being one. It has also been suggested that close visual contact with either mother or sister may lead to "a state of primary identification" with the female sex.

Furthermore, the reversal of parental roles, in the form of an aggressive mother and a submissive father, may lend identification with the wrong parent. Stoller (1967) surveyed 32 transvestites and their womenfolk and stated that all the women shared attributes of taking a conscious intense pleasure in seeing males dressed as females. All had a common fear of masculinity and were envious of males. He categorised them into men haters, succourers and the symbiote (i.e. a woman who compels and encourages her sons to dress in female clothes). The father, on the other hand, may also be a cold, distant man and is perceived by the patient as a cold, rigid, powerful man.

(b) Genetic Theory

There is no evidence that transvestism is of hereditary origin. The findings of Barr and Hobbs (1954) show that all male transvestites bear the male XY chromosome complex. On the contrary, Laikos (1967) published an interesting case of familial transvestism. In a family of eight, three members, father and two sons, were all transvestites.

Most authorities agree that the first manifestations of this pattern of behaviour occurred in early childhood or early adolescence, and that there is a predominance among the male sex. However, Lukianowiez (1959) found that more than half the reported cases were heterosexual males who were married and had children.

(c) Psychoanalytical Theory

Freud (1910) agreed that a constitutional predisposition could occur in cases of transvestism, but indicated that the actual determinant for the deviation might be an accidental circumstance from early sexual development.

Fenichel (1945) asserted that the transvestite unconsciously identified with the "phallic woman" and that he held a place somewhere between the passive homosexual and the fetishist. "While the homosexual, incapable of loving an object who lacks a penis, identifies with his mother in order that he may seek out father, or narcissistically, a representative of himself, the transvestite perpetuates the belief in mother's penis and at the same time identifies with the 'phallic woman' ".

Peabody et al, (1953) demonstrated the idea of a "phallic woman" in a transvestite's dream where a 21-year-old man "looked under a girl's skirt and saw male genitalia". This patient had extreme difficulty in consciously accepting the absence of a penis in the female. The fear of castration and its denial through the creation of a "phallic woman" is often precipitated by an exhibitionistic behaviour of the important female figure in the transvestite's early childhood, representing most often mother or sister.

Clinical Manifestations

In the milder cases, there is merely a desire to wear female clothes, and these people are often betrayed by the choice of occupation and hobbies of a feminine nature. Some cases compromise by permanently wearing female panties on top of male clothing or by dressing in female attire for short periods of the day in privacy and admiring themselves in front of a mirror.

The more severe cases have an intense yearning for dressing in female clothes almost resembling an obsessive compulsive neurosis. Lukianowiez (1959) stated that an exaggerated desire "to be a woman" may lead to paradelusional claims of "menstruating" from the anus and urethra. Some even desire to bear children and harbour fantasies of conception and child birth, and dress up as if they are pregnant. Undoubtedly such abnormal urges create frustration, poor social adjustment, guilt and depression.

Like all sexual deviations which usually overlap and merge, almost every case of transvestism display certain features of other sexual abnormalities. Homosexual manifestations, fetishistic, narcissistic and exhibitionistic traits and sado-masochistic behaviour may be associated with transvestism. A rare form of "masochistic auto-erotic transvestism" as the "strangulation masochism" was described by Guthiel (1954). The masturbatory practices consist of dressing and making up as a female and performing the act of self strangulation leading to the threshhold of asphyxia. The constriction of the neck is used as sexual stimulant and once orgasm is reached, the constriction is relaxed.

No one actually knows the prevalence of transvestism within the community, as only a mere

handful come to the notice of doctors and psychiatrists.

Treatment of Transvestism

While most authors advocate psychotherapy in one form or another, the process according to Ostow (1953) has to be intensive, prolonged and psychoanalytically-orientated. However, most forms of psychotherapy seem to help the patient adjust to his abnormality rather than remove his symptom. Ostow even suggested that surgical transformation may help in some cases.

The treatment of transvestism by behaviour therapy appears to have been more successful than that of psychotherapy. Barker et al (1961); Glynn and Harper (1961) treated cases by aversive therapy. Patients were given aversive stimuli in the form of apormorphine injections. Although treatment was reported to be successful, the technique was time consuming, expensive, extremely unpleasant to the patient and used a lot of hospital staff.

A suggestion was made by Rachman in 1961 for the greater use of faradic aversion conditioning as opposed to chemical aversion, as it permitted more precise control of conditioning, greater flexibility in manipulation and more accurate and systematic measurements of patients' specific responses. Besides, it was less unpleasant for the patient.

After noting the disadvantages of the apomorphine/emetine method of conditioning, Barker (1963) treated another case by electrical aversion. The patient was made to stand on an electrified grid at frequent intervals while he dressed in female clothes, before a full length mirror. In 1965, he conducted a controlled trial and showed that the electrical aversion deconditioning was more advantageous than chemical aversive stimulation. Subsequently, Marks and Gelder (1967) treated five cases successfully with faradic aversion. Associated symptoms changed as the main symptoms were treated. The authors ascribed most of the changes as due to aversion.

Case Report of Transvestism treated by Aversion Therapy

The patient, a 24-year-old Chinese male factory worker, was referred by his company doctor for transvestite behaviour since the age of 11 years. Of late, he had become depressed, uneasy, thinking that he was going "mad". His concentration deteriorated and he suffered constant headaches, giddiness and insomnia. He wanted to become "a normal man" again and wished to get married and enjoy a normal family life. Furthermore, he was afraid that sooner or later his family would discover his perversion.

Family History

His mother, 45 years old, a Chinese schoolteacher, is a dominating woman. Contact and communication between them was minimal. His father, a headmaster of a Chinese school, died at 49, ten years ago. He described him as "a real man, smart and with guts". He thought he identified more with his father than with his mother.

There are 7 siblings, (4 girls and 3 boys) of which he is the fourth child. Generally, the family is loosely knit and very little communication exists between family members.

Sexual History

At the age of 8, his 10-year-old sister seduced him and pulled his penis to her vulva. She took the active role of the male, play-acting sexual intercourse. This act frightened and upset him, causing severe pain to his penis, and resulted in the fear of further seduction by his sister.

When he was 11 years old, his 15-year-old brother introduced him to pornographic pictures belonging to his parents, which resulted in his first sexual stimulation. A few days later, he craved to be like the nude women in the pictures and to wear female underwear and garments. As a result, he stole his sister's brassieres, wore them, stripped himself, masturbated and imagined having sexual intercourse with a male. He was sexually aroused, excited, frightened but obtained a relief from sexual tension. He indulged in this perversion four to five times a week till he was 15 years old, when he felt lethargic and suffered from poor concentration. He began collecting nude female pictures and harboured intense wishful ambivalent fantasies of transvestism and normal heterosexual urges.

Initially, the masculine fantasies were more pronounced but at the age of 19 years, he experienced overpowering urges to be transformed into a female and take the feminine role. Subsequently he started bathing daily with the brassieres on (stuffed with cloth) imagining himself as a female nude. He would thrust his penis into the bathroom floor outlet and masturbate. Between 16 to 19 years old, he made four unsuccessful attempts at raping his younger sister and three very young girls, while they were asleep. On each occasion, he experienced ejaculation before penetration. He felt so frustrated that he even unsuccessfully attempted bestiality on his sister's bitch.

By 21 years old, he started buying brassieres (7 pairs) and blouses and slept clothed in them. He conjured fantasies of being married to a man and having sexual relations, and pretended to be pregnant by stuffing old clothes under his blouse. He even ingested his own seminal fluid with the fantasy of becoming pregnant. He would tie his pillow and blanket into the image of a man, fitted it with a "wooden or plasticine penis" and performed the sexual act through a hole cut in the front portion of his underwear, followed by masturbation.

During the floods of January 1971 the patient, then 24 years old, volunteered to collect old clothing for flood victims. He was immensely thrilled at acquiring female clothing and started wearing them and admiring himself before the mirror and masturbating. As the craving for feminine transformation increased, he felt like castrating himself and desperately searched for literature on the surgery of sexual transformation. By this stage, he was sleeping fully dressed in female garments. However, this resulted in his becoming very confused, depressed, complaining of lethargy, poor concentration, dizziness, headaches and insomnia. He was referred for treatment at this stage.

Techniques of Therapy

The following strategy was adopted:—

(1) Initial assessment.
(2) Aversive therapy by electrical aversion.
(3) Aversive therapy by the use of the patient photographed in female clothes.
(4) Supportive psychotherapy.

(1) Initial Assessment

This patient presented with intensely morbid transvestite urges and behaviour and developed secondary symptoms of anxiety, guilt and depression. His motivation was good and he was determined to go through all lengths to "become normal again".

He was asked to bring along all the female garments that he wore and to grade them according to the degree of sexual arousal. He was persuaded to handle them one at a time and associate freely and fantasise aloud. The articles of clothing that excited him by order of sexual arousal were:—

— padded brassieres (strongest arousal)
— semi-transparent blouse
— petticoats
— pink negligee
— panties
— white mini-skirt
— lady's vest (least arousal)

He experienced two conflicting emotions when he saw a female or wore or handled female clothes:

(a) *Transvestite thought*: a wish to possess a body like hers, and to be transformed into a female and have sexual relations with a male.
(b) *Masculine thought*: a weaker thought that he would like her to be his wife. Almost invariably the transvestite thought gained dominance. The technique of aversion therapy was clearly explained to him.

(2) Aversive Therapy by Electrical Shock

He was told to handle the female garments from those of least arousal to strongest arousal, and persuaded to think subjectively aloud. When the transvestite thought occurred, he was given an electrical stimulus through an electrode connected to the forearm from a transformer. When the masculine thought occured, no shock was applied.

Immediately following, he was shown a set of "seductive, nude, female coloured pictures' and the same electrical aversive conditioning was conducted. He attended five daily 30-minute outpatient sessions and approximately 60-80 shocks were administered during each session. The shocks were given until he was no more able even to imagine the transvestite thought on forced thinking.

At one stage, he became hostile and resentful of the aversive therapy and commented that "even a man can get used to and be numb to torture". Despite electrical aversion, his transvestite thought became stronger and one realised that his masochistic tendencies were counteracting the aversive stimulus. However while at home, these urges subsided and he attributed this to his being able to "bear his soul and speak intimately" to someone who understood him. He was becoming rather depressed by electrical aversive therapy.

(3) Aversive Therapy by Photographs of the Patient

By the sixth session, it was decided to abandon electrical aversion and utilise "shame

and guilt" as an aversive stimulus. After much persuasion, he agreed to be photographed, with a polariod camera, in female clothes as well as in male clothes. In the subsequent five sessions, these photographs were used as an aversive stimuli.

He would be made to handle the female garments, fantasise over the nude pictures and associate freely and aloud. When the transvestite thought occurred, he was immediately shown his photograph in female clothes. When the masculine thought occurred, the "female" photographs were removed and replaced by the "male" photograph.

His reactions were immediate and disgusting, — "not nice, unnatural, disgusted, ashamed. It's not me there, somebody else. Throw it away, push it away. I feel very uneasy, disgusted and want to destroy them".

To the male photographs — "It's nice, gentlemanly. I like to look like a man".

In the course of therapy, the transvestite thought receded and the masculine thought became more obvious and desirable. This was reinforced by encouragement and praise (social reinforcement).

He kept thinking of the photographs whenever the transvestite thought occurred at home. Ultimately the handling of female garments caused him to think of the photographs in disgust (even without the production of the photograph). He could no more bear even the thought of wearing female clothes. He was advised to think of the photographs whenever the transvestite thought occurred at any time.

As he became symptom-free, the sessions were spaced out fortnightly and then monthly. He felt happier, less confused, his concentration returned and psychosomatic symptoms receded. He started making plans of acquiring a girl friend by attending adult education classes in the evenings, and the sight of pretty girls stirred up masculine thoughts within him.

(4) Supportive Psychotherapy

Throughout the process of aversive conditioning, a warm inter-personal relationship was formed between the patient and the therapist. He was allowed to ventilate his guilt feelings of his perversion and supportive therapy was carried out concomitantly. No attempt was made to interpret or give a reason for his sexual deviation, although he obtained a strong gratification from his matured and realistic relationship.

Discussion

There is much overlap between behaviour therapy and psychotherapy, especially in the region of patient-therapist interpersonal relationship. Gelder (1965) emphasised that psychotherapy and behaviour therapy were not mutually exclusive.

No doubt the patient formed a warm interpersonal relationship with the therapist, and at one stage of electrical aversion, commented that he could speak to someone of his problem which he could never confide in anyone else. It was my impression that punishment by electrical aversion produced only a temporary remission of his symptoms, and was not suitable for him in view of his masochism. The therapist acted as a strong positive social reinforcer, and at each stage of improvement the more open therapist-patient relationship provided further stimulus for improvement. Besides the remission of guilty symptoms, psychosomatic symptoms and the reduction of sexual identity confusion stirred him to keeping well.

Gelder (1964) and others stressed that those who wish to use the learning theory to treat patients must not ignore these relationship between the patient and the therapist. The two ideas are not incompatible. So far in the field of literature reviewed, no case of transvestism has been treated by aversive reconditioning utilising the photographs of the patient as an aversive stimuli. This case was successfully treated by a modification of the classical techniques of faradic electrical aversion.

Summary and Conclusion

(1) The definition of aetiological theories of transvestism were discussed.

(2) The clinical manifestations of transvestism ranged from mild to severe and were often associated with other forms of sexual deviation.

(3) Although psychotherapy has been advocated for its treatment, encouraging results were in the field of behaviour therapy. Earlier works conclude that electrical aversion was superior to chemically induced aversion.

(4) A case of transvestism was successfully treated utilising the patient's transvestite photographs as an aversive stimulus, after electrical aversive therapy failed. This modification of the aversive stimulus has not been previously reported in the literature reviewed.

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Bibliography

1. Baradhal, H.S., (1953) "Female Transvestism and Homosexuality". *Psychiat. Quart., 27:* 390-438.
2. Barker, J.C. et al, (1961) "Behaviour Therapy in a Case of Transvestism". *Lancet, 1:* 51.
3. Barker, J.C., (1963) "Aversion Therapy of Sexual Perversion". *Brit. J. Psychiat., 109:* 696.
4. Barker, J.C., (1965) "Behaviour Therapy for Transvestism: A Comparison of Pharmacological and Electrical Aversion Techniques". *Brit. J. Psychiat., 111:* 263-276.
5. Barr, M.L. & Hobbs, G.N., (1959) "Chromosome Sex in Transvestites". Lancet, *1:* 1109-1110.
6. Bender, L. & Paster. S., (1941) "Homosexual Trends in Children". *Am. J. Orthopsychiat., 11:* 730-743.
7. Ellis, H., (1927) "Erotic Symbolism", in *"Studies in the Psychology of Sex"*. Philadelphia; F.A. Davis & Co.
8. Ellis, H., (1927) "Eonism and other Studies", In *Studies in the Psychology of Sex."* Vol. 7, Philadelphia; F.A. Davis & Co.
9. Fenichel, O., (1930) "The Psychology of Transvestism". *Int. J. Psychoanalysis, 11:* 211-227.
10. Fenichel, O., (1945) *"The Psychoanalytic Theory of Neurosis"*. New York; W.W. Norton & Co.
11. Freud, S., (1910) *"Three Contributions of the Theory of Sex"*. New York; Nerv. & Ment. Dis. Pub. Co.
12. Gelder, M.G., (1964) "Behaviour Therapy and Psychotherapy for Phobic Disorders". Paper Read at 6th Intern. Cong. of Psychotherap. London.
13. Gelder, M.G., (1965) "Assessment of Behaviour Therapy". *Proceed. Roy. Soc. Med., 58;* 525-529.
14. Glynn, J.D. & Harper, P., (1961) "Behaviour Therapy and Transvestism". *Lancet, 1:* 619-620.
15. Greenacre, P., (1953) "Certain Relationships between Fetishism and the Faulty Development of the Body Image". *Psychoanaly. Stud. of the Child, 8:* 79-98.
16. Gutheil, E., (1954) "The Psychologic Background of Transvestism and Transexualism". *Amer. J. Psychotherp., 8:* 231-239.
17. Kinsey, A.C., (1953) *"Sexual Behaviour of the Human Female"*. Philadelphia; Saunders.
18. von Krafft-Ebing, R., (1947) *"Psychopathia Sexualis"*. New York: Pioneer Pub.
19. Laikos, A., (1967) "Familial Transvestism". *Brit. J. Psychiat.*, 113; 49-51.
20. Lukianowiez, N., (1959) "A survey of Various Aspects of Transvestism in the Light of our Present Knowledge". *J. Nerv. Ment. Dis., 128:* 36-64.
21. Marks, I.M. & Gelder, M.G., (1967) "Transvestism and Fetishism: Clinical and Psychological Change during Faradic Aversion". *Brit. J. Psychiat., 113:* 711-729.
22. Meyer, V. & Crisp, A.H., (1966) "Some Problems in Behaviour Therapy". *Brit. J. Psychiat. 112:* 367-381.
23. Olkon, D., & Sherman, I., (1944) "Eonism and Outstanding Psychopathic Features". *J. Nerv. Mental Dis.*, 99: 159.
24. Ostow, M., (1953) "Transvestism". *J. Am. Med. Ass., 152:* 1153.
25. Peabody, G.A., Rowe, A.T. & Wall, J.H., (1953) "Fetishism and Transvestism". *J. Nerv. Ment. Dis.*, 118: 839-950.
26. Prince, C.V., (1965) "Survey of 390 cases of Transvestism". Read before the Western Div. Meeting of the Am. Psych. Assoc. Honolulu.
27. Rachman, S., (1961) "Sexual Disorders in Behaviour Therapy". *Am. J. Psychiat. 118:* 235-240.
28. Stoller, R.S., (1967) "Transvestites' Women". *Amer. J. Psychiat., 3:* 333-339.
29. Stoller, R.S., (1971) "The Term Transvestism". *Archiv. Gen. Psychiat., 24:* 230-237.

Total dose infusion of Imferon in Obstetrics

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ANAEMIA IS A common problem in antenatal patients. Some very severely anaemic patients are seen in this country. Kwa and Ko (1968) found 33 per cent of patients in Singapore to have a haemoglobin level of less than 10.0 gm./100 ml. at booking. Many patients book late and some not at all. Hence there is a special problem in that many women do not give their obstetricians time to correct their anaemia. In this region, observations show that many of the anaemia in pregnancy are due to iron deficiency, some due to folate deficiency and some combined deficiency.

Iron therapy is a problem amongst Malaysian women; unfortunately, those who needed it most are the greatest defaulters. For the slightest constipation, loose stool or nausea, the women will flout the advice of the doctors. The alternatives to oral iron therapy, iron given intermittently by intramuscular or intravenous routes, are not very convenient. Some patients find it difficult to attend every other day for injections because of other children in the house or other domestic chores. Other women find that the bus-fare to and from the hospital drains off her day's marketing allowance.

Hence the anaemic obstetric patient in Malaysia presents one of the best indications for total dose infusion of imferon (iron-dextran) as advocated by Basu (1963). Many have low haemoglobin; many are late in pregnancy before this is detected; for socio-economic reasons, many are either unsuitable or un-co-operative for oral or other forms of parenteral iron therapy.

Since the opening of the Maternity Unit of the University Hospital, total dose infusion of imferon was carried out as a prospective study. In spite of this some data are inadequate because new doctors joined the unit and used this method of therapy before having been fully briefed.

Material and Methods

When this series was carried out, all patients with a haemoglobin level of 11.1 gms./100 ml. in the antenatal clinics were referred to the Anaemia Clinic. Here they were seen by the author in conjunction with a haemotologist. Full investigations were carried out and patients for TDI were selected.

The basis for selection of patients are as follows:

(1) The period of gestation is an important factor. Whenever there is time for an alternative means of giving iron, this is always preferred.

Unless otherwise indicated, no TDI is given to patients until they are 37 weeks pregnant.

(2) The haemoglobin level is another factor; unless indicated by lack of time or failed therapy by other methods, TDI is not given to patients with a haemoglobin level above 8.5 gms./100 ml..

(3) Iron deficiency state is established prior to TDI. At first, a serum iron is a prerequisite to TDI. Later, it was found that in many patients it was not justified to wait for serum iron results.

Hence, later in the trial many patients are given TDI on the evidence of iron deficiency from their peripheral blood picture alone.

(4) Failure of oral or other forms of parenteral iron therapy. This may be because the patient does not attend the antenatal clinic or does not take the tablets or there is no clinical response (perhaps due to malabsorption syndrome). In this group are included postnatal patients who are unlikely to return for their check-up and therapy as they failed to book antenatally. Many of those with higher levels of haemoglobin belong to this group.

Once selected, a patient was given an appointment to receive the TDI's as an outpatient procedure. However, many turned up late because of various reasons, like too much work to settle in the house or missing the bus. Those whose TDI were not completed by 1800 hours were kept overnight.

On admission, the following observations were recorded: maternal pulse rate, blood pressure and respiration rate. A check was carried out to make sure that none with an allergic history (e.g. asthma) had been inadvertently put on trial. The foetal heart rate was recorded.

The dose of imferon required is calculated according to the following formula: $\frac{W.D. \times 13}{1,000} + 10 =$ ml. of imferon required, where w= weight of patient in kgm. and D = haemoglobin deficiency in percentage. It will be found that this is, in fact, the formula supplied by manufacturer. Some mathematical juggling has been carried out for easy calculation.

The dose required is then diluted. Unless hypertension, pre-eclampsia or other conditions contraindicate, normal saline is the diluent of choice. Five per cent dextrose is used for the others. The maximum concentration used is 25 ml. diluent. It is noted that 36 (10 per cent) of the patients are given TDI in excess of recommended 5 per cent V/V concentration.

Half-way through the trial, because of a spate of unexplained reactions, it was decided to give the patient phenergan (promethazine hydrochloride 25 mg.). This was either given intramuscularly 30 minutes before the TDI was started, or was put into the drip. This also served as a study to find out if the giving of an antihistamine would reduce the reactions.

The drip was set after blood samples for a full count were taken. It was run at 10 drops per minutes for 30 minutes. During this half hour, close observation was carried out. The resuscitation tray was kept in readiness (this contains adrenaline, hydrocortisone and aramine injections). If no reaction was seen, the drip rate was increased until 50 drops per minute was attained. The rest of the drip was then run under observation.

Patients were also given folic acid. Usually 5 mg. thrice a day was the dose. In some, a loading dose of 15 mg. intramuscularly was given on the first two days.

All being well, the patient was allowed to go home. She was seen in a week's time at the clinic. Blood samples were sent for investigations to follow the progress of the therapy. Folic acid therapy was continued but these patients were given no more iron therapy of any form.

Table I shows the racial distribution of patients who total 359. The respective population of Selangor state is shown for comparison:—

TABLE I

Racial Distribution Of Patients & Population In Selangor State.

Race	No. of Patients	Percentage	Pop: of Sel	Percentage
MALAYS	83	23.1	88,960	32.2
CHINESE	124	34.5	135,280	49.4
INDIANS	150	41.8	51.540	18.4
OTHER	2	0.6	—	—

The patients are all between the ages of 16-45 years. There were 82 women having their first pregnancy. The majority (74.0 per cent) were patients who have had less than four children. The details are shown in Fig. I.

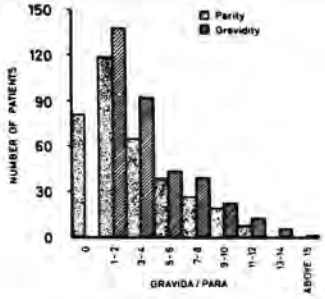
Fig. 2 shows the maturity of the pregnancies when the patients presented for booking and when TDI was given. Only 119 (33.7 per cent) of the 359 patients booked before the 30th week of gestation. It is also seen that 38 patients were given TDI before the 30th week of pregnancy.

The socio-economic status of patients is rather difficult to assess. As far as could be ascertained, the total family income of the patients is shown in table II.

TABLE II

Socio-Economic Status Of 359 Patients.

Monthly Income	Number of Patients
ABOVE M $600	8 (2.2%)
M $400 — M $600	30 (8.4%)
M $201 — M $400	90 (25.1%)
BELOW M $200	225 (62.7%)
UNKNOWN	6



GRAVIDITY & PARITY IN RELATION TO NUMBER OF PATIENTS GIVEN IMFERON DRIP

Fig. 1

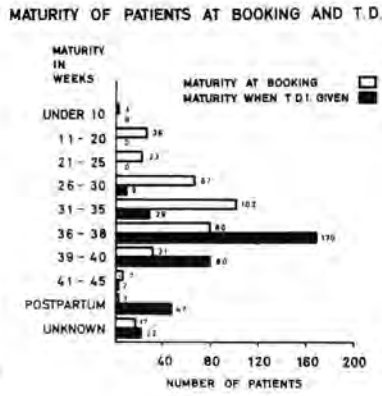


Fig. 2

Table III shows the concentration and the total amount of imferon given. The figures given are in millilitres of imferon. (Multiply by 50 to get the same in milligrams of imferon.)

TABLE III

Concentration & Total Imferon Given To Patients.

Imferon Volume (ml.)	Number of Patients: Maximum Imferon/500 ml.	Number of Patients: Total Imferon
Under 10	2	8
11 — 15	15	8
16 — 20	174	9
21 — 25	129	55
26 — 30	23	36
31 — 35	8	69
36 — 40	2	97
41 — 45	1	40
46 — 50	—	28
51 — 56	2	2
56 — 60	—	5
Unknown	3	2

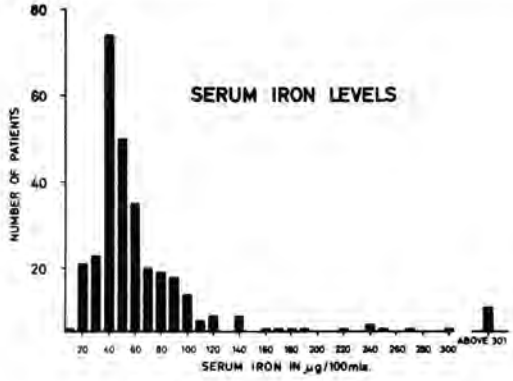


Fig. 3

As stated, 36 (10 per cent) patients were given imferon in greater concentration than the recommended 5 per cent V/V. These were all given by new members of the staff and unintentional. The majority (206 patients) received between 31-45 ml. (1550-2250 mg.) of imferon each. These were all given in the same day.

The diluents used for the infusion are shown :—

Normal Saline	224
5% dextrose	94
Unknown	41
Total	359

Of 359 patients, 43 (12 per cent) required blood transfusion either during labour or after the delivery.

Of these, six patients required three or more units of blood.

Stool Examinations

Specimens were sent from 260 patients. The results are shown in Table IV.

TABLE IV

Result Of Stool Examination.

Result	No. of Population
Not Done	99
Negative	85
Ascariasis	26
Mixed Infections	77
Ankylostomiasis	43
Others (e.g. Trichuriasis)	29
Total	359

It is seen from the table that 146 (56.2 per cent) patients required therapy for worm infestation.

Haematology

Serum Iron

The serum iron levels are shown in Fig. 3. It is seen that of 284 patients who had serum iron assayed, 243 (85.6 per cent) patients have serum iron level below 80 mg./100 ml. In this laboratory, any reading below this level is considered to be a deficiency state. Those patients who had abnormally high serum iron level probably had taken iron therapy from other sources without informing us.

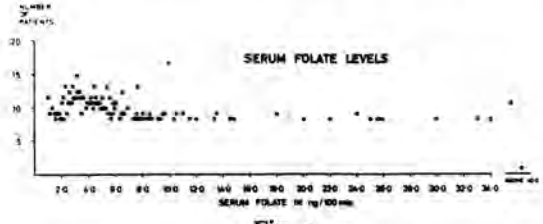


Fig. 4

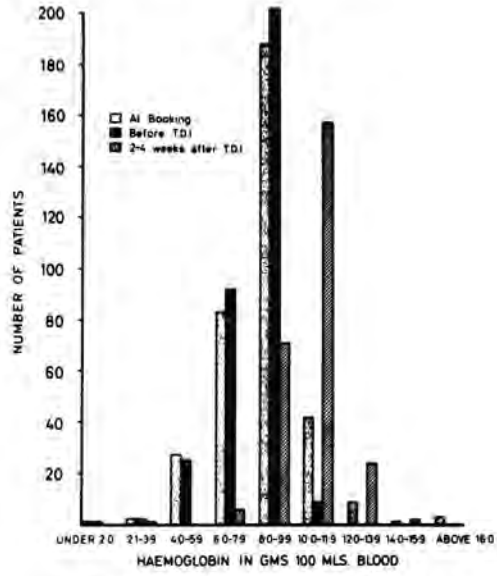
Serum Folate

The scattergram in Fig. 4 shows the serum folate levels. In this laboratory, any reading below 6.0 mg./100 ml. is taken to be deficient. It is seen that a total of 183 (68.3 per cent) patients, of the 268 who had serum assays done, showed a deficiency state. Again the extremely high level may be due to folate therapy unknown to us.

Result

Haemoglobin:

Fig. 5 shows the haemoglobin distribution of 359 patients at booking, before and after TDI was given. The haemoglobin after delivery has not been taken into consideration as this is influenced by postpartum blood, less blood transfusions.



HAEMOGLOBIN DISTRIBUTION AT BOOKING, BEFORE & AFTER IMFERON DRIP

Fig. 5

It is seen that the haemoglobin distribution at booking has an even scatter with a peak at the 8.0-9.9 gm./100 ml. group. The distribution before TDI is almost totally below 8.0-9.9 gm/100 ml. group. At 2-4 weeks after the imferon drip, the peak of the distribution has moved to the right to the 10.0-11.9 gm./100 ml. group. The average rise of haemoglobin in the first four weeks was 1.4 gm./100 ml. per week.

PCV & MCHC

The pack cell volume (PCV) and the mean corpuscular haemoglobin concentration (MCHC) before and after TDI are shown in Fig. 6. It is seen that there is a definite shift to the right after TDI in the result of the PCV. A similar but less pronounced trend is shown in the MCHC results.

Peripheral Blood Film

The peripheral blood pictures were studied in 317 of the 359 patients. The results are as shown in table V:

TABLE V

Peripheral Blood Film Of 317 Patients.

Result of PBF.	No. of Patients
Not Done	42
Microcytic	50
Hypochromic	49
Macrocytic	38
Mixed	17
Poikylocytic	3
Anisocytic	6
	359

Causes of Anaemia

After all the factors have been considered, the causes of anaemia in these patients are computed. The results are shown in table VI.

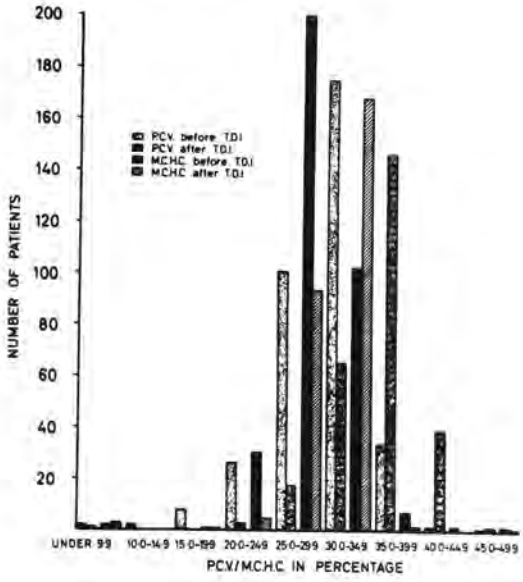
TABLE VI

Diagnoses Of Anaemia In 359 Patients.

Causes of Anaemia	No. of Patients
No Definite Diagnosis	27
Iron Deficiency	80
Folate Deficiency	12
Iron-Folate Deficiency	238
Others	2
Total	359

It is seen that the majority of patients show a combined deficiency. These diagnoses are mainly computed from the results of the serum assays, peripheral blood morphology and from the PCV and the MCHC. Unfortunately, the planned study on blood marrow had to be abandoned as the majority of the patients refused this procedure. If this had been done, perhaps a diagnosis will be made for the 27 patients under "no definite diagnosis". The two patients under "others" were cases of sickle cell traits and thalassaemia.

Some of the patients, of course, had concommitant infections (urinary tract, septic foci, etc.....). These were treated accordingly.



P.C.V. & M.C.H.C. BEFORE & AFTER IMFERON DRIP

Fig. 6

Outcome of Pregnancy

TABLE VII

Outcome Of Pregnancies.

	No. of Patients
Live Birth	346
Fresh S.B.	4
Macerated S.B. (+IUD)	4
Neonatal Deaths	5
Total	359

There were eight stillbirths (2.2 per cent) and five neonatal deaths (1.4 per cent). In none of these is there any relationship between the TDI and the fetal loss.

Reactions

The details of these are reported in another publication by the author. Only a summary will be given here.

The reactions recorded are all mild. No fatal anaphylactic reaction was observed. The most severe reaction was seen in a woman who had been on oral iron for a month and was receiving a TDI of 20 ml. imferon in 500 mls. of five per cent dextrose.

She had a fall in blood pressure, tachycardia and was sweating. Stopping the drip and an intramuscular injection of hydrocortisone stopped the reaction.

Other reactions are listed in table VIII. One patient usually has one or two of the symptoms listed.

TABLE VIII

Reactions Of TDI.

Reactions	No. of Patients
Immediate	
Giddiness	6
Coldness	1
Chest pain	8
Constriction	
Sweating	1
Knee-joint pain	1
Hypotension	2
Delayed	
Thrombophlebitis	3
Skin rash	1

The rate of reactions is 2.5 per cent but it must be explained that only a total of nine patients had reactions. All of these were mild reactions. Of these, all responded immediately to routine management which consists of either or a combination of the following :—

(1) stopping the TDI, (2) giving promethazine hydrochloride and/or hydrocortisone intramuscularly.

In most patients, this therapy is started as a prophylaxis. No permanent effects have been observed.

Discussion

The results of this prospective study are in line with those of Varde (1964) and Basu (1965). A rapid rise in the haemoglobin level is noted following TDI. This rise was optimal when the initial haemoglobin level was lowest. (See Fig. 7). Kwa (1966) and Pathak et al (1967) also found the response to TDI to be greater in the group of patients who had lower haemoglobin levels before therapy. A prolonged follow-up carried out in a small proportion of patients showed a gradual secondary rise in the haemoglobin level. (See Fig. 8). This has also been shown by Kwa (1966), who stated that there is a very rapid rise in the haemoglobin level which is most marked in the first two weeks, after which there is a more gradual rise until the haemoglobin reaches normal levels between the 4th to 8th weeks.

The average rise of haemoglobin in the first four weeks was 1.4 gm./100 ml. per week. At the end of the fourth week, only 78 patients had haemoglobin levels between 8.0-9.9 gm./100 ml. (See

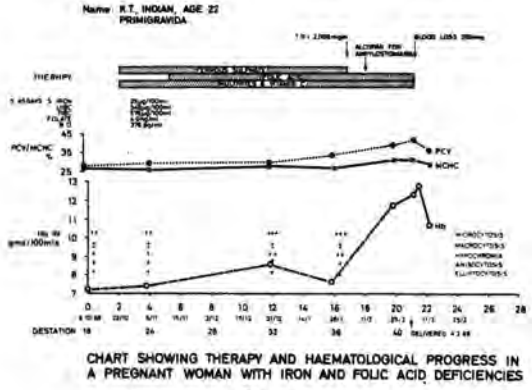


CHART SHOWING THERAPY AND HAEMATOLOGICAL PROGRESS IN A PREGNANT WOMAN WITH IRON AND FOLIC ACID DEFICIENCIES

Fig. 7

Fig. 5). It must be noted the 120 patients had haemoglobin levels below 7.9 gms./100 ml. before TDI was given. Not all the 78 patients can be classified as poor response. Hence, the patient with an original haemoglobin of below 2 gms./100 ml. had reading of 3.7 gms./100 ml. two weeks after the TDI. Therefore she was transfused as she went into labour. It is believed that the giving of massive doses of iron often unmasks or induces folate deficiency as has been shown by Scott (1963), Basu (1965) and Garland (1964).

Hence in the management of this series of patients, folic acid was given as a routine. Chanarin et al (1965) observed that iron deficiency may mask the morphological criteria of a megaloblastic anaemia and iron deficiency in itself produced an additional stress on folate metabolism. In this series, there was evidence of a combined iron-folate deficiency in 236 (66.3 per cent) patients.

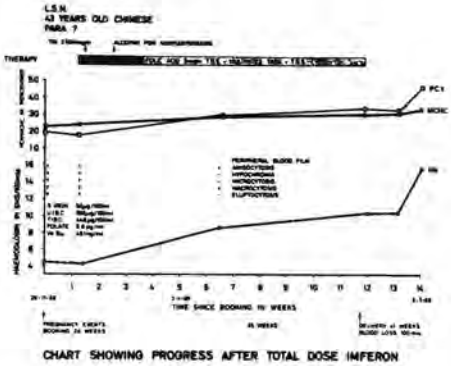


CHART SHOWING PROGRESS AFTER TOTAL DOSE IMFERON

Fig. 8

After the TDI, no further iron therapy was given. Perhaps in those with a poor response, the serum iron should have been repeated and further iron therapy given. Kwa (1966) found that after TDI, a number of patients continued to show low serum iron levels, even amongst those showing good response.

Examination of the stools for ova showed that 56.2 per cent of patients required therapy for worm infestation. The majority of these were ankylostomiasis which would certainly contribute towards the anaemia. In this country, it is very important to include investigations and therapy for helminthiasis in the management of anaemic patients.

In 359 TDI infusions, only one patient demonstrated a mild anaphylactic type of reaction. Anaphylactic reactions have been reported by other authors. Like most reactions to TDI, they occur immediately following commencement of the therapy. A reaction rate of 2.5 per cent is recorded. While this is high compared with Lane and Scott's (1965) reported reaction rate of 0.28 per cent in 1,807 fully documented cases, it has to be pointed out that all the reactions were mild. Clay et al (1965) observed 13 (8.7 per cent) reactions out of 150 patients, seven of them severe. No other worker has so far reported similar results. A review by Mills (quoted by Manton 1966) gives the overall incidence of severe reactions based on 2,898 reported cases, as less than 0.28 per cent if the results of Clay et al (1965) are excluded, or 0.50 per cent, if these are included. Perhaps close observation and prompt prophylactic treatment of mild reactions do avert more severe reactions.

The perinatal loss is 36 per thousand. Unfortunately, the autopsy rate here is negligible. Clinically, there does not appear to be any reason to believe that any of these foetal loss was due to the TDI. The overall perinatal mortality rate for the same period in this hospital is 33.1 per thousand. Pathak et al (1967) submitted the three stillbirths in their series to thorough autopsies. A detailed search failed to reveal increased iron deposits in the various viscera. Further, there was no iron staining in the placentae of these patients.

The use of iron-dextran in a total dose infusion therapy has the following advantages:

(1) TDI raises the haemoglobin rapidly and is safe. Varde (1964) and Martin et al (1965) have commented on the low toxicity, high stability and freedom from ionic iron of this compound. For the anaemic patient in the last weeks of pregnancy, it offers a rapid way to raise the haemoglobin. This, besides making delivery safer, reduces the need for blood tranfusion.

(2) TDI reduces the need for blood transfusion. Blood tranfusion is costly, difficult to come by and carries inherent danger. The reduction in the use of blood tranfusion has been shown by Lane (1964), Varde (1965) and Kwa (1966).

(3) In TDI, the dose is individually calculated not only to raise the haemoglobin level but also to replenish the body stores of iron. It is important to remember that when peripheral blood shows evidence of hypochromic anaemia, the body iron stores are virtually exhausted (De Gruchy 1964) and that satisfactory treatment requires replacement of the total body deficit.

(4) TDI does away with problems posed by patients who are unable and/or unwilling to accept oral or repeated parenteral iron therapy. Furthermore, the rise in haemoglobin is more brisk in the group treated with imferon — 2.2 gm./100 ml. per week during the first two weeks compared with 1.3 gm./100 ml. per week in the group given ferrous sulphate. (Patel and Tulloch 1967).

(5) Following TDI, there is not much excretion of iron as shown by Will and Groden (1968). Using a radioistope, ^{59}Fe labelled preparation of iron-dextran given intravenously to patients, they found no significant radioactivity in their urine and faecal collections

(6) From the patient's point of view, it saves a lot of time and repeated (sometimes long and tedious) journeys to crowded outpatient's clinics. This is important in this country, especially in the rural areas.

(7) From the point of view of the hospital, precious time of medical staff is saved. There is no need to run weekly clinics to give patients parenteral iron.

Acknowledgement

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References

Basu, S.K. (1963): Rapid Administration of iron-dextran in late pregnancy. *Lancet* I 1430.

Basu, D.K. (1965): Administration of iron-dextran complex by continuous intravenous infusion. *J. Obstet. Gynaec. Brit. Cwlth.* 72 2539.

Chanarin, I, MacGibbon B.W., O'Sullivan W.J. & Mollin

D.L. (1959). Folic acid dificiency in Pregnancy. *Lancet* II 634.

Clay, B., Rosenberg B., Sampson N., Samuels S.I. (1965): Reactions to total dose intravenous infusion of iron dextran. *Brit. Med. J. I,* 29-31.

De Gruchy, G.C. (1964): Clinical Haematology in Medical Practice 2nd Edn. Blackwell Scientific Publications Oxford.

Gartland, G.J. (1964): Parenteral Iron in Pregnancy. *Brit. Med. J. I,* 435.

Kuah, K.B. (1971): In Preparation.

Kwa, S.B. (1966): Iron deficiency anaemia treated by total dose infusion of iron dextran complex. *Singapore Med. J., 7,* 105.

Kwa, S.B., & Ko M., (1968): Haemoglobin values in Pregnancy — A Survey of 1,000 consecutive normal mothers. *Singapore Med. J., 9,* 27.

Lane, R.S. (1964): Intravenous infusion of iron-dextran complex for iron-deficiency anaemia. *Lancet T,* 852.

Lane, R.S., Scott, J.M. (1965): Reactions to intravenous iron dextran. *Brit. Med. J., T,* 449.

Martin, L.E., Bates, C.M., Beresford, C.R., Donaldson, J.D., McDonald, F.F., Dunlop, D., Sherard, P., London, E., & Twigg, G.D. (1955): The pharmacology of iron, dextran intramuscular haematinic. *Brit. J. Pharmacol., 10,* 375.

Mills, P. (1965): Personal Communication quoted by Mansow, I.W. (1966) *Med. J. Aust. I,* 174.

Petel, K.M. & Tulloch, J.A. (1967): Total dose inferom (iron-dextran complex) infusion therapy in severe hookworm anaemia. *Brit. Med. J. II,* 605.

Pathak, U.N., Wood, J.K. & Sorhaiddo, B.A., (1967): Anaemia of pregnancy treated with simple intravenous dose of iron-dextran. *Obstet & Gynec, 29,* 500.

Scott, J.M. (1963): Iron-Sorbitol-Citrate in Pregnancy Anaemia. *Brit. Med. J. II,* 354.

Varde, K.N. (1964): Treatment of 300 cases of iron deficiency of pregnancy by total dose infusion of iron dextran complex. *J. Obstet. & Gynaec. Brit. Cwlth. 71,* 919.

Will, G. & Groden, B.M. (1968): The treatment of iron deficiency anaemia by iron-dextran infusion. A Radioisotope Study. *Brit. J. Haemat. 14,* 61.

Primary Tuberculosis of the Nasopharynx

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Introduction

DESPITE THE VIGOROUS anti-tuberculosis campaign by the National Tuberculosis Centre with modern diagnostic procedure and chemotherapy, there still exists a large number of patients with active tuberculosis in Malaysia. It is estimated that there are approximately 14,000,000 active cases in the world (Chodosh et Willis 1970). While tuberculosis involves the whole system in the body, primary nasopharyngeal involvement is very rare. Hence this is a case study of a Malay patient presenting with primary tuberculosis of this region.

Case Report

History

Mohd. S. bin Md. Abdullah, a 38-year-old Malay male, works as a machine-switch operator. He was first seen in February, 1970 with a history of frequent sore throat and post-nasal discomfort for over five years. There were episodes of exacerbation and partial remissions of symptoms. Associated with this, he had stuffiness of nose with muco-purulent post-nasal discharge and irritative non-productive cough. For the six months prior to date of visit to the hospital, the symptoms became persistent. He saw many doctors and was given treatment with little relief. There was no history of loss of weight, hoarseness of voice, evening fever, night sweats or loss of appetite.

Physical Examination

He was a well-built, healthy individual, active and alert, weighing 58 kgm. His general condition was satisfactory. The positive findings were confined to the following:—

Nose — Vestibule normal. No nasal discharge, septum central, nasal mucosa, hyperaemic and odematous but no hypertrophy or ulceration of the mucosal surface. Nasal airway patent but reduced.

Pharynx — The tonsils were scarred and atrophic but no active lesion was seen clinically. The posterior oro-pharyngeal wall appeared red, granular, and covered with muco-pus. The pharyngeal mucosa showed areas of hypertrophy with ulceration.

The nasopharynx showed similar changes. The vello-pharyngeal space was reduced in size by the odematous and hypertrophied mucosa which extended to the roof and lateral pharyngeal walls, including the Fossa of Rosenmuller. The surface was red, infected, granular and showed areas of ulceration. The hyopharynx was odematous with pooling of saliva in the pyriform fossa.

Larynx — The mucosa of the supra-glottic region of the larynx was normal but odematous. The vocal cords were normal.

Neck — The jugulo-digastric nodes on both sides were enlarged and non-tender.

Investigations

1. *Blood*

Total white count	13,800 ul	
Differential count	Neutrophil	65%
	Eosinophils	8%
	Lymphocytes	27%
Erythrocyte Sedematation Rate	75mm/hour	
Kahns Test	Negative	

2. *X-rays*

Chest	Heart and lungs—normal
Paranasal Sinuses	appear clear
Nasopharynx (Fig. 1)	There is minimal degree

of thickening of the pre-cervical soft tissue in the upper cervical region. The thickness of the posterior wall of the nasopharynx measures 5 mm. which is in the upper limits of normal. The surface appears irregular which is of significance.

Impression

Nasopharyngeal tuberculosis or nasopharyngeal cancer of the infiltrative type could give this appearance (Dr. Soo — radiologist).

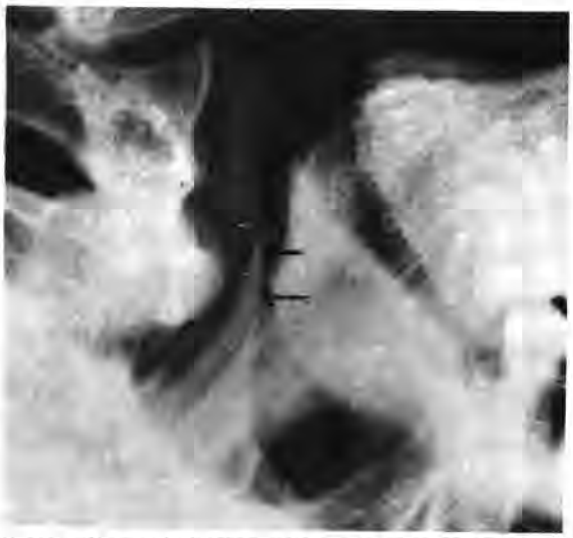

Fig. 1: Shows thickening of the nasopharyngeal mucosa with irregular surface (arrowed).

3. *Bacteriological Examination*: Smear and Culture of sputum, nasal discharge, nasopharyngeal swab and gastric lavage for Acid Fast Bascilli were all negative.

4. *Mantaux Test*: Intradermal injection of 1 Tuberculin unit was strongly positive — 20 mm.

5. *Histopathology.*

Biopsy. From posterior nasopharyngeal wall shows surface lined by normal nasopharyngeal epithelium, the stroma is collagenous with numerous mono-nuclear cells especially lymphocytes, with Langhans type of giant cells together with granulomata formation. Caseation is minimal. There is no evidence of malignancy. Lesions consistent with tuberculosis. (Fig. 2).

Biopsy. From Mucosa of Nasal septum and Inferior Turbinate shows non-specific inflammation. No evidence of tuberculous granulation.

Diagnosis

Primary Nasopharyngeal Tuberculosis.

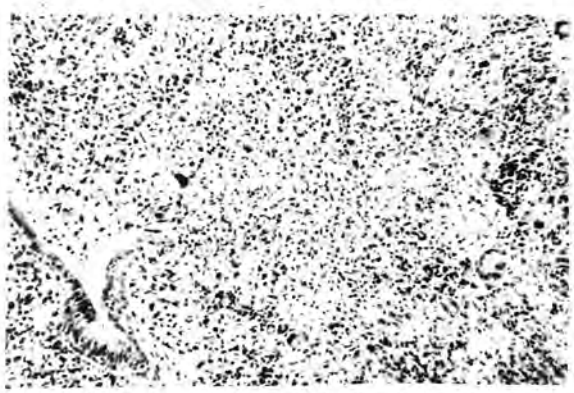

Fig. 2: Shows numerous epitheloid and Langhans type giant cells at the periphery of a tubercle. A fragment of respiratory epithelium is seen on the left of the picture (x 230).

Treatment

The following antituberculosus treatment was instituted on 20.3.70.

Inj. Streptomycin 1 gm. thrice-weekly for 3 months.

Tab. Isobenzacyl iii four times/day (to be continued for 18-24 months).

Follow-up

Since institution of specific treatment, the patient

has made rapid recovery. Within the first 3 months, there was marked improvement. The mucopurulent discharge cleared, the mucosa was smooth, non-granular, non-hyperaemic and free of edema. The vello-pharyngeal space was more reduced than when first seen but there was no functional impairment.

Discussion

Judging from the world literature (Wille 1948; Savic et other 1961, Akaike 1964, Saito 1964, Martinson 1967) isolated tuberculosis of the nasopharynx is very rare. In the past two decades, with improved chemotherapy, and high standard of living in Malaya, one does not suspect such lesions in the upper respiratory tract. Diagnosis is often delayed.

Site of Lesion

On the whole, tuberculosis of the upper respiratory tract is rare. When it does occur, it is often secondary to active pulmonary tuberculosis. The larynx and hypopharynx are common sites. A less common site of origin is the nasal septum near the muco-cutaneous junction. The least common site is the nasopharynx (Martinson 1967). A review of world literature by Sevic et others (1961) could only find four cases in a period of ten years. This is surprising in view of the occasional finding of tuberculous foci in adenoid tissue of patients who have no clinical infection. Usually in tuberculous infection involving the upper respiratory epithelium, the normal secretory mucosa is destroyed and is replaced by non-secretory type leading to crusting and drying (Martinson 1967). In this patient, although the lesion has been present for over 4 years, there was no crusting of the nasal mucosa or helitosis. This lends strong evidence to the assumption that the lesion was solely, if not primarily in the nasopharynx and not nasal cavity. Other evidences to indicate this primary site are:—

1. Negative smear and culture for acid fast bacillus from sputum, nasal discharge and gastric lavage.
2. Non-involvement either clinically or radiologically of the larynx and lung parenchyma.
3. Negative histopathological finding from the nasal septum and inferior turbinate.

Aetiology

In the absence of evidence pointing to other primary sites in the patient, it is possible that the adenoid may have harboured the tuberculous bacilli for some time and for an unknown factor, precipitated the clinical disease. The enlarged jugular diagastric lymph nodes must have been secondarily involved. On the other hand, the organism could have gained direct entry through a break in the mucosa. A third possibility that it might have been blood-borne, from undetected focus elsewhere cannot be ruled out.

Diagnosis

The early diagnosis of tuberculosis of this region is apt to be missed if one does not keep this in mind. The frequent occurrence of nasopharyngeal carcinoma in adults in this part of the world invariably makes one to think of this as the main clinical diagnosis. However, the fact that the lesion has been present for 4-5 years and that he is a Malay in whose ethnic group in my experience, nasopharyngeal carcinoma is rare made me suspect other possible causes like tuberculosis, midline granuloma, Wegner's granuloma, Boeck's Sarcoid, leprosy and fungal diseases caused by aetinomycosis, blastomycosis and coccidiomycosis. Although the diagnosis in this patient was not bacteriologically confirmed, yet the histopathological features (Fig. 2), the radiological finding (Fig. 1) and, most important, the satisfactory therapeutic response over the past year was conclusive proof.

Prognosis

With modern chemotherapy, the prognosis of tuberculous infection is excellent. Within three months of commencement of treatment, this patient felt almost complete symptomatic relief. After treatment for a year, the mucosa had clinically reverted to near normal except for reduction of the vello-pharyngeal space. This could be a sequel to normal healing by fibrosis, although Chodosh and Willis (1970) state that scarring of this region is minimal except in the Lupus form of the disease.

Summary

A case of primary tuberculosis of the nasopharynx is reported. The disease, from available statistics, is very rare. With the prevalence of nasopharyngeal carcinoma in Malaysia one tends to think of this as the first diagnosis. The diagnosis was made histopathologically and the response to antituberculous therapy was very satisfactory. In the absence of other primary sites, the follow-up and assessment of progress in this patient was made solely by the ENT surgeon. Although he had made good recovery in a short time, yet he would have to have a full two-year antituberculous treatment. This fact must be stressed to the patient to ensure complete cure.

References

Akaike, K. et al 1964 — A rare case of Tuberculosis Improvement of the Sinus and Nasopharynx otolaryngology (Tokyo) 36: 953 - 56.

Chodosh, P.L. & Willis, W (1970) Tuberculosis of the upper Respiratory Tract *Laryngoscope* 80: 5: 679 - 95.

Martinson, F.D. (1967) Primary Tuberculosis of the Nasopharynx in a Nigerian. *Jour: of Laryngology and Otology*. 81: 229 - 33.

Saito, Y. (1964) Tuberculosis of Nasal Cavity and Sinus Otolaryngology (Tokyo) 36: 197 - 200.

Savic, D., Kosanovic, M., Cvejic, D., (1961) Srpski Arkh. tselok. Lek 89: 99.

Wille, C. (1948) Acta oto-laryng (Stockl) 36: 61.

Caesarean section under local anaesthesia

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IN SPITE OF ancillary advances in modern-day surgery, I think few practising obstetricians will disagree with me (and for that matter even our anaesthetic colleagues) that the hazards associated with anaesthesia are still the "Achilles heel" in obstetrical surgery because the majority of cases in this field are emergency cases. This is especially true in so-called "developing countries" where the "F.F.As." are a precious and rare commodity. Added to this, the mothers here are usually overworked and undernourished. And a great number comes into labour unbooked. This was the situation I found myself in when I became the second M.R.C.O.G. to be in private practice in Kuala Lumpur in 1964.

Method

I shall now describe a typical case I have recently done at the Chinese Maternity Hospital, Kuala Lumpur.

Lean Shin Thye, aged 32, para 0 gravida 2. L.M.P. 16.6.70 was admitted at 2 am. on 31.3.71 unbooked, complaining of having labour pain with show since one hour earlier. She was then in her 41-week pregnancy. She was admitted by a midwife into the "free ward". When I was called at 8.45 am. on 1.4.71, she was 31¾ hours in labour; M.R. 13¼ hours ago and two hours in the second stage with no progress. A vaginal examination revealed Vertex presentation LOA position Caput ++; moulds ++; station 2 +. She had an outlet contracture: the AP diameter of the outlet was barely 3¼" and the subpubic arch was narrow. In my opinion, an accouchement force with forceps was unjustified. And so an emergency L.S.C.S. was decided upon.

For premedication narcosis, I prescribed i.m. Pethilorfan 100 mgm, Sparine 50 mgm and Atropine 1/100 grain. The actual operation began ¾ hour later. 35 ml. of 1% Xylocaine with adrenaline (1 : 160,000) were used to infiltrate the incisional site down to the anterior rectus sheath, i.e. 6" midline subumbilical down to the pubis just short of the hair line. This took exactly two minutes. I waited two minutes before incision. Ignoring minor bleeders and merely clamping major bleeders with artery forceps, it took me six minutes from skin incision to delivery of the head. At this juncture, i/v syntometrine 1 cc. was given. While waiting for the drug to take effect, the infant's mouth and nostrils were cleared of mucus using an electric sucker. The infant was delivered during the next uterine contraction, thus simulating the beneficial effect of squeezing the infant through the natural birth canal.

I left instructions with the staff nurse, who was at the head of the operation table attending to the periodic of BP and pulse, to give a previously diluted Pethidine (50 mgm in 5 ml. water) intravenously through the pre-set i/v drip, if the patient should

groan or show grimaces of discomfort after the baby had been extracted. It was required in this case.

During the operation, aside from the Doyan's retractor to expose the lower uterine segment, no abdominal packing was done.

The rest of the operation, viz. delivery of the placenta and the stitching up, were uneventful. The operation took exactly 46 minutes, skin to skin. Apgar rating of the infant at one minute was 9 and the blood loss was estimated as 15 oz. The puerperium was uneventful. Michels clips were removed on the 5th and 7th day and the patient discharged on the 8th post-operative day.

Indications

Of the 22 cases where case notes are available for review, the indications for Caesarian Section are as follows:—

Foetal distress	—	2 cases
Cord presentation	—	1 case
Maternal factors	—	4 cases
Placenta Praevia	—	6 cases
Cephalo-pelvic disproportion	—	7 cases
Failed trial forceps	—	2 cases

Results

There were no maternal or foetal mortality in these 22 cases.

Discussion

Local and regional anaesthesia is being more widely employed in the last decade even in the United Kingdom, the stronghold of conservatism. I remember, when I was doing my post-graduate work in the United Kingdom in the late 50s, general anaesthesia was required for many obstetric and gynaecological manoevres, eg. forceps delivery, breech delivery, M.R.P., A.R.M., and hystero-salpingogram. Now we see more and more articles from the United Kingdom exhorting the virtues of paracervical block, pudendal block and intravenous basal narcosis.

Basal Narcosis

With the advent of the tranquillizers or ataractics, this trend towards local and regional analgesia and anaethesia has been accelerated. It is indeed surprising to see that in the brief span of about ten years, this group of drugs,the tranquillizers has now occupied second place as the most commonly used agents in medicine (Modell, 1967). In addition to potentiation and prolongation of narcotic drugs, these tranquillizers have profound effects on emotional behaviour creating a "couldn't-care-less" attitude which, in some situations, results in a considerable degree of amnesia. The other valuable effect of these drugs is the anti-emetic effect. These drugs act mainly via the hypothalamic centres which in turn influence, to a great degree, the autonomic activity.

Toxicity of Lignocaine

Although lignocaine has a toxicity twice that of procaine (Hunter, 1951) it has many valuable advantages, such as greater potency and diffusability (Dutton, 1955) so that its use is becoming more widespread.

The maximum safe dose for lignocaine is put at 1 gram. It must be borne in mind that the potency of lignocaine increases in geometrical ratio to concentration (Gordh 1949, Carnegie 1950). Concentrations from 0.5% to 4% with, or without, added vasoconstrictor are the usual concentration employed, the choice depends on the site and quantity required.

In man 10 ml. of 1% procaine can be given intravenously with safety. So presumably ½ of this dose of lignocaine can be tolerated intravenously in man.

It is said that *conduction anaesthesia* is safer for the mother and infant than general anaesthesia (Apgar, 1957). But few can quote results as good as the experts.

Spinal anaesthesia is associated with a high maternal mortality, neurological complications and sequelae (Widdicombe, 1954). It is the "most dangerous type of anaesthesia for pregnant women" (Greenhill, 1952).

Moreover, both the above two methods of anaesthesia are regarded as unsuitable for emergencies and haemorrhagic conditions (Moya, 1960). Apart from the time taken to prepare and to perform the anaesthesia, there is the discomfort and inconvenience necessitated by positioning and shifting about of the patient. For example, in epidural anaesthesia, 15 minutes must elapse between the first injection and the start of the operation.

"*General Anaesthesia* administered by a properly trained anaesthetist to a properly prepared patient is an ideal less commonly attained in obstetric emergencies" (Hodges and Tunstall, 1961).

Unfortunately, the traditional general anaesthesia is also associated with maternal dangers due to vomiting and regurgitation, and the respiratory depression of the foetus from drugs and maternal hypotension and hypoxia (Phillips, 1959).

It is now recognised that a maternal systolic BP of less than 100 m.m Hg. may lead to foetal bradycardia of a definite pathological significance (Hon, 1960). Foetal hypoxia under spinal anaesthesia can be further aggravated by adoption of the supine position (Kennedy, 1950).

In general anaesthesia, all infants delivered with an induction delivery interval in excess of seven minutes may have respiratory depression (Hodges and Tunstall, 1961).

Intrapartum asphyxia is responsible for the majority of preventable perinatal deaths. Many anaesthetic techniques currently used for Caesarean Section do little to alleviate the effects of foetal hypoxia. Indeed, many may even aggravate it (Bonham, 1961).

Emanuel (1965) in his series attributed 15% of maternal mortality to anaesthetic accidents.

Although this series of 22 cases is too small for the purpose of comparison, nevertheless, in our time in Malaysia, it is useful to be able to perform Caesarean Section without too much dependence on the availability of a qualified anaesthetist quite apart from the question of safety to our patients.

Summary

The reasons for local anaesthesia in Caesarean Section are the present lack of qualified anaesthetists and apparently relative safety of the procedure to both mother and child. A detailed description of the technique used is given. A short list of indications and result is appended.

References

1. Apgar, V. et al (1957) *American Medical Association Journal*, 165: 2155.
2. Bonham, D.G. (1961) *British Medical Journal*, 1: 1315.
3. Carnegie, D.M. and Hewer, A.J.H. (1950) *Lancet*, 2: 12.
4. Dutton, W.A. (1955) *Lancet*, 2: 1368.
5. Emanuel, L.A. (1965) *Lancet*, 2: 150 - 1.
6. Gordh, T. (1949) *Anaesthesia*, 4: 4.
7. Greenhill, (1952) Analgesia and Anaethesia in obstetrics. Springfield. Thomas.
8. Hodges, R.J.H. and Tunstall, M.E. (1961). *British Journal of Anaesthesia*. 33: 572 - 88.
9. Hon, E.H. et al (1960) *Journal of Obstetrics and Gynaecology*, 79: 209.
10. Hunter, A.R. (1951) *British Journal of Anaesthesia* 23: 153.
11. Kennedy, F. et al (1950) Surgery Gynaecology and Obstetrics 91: 385.
12. Modell, W. (1967) Drugs of Choice 1966 — 1967 Page 250 - 260.
13. Moya, F. (1960) General Principles in Obstetric anaesthesia. *Bulletin of Sloane Hospital for Women*, 6: 41.
14. Phillips, K.G. (1959) *American Journal of Obstetrics and Gynaecology*, 77: 113.
15. Widdicombe, A. (1954) *American Medical Association Journal*, 154: 1301

Herpes Zoster with severe neurological complication— A report of two cases

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HERPES ZOSTER is a common condition whose skin manifestation is well known since antiquity. Among the Malaysian and Singaporean community of Chinese origin, it is nicknamed the "serpentine" illness. Knowledge of associated neurological paralysis is widespread and much feared. It is the general belief that neurological complications result only when there is bilateral herpetic eruptions on similar dermatomes.

Broadbent (1866) originally described motor paralysis of an arm which was preceeded by herpes zoster. Since then, many cases have been reported of motor involvement, by Waller (1885), Taylor (1896), Barham-Carter and Dunlop (1941), Taterka and O'Sullivan (1943), affecting muscles of the extremities and the trunk, including the diaphragm and those of the cranial nerves. Upper motor neuron lesions were described by Bruce (1907).

Von Barensprung (1861) quoted by Head and Campbell (1900), first established the affliction of dorsal root ganglion and related parts of the spinal nerves. The latter two, in post-mortem examinations of 21 patients, showed that the primary lesions consisted of round cell infiltration and haemorrhages in the posterior root ganglia with secondary changes in the posterior root, the spinal cord, peripheral nerves and skin. Subsequently Lhermite and Nicolas (1928) showed that the nervous system could be more widely affected.

According to Gupta, Helal and Kiely (1969) only one per cent of all cases of herpes zoster are referred to hospital. In reviewing 274 patients, they found 69 (25%) had cranial nerve palsies, 15 (5%) limb paralysis, two bladder and rectal paresis and one trunk paralysis. Neurological complications are therefore not uncommon. Fortunately severe ones are relatively rare and always arouse great interest. Described below are two such patients with extensive involvement of the nervous system.

F.A.J. U.H. R.N. 000838, a 71-year-old Chinese male, was admitted to the University Hospital on 9th August 1967, with a history of pain on the right side of the chest, eight weeks earlier. Three days after the onset of pain, vesicles appeared on the right lateral chest wall at the level of the nipple. Within two to three weeks, the vesicles gradually healed, leaving superficial scars. Four weeks after the onset of symptoms, he developed a weakness of the right leg, followed soon after by a weakness of the left leg. Two weeks later, he felt a mild weakness and numbness of the right hand and fingers. He was constipated for a week or so, which difficulty he relieved with laxatives. He had no disturbance of micturition.

Examination revealed a well-built man. The pupils were equal and reactive to light and accommodation. The fundi were normal. Other cranial nerves were intact. The jaw jerk was brisk. Power in the upper limbs was good and equal. The right upper limb was more clumsy than the left. No sensory impairment was demonstrated. The deep reflexes were intact. In the right lower limb, there was global weakness with an impaired motor power of grade 3. It was also spastic with increased reflexes. An extensor plantar response was present (Babinski's Sign positive). Petallar clonus was demonstrated. Vibration and position sense were impaired below the level of the fifth dorsal dermatome. Pain, temperature and light touch were preserved. On the left side, the power of the lower limb was mildly affected (Grade 4). It was less spastic than the right. Deep reflexes were brisk, but the plantar response was equivocal (Babinski's negative). Proprioceptive sensation was normal. Below the left dorsal seventh dermatome, pain and temperature sensations were impaired.

Over the right fifth dorsal dermatome, there were scars of healed herpetic lesions. This dermatome was hyperesthetic and paraesthetic too.

General examination revealed no other significant findings.

Investigations

The blood contained 12.8 gm% of haemoglobin, a total leucocyte count of 5000 per ul, with a normal differential count. The erythrocyte sedimentation rate was 12 mm in the first hour. The blood Kahn test was negative. A chest X-ray and radiological skeletal survey were normal. No lumbar puncture was done.

Progress

For a while, he experienced neuralgic pains over the healed herpetic lesions. This was easily relieved by mild analgesic. It completely disappeared on the 9th September, 1967. His constipation was relieved by senokot or ducolox. No disturbance of micturition was seen.

He was given physiotherapy. The power of the lower limbs gradually improved. By 28th August 1967, he was able to walk on his own without support, though he still had a slight weakness of the right leg on discharge from hospital. The reflexes were still brisk on the right and the extensor plantar response persisted. Proprioceptive sensations were normal, though superficial modalities of sensation were noticed to be impaired only up to the level of the left knee. He was last seen on 21st November 1967 with almost full recovery, walking well, with no evidence of sensory loss. The right extensor plantar response still persisted.

K.L. U.H. R.N. 127859, a 58-year-old married Indian male, was seen on 26.10.70, with a history of illness which started four weeks prior to admission. Fever and malaise were the initial symptoms. On the fifth day, vesicles were seen on the left side of the neck; the next day, painful vesicles also appeared on the right upper arm which rapidly spread to involve the whole forearm. A week later, he noticed small vesicles on the trunk, face and lower limbs. Three days prior to admission, he fell while going to the toilet. He was helped to bed. Subsequently he was unable to get up because of weakness on both lower limbs and the right upper limb. There was no disturbance of sphincters. He was not a known hypertensive or diabetic. He was a known asthmatic for 18 years.

On examination, he was obese, and mentally alert. Vesicles and pustules on the right upper extremity along the sixth and seventh cervical dermatomes were seen. Scattered over the rest of the body, a few small vesicles and pustules were seen on the trunk and lower limbs. His cranial nerves were intact. Both fundi were normal. The right upper extremity was very weak with wrist drop. No power was found in the small muscles of the hand. On the forearm, upper arm and shoulder girdle muscles, the power was grade 2 to 3. On the left upper extremity, the power was generally grade 4. On the lower limbs, the proximal muscles were more affected with a power of grade 2, whereas distally it was grade 4. Sensory impairment to all modalities of sensation was found below both knees. On the right upper limb, hypalgesia was confined to the sixth and seventh cervical dermatomes. Reflexes were absent in all the limbs. Plantar response was going down on both sides. No significant finding was found in the other systems. Investigations showed a haemoglobin of 16 gm/100 ml with a total white cell count of 9500 cells/ul. The differential count was normal. E.S.R. was 39 mm/hr. He had a total serum protein of 6.2 gm/100 ml, albumin of 3.3 gm/100ml, a globulin of 2.9 gm/100 ml, and an A:G ratio 1.14. Fasting blood sugar was 103 mg/100 ml. Blood urea was 124 mg./ml. Blood and C.S.F. Kahn test were negative. In the C.S.F. 220 lymphocytes/ul, sugar of 110 gm/100 ml, protein of 340 mg/100 ml and chloride of 115 meq/L were obtained. Smears for organisms and cryptococus were negative. Cultures from C.S.F. were negative. E.E.G. was mildly abnormal with delta and theta waves in both frontal and temporal regions. Chest, skull and pelvic X-rays were normal.

Electromyography and nerve conduction studies were performed, three weeks after onset of paralysis. Motor nerve conduction studies showed prolonged velocities affecting the right median and lateral popliteal nerves, and the left ulnar and median nerves. The electromyography showed evidence of fibrillation potentials affecting the muscles of the right limb. No spontaneous activity was seen in other muscles examined, which had reduced interference patterns on maximal contraction. These findings suggested a peripheral neuropathy.

After a week in hospital, he suddenly developed a lower motor neurone type of left facial palsy. Horner's syndrome was also noticed. Wasting of the small muscles of the right upper limbs was becoming noticeable. Gradually the patient improved, and with physiotherapy he began to walk. Movements returned to the fingers of his right hand. When last seen, almost 11 months later, he had returned to his job as a night watchman with little residual neurological deficit.

While in the ward, he was given tetracycline for the superimposed bacterial infections of the herpetic vesicles. Mild analgesics were prescribed for his pain.

Discussion

The latent period for paralysis following herpetic eruptions varies from one day to two months (Taterka and O'Sullivan, 1943). Rarely paralysis preceeds the rash. The latency period is stated to be related to the severity of the neurological complications, a short latent period of less than two weeks was followed by a severe illness while a long one from two weeks onwards leads to less serious complications (Knox, Levy and Simpson, 1961). In case one, the latency was four weeks whereas in case two onset of symptoms appeared less than two weeks.

Both patients were more than 55 years old. It has been noted that severe neurological complications tend to occur more in the elderly. Of the 45 cases reviewed by Gupta et al, all were over 40. The incidence is highest in those in the sixties and seventies.

In the second patient, herpes zoster preceeded a generalised eruption typical of chicken pox. In 1887, Von Bokay, cited by Fee and Evarts (1968) in which he noted the similarity of herpes zoster and varicella. Brain (1933) showed by complement-fixation test that the two viruses are closely related serologically. These two viruses cannot be distinguished from each other by electromicroscopy, (Rake and associates 1948) and by tissue cultures, (Weller and his associates, 1958).

Knox et al, in an analysis of 13 cases, three of which were their own, and the rest collected from the literature, broadly classified the paralytic complications into four main groups. Group 1 consist of those in which flaccid paralysis is localised to the region of the rash. Group 2 consist of those in which there is spastic weakness and sensory impairment with a definite upper level. Group 3 are those with spastic weakness of one or more limbs, associated with sensory involvement and symptoms of brain involvement. Finally the last group are those with widespread flaccid paresis and varying degrees of sensory disturbances following shortly after the eruptions and showing features of peripheral neuritis and polyradiculitis.

In the first patient, the clinical findings exhibited features similar to those of the second group. His neurological symptoms began on the side of the herpetic lesions. With the findings of ipsilateral weakness and impairment of proprioceptic sensation, plus a contralateral loss of superficial sensation, Brown-Sequard syndrome was diagnosed. K. Wilson (1940) reported one of these cases as having an incomplete Brown-Sequard syndrome, after shingles of the twelfth dorsal root, with a paresis of the left leg, a left extensor response and reduction of sensibility on the right leg. Kendal (1957) reported a similar case.

In the second patient, evidence of peripheral neuropathy of the Landry-Guillain-Barre syndrome was confirmed by nerve conduction studies and C.S.F. findings. In addition, the right upper limb muscles, where the site of the initial zoster was situated, were more severely affected as indicated by electromyography, suggesting involvement of the cervical plexus or the anterior horn cells of the cervical spinal cord over several segments. These findings fit in the final group of classification of Knox et al.

The motor paralysis of the second patient involved many more segments than the zoster on the right upper limb. According to the cases reported by Kendall and Ambercrombie (1941), motor and sensory disturbances and the rash may occur in different dermatomes, sometimes even on opposite sites of the rash. Four of the 42 cases reviewed by Taterka and associates were in different dermatomes.

The generally accepted explanation for these neurological complications is that the herpetic virus initiate an "allergic" process leading to demyelination such as is seen in the demyelination following chicken-pox and other exanthema (Miller and

Stanton, 1954). The maximal site of the lesion is at the level of the herpetic lesion.

McAlpine and associates (1959), Knox et al attribute similar varied neurological involvement to a form of demyelination of the long spinal tracts or the peripheral nerves.

Both the patients recovered with minimal residual signs. Gupta et al, in order to settle the controversy between the views held by Doucet (1906) who claimed that improvement was generally rapid and by Brain (1962) who stated that palsies were usually permanent, found that of 45 patients, 30 recovered satisfactorily and eight patients were left with permanent paralysis. Taterka et al found that 16 per cent of their patients recovered with no residual abnormalities. The process usually requires six months to a year. Both these two cases recovered almost completely over a period of one year.

Summary

Two cases of herpes zoster, with severe neurological complications, are described. A 71-year-old man with Brown-Sequard syndrome and the other, 58 years old, with Landry-Guillian-Barre syndrome and cervical motor paralysis, recovered almost completely. The pathogenesis and history of the neurological manifestations are briefly discussed.

References

1. Ambercrombie, R.G.: Herpes Zoster with muscular paralysis and disturbance of sensation. *Brit. Med. J.* 1: 778, 1941.
2. Barham-Carter, A. and Dunlop, J.W.B. Paresis Following Herpes Zoster. A Report of two cases. *Brit. Med. J.* 1: 234-235, 1941.
3. Brain, R.T.: The relationship between the viruses of zoster and varicella as demonstrated by complement fixation reaction. *Brit. J. Exp. Path.* 14: 67-73, 1933.
4. Brain, R.T.: Disease of the Nervous System, 6th Edit. 1962, London. Oxford University Press.
5. Broadbent, W.H.: Case of Herpetic Eruption in the course of branches of the brachial plexus, followed by partial paralysis in the corresponding motor nerves. *Brit. Med. J.* 2: 460, 1866.
6. Bruce, Alexander: Unusual Sequella of Herpes Zoster (Posterior Poliomelitis). *Rev. Neurol of Psychiat.* 5: 885, 1907.
7. Doucet, P.M.C.: Le zone associe aux paralysis et aux amyotrophies. Thesis. Paris. No. 23, 1906.
8. Fee, C.F. and Evarts, C.M.: Motor paralysis of the Lower extremities in herpes zoster. *Cleveland Clin. Quart.* 35: 169-176, 1968.
9. Gupta, S.K., Helal, B.H. and Kiely, P.: The Prognosis of Zoster Paralysis of Bone Joint Surg. 51B: 593, 1969.
10. Head, H. and Campbell, A.W.: The pathology of herpes zoster and its bearing on sensory localisation. *Brain* 23: 353-523, 1900.
11. Kendall, D.: Motor complications of Herpes Zoster.
12. Knox, J.D.E.; Levy, R. and Simpson, J.A.: Herpes Zoster and Landry-Guillian-Barre Syndrome. *J. Neurol Neurosurg-Psychiat.* 24: 167-172, 1961.
13. Lhermitte, J. and Nicollas: Les Lesions spinales du zona; La myelile zosterienne. *Rev Neurol.*, 31: 361-364, 1924.
14. McAlpine, D,; Kurorwa, Y.; Toyokura, Y.; Araki, S.; Acute Demylinating Disease. Complicating Herpes Zoster. *J. Neurol. Neurolsurg. Psychiat* 22(2): 120-3, 1959.
15. Miller, H.G. and Stanton, J.B.: Neurological Sequelae of prophylactic Innoculation. *Quart. J. Med.* 23: 1-27, 1954.
16. Taterka, J.H. and O'Sullivan, M.E.: The Motor complications of Herpes Zoster. *J.A.M.A.* 122: 737-739, 1943.
17. Taylor, F.: A case of shingles followed by paralysis of the abdominal muscles. *Guy's Hosp. Rep.* 52: 37-43, 1896.
18. Rake, G. and others: The relationship of varicella and herpes zoster: electron microscope studies. *J. Bacteriol* 56: 293-303, 1948.
19. Waller, G.: Two cases of Herpes Zoster with motor paralysis. *Brit. Med. J.* 2: 560, 1885.
20. Weller, T.H.; Wilton, H.M. and Bell, E.J.: The etiologic agents of varicella and herpes zoster; isolation, propagation, and cultural characteristics in vitro. *J. Exp. Med.* 108: 843-867, 1958.
21. Weller, T.H. and Wilton, H.M.: The etiologic agents of varicella and herpes zoster; serologic studies with viruses as propagated in vitro. *J. Exp. Med.* 108: 869-889, 1958.
22. Wilson, S.A.K.: Neurology (London) 1: 672, 1940.

Suction curette evacuation of Hydatidiform Mole

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THE DIAGNOSIS AND MANAGEMENT of a patient with hydatidiform mole is as controversial as ever. When the patient does not present with the passage of vesicles, an accurate diagnosis may be difficult. Equally difficult is the line of management to be adopted. Basically two lines of management may be followed, depending on the age and the parity of the patient. Where indicated by age and parity, total abdominal hysterectomy is carried out. In the other patients, the uterine cavity has to be emptied either before or after an abortion, induced with a pitocin drip if necessary. The evacuation of a uterus of more than 16 weeks gestation size, when the patient is not in labour is fraught with danger. A patient is reported here in which both the problems, diagnosis and management, are encountered.

Case history

T.A.N., female aged 21, has regular 28-day cycles. She presented in her first pregnancy when she was 23 weeks gestation (L.N.M.P. 25.11.70). She thought she had felt the baby move. She had been bleeding on and off in her early pregnancy and had been given hormone injections to maintain the pregnancy.

On examination, she was not pale (Hb 13.0 gm:); there was no systemic abnormality; BP 110/70; the uterine size corresponded to 23 weeks cyesis; no foetal impulse was detected with an ultrasonic foetal pulse detector. She had a gross cervical erosion which bled easily. A provisional diagnosis of molar pregnancy was made. Here the problems of diagnosis begins — it is felt that an X-ray may not be justifiable and a urine dilution test will be prohibitive in cost (in a private laboratory the cost is M$10/- for every dilution).

She was observed over three weeks. Her weight increased 3.6 kgm; the blood pressure remained normal and there was no proteinuria or oedema. She vomitted on two occasions and continued bleeding vaginam. Another examination did not reveal any foetal impulse.

Management

The patient was admitted into a nursing home and her blood grouped. (Group A Rhesus Positive). She was given a syntocinon drip (10 1U — 100 1U. per 500 mls. 5% dextrose solution) in an attempt to abort the mole. After eight hours, the cervix was taken up but the os was still closed.

The patient was given bilateral paracervical blocks. With the drip running, the os was easily dilated to Hegar 10. The uterus was completely evacuated, using a suction curette with 10 mm. bore.

When the uterus had contracted, the cavity was curetted with a sharp curette. The whole procedure was completed in eight minutes and the total blood loss less than 500 mls. (The contents of the suction bottle, blood and vesicular fluid measured 400 mls.).

The general condition of the patient was satisfactory thereafter. She has now been discharged and is on weekly follow-up examination. Her chest X-ray is normal and the urine pregnancy test is negative.

Discussion

It is noted that the diagnosis of the hydatidiform mole, prior to its declaring itself, is based entirely on clinical grounds and on the use of the "doptone". The use of the ultrasonic foetal pulse detector has advantages. It is simple to use, does not take time and is reliable after the first trimester. Being a test of foetal rather than chorionic life, it has in some cases obvious advantages over other pregnancy tests (Kuah and Embrey 1968).

The management of this problem is to evacuate the uterus. While authorities in Europe and the United States are very reluctant to approach the problem via the vaginal route, more experienced workers have advocated this. Thus Tow (1966) stated that the procedure, supported by oxytocin infusions and blood transfusion, was found to be completely safe and effective irrespective of the uterine fundal height. However, the procedure is thought to be attended by greater than average risks. (Behrman & Gosling 1966; Jeffcoate 1967). Despite this, any method of evacuating the molar pregnancy that increases the safety further is welcomed.

The use of the suction curette in the management of various forms of abortion is now widely accepted. (Vladov 1967; Vojta 1967; Suter, Chatfield and Kotonya 1970). The use of the suction curette in the evacuation of a molar pregnancy has been reported in the literature. (Melks 1964; Vladov et al 1965; Brandes et al 1966). In the case reported, a molar pregnancy, (uterine size 26 weeks gestation size) was successfully evacuated. A suction curette with a 10 mm diameter was used. Occasionally, the larger vesicles tend to block the orifice of the curette. However, this is easily remedied by rupturing the vesicles after withdrawing the curette. Apart from this, no other difficulty was encountered.

The use of the suction curette in the evacuation of a molar pregnancy has the following advantages:—

1. It is safer than the conventional method of dilatation and curettage.
2. The operation takes less time. (30 seconds to a few minutes, according to Brandes et al 1966).
3. The blood loss is probably less but this clinical impression has to be confirmed by a scientific trial.

References

1. Behrman S.J. and Gosling J.R.G. Fundamentals of Gynaecology. Oxford University Press, New York. 2nd Edition 1966.
2. Brandes, J.M., Grunstein, S. and Peretz, A. (1966); Suction evacuation of the uterine cavity in Hydatidiform mole. *Obstet. & Gynec., 28,* 689.
3. Kuah, K.B. and Embrey, M.P. (1968); Experience with an ultrasonic foetal pulse detector. *Brit. Med. Jou. 1,* 438.
4. Melks (1964); Quoted by Brandes et al (1966).
5. Suter, P.E.N., Chatfield, W.R. and Kotonya, A.O. (1970); The use of Suction curettage in incomplete abortion. *J. Obst. Gynaec. Brit. Cwlth. 77,* 464.
6. Tow, W.S.H. (1966); The influence of the Primary treatment of Hydatidiform mole on its subsequent course. *J. Obstet. Gynaec. Brit Cwlth. 73,* 544.
7. Vladov et al (1965); Quoted by Brandes et al (1966).
8. Vladov, E. (1967); The Vacuum Aspiration method for interruption of early pregnancy. *Amer. Jou. Obstet Gynec. 99,* 202.

Hyphaema and badminton eye injuries

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Introduction

THE AUTHOR HAS BEEN impressed by the frequency of hyphaema due to badminton injuries, especially during the period of the 1970 Thomas Cup finals. This study was undertaken to determine the incidence, level of hyphaema, complications, the final visual results and any possible preventive measures.

Material and Method

The study was conducted at the University Hospital and covers a period of 3½ years, 1968 to June 1971. The criteria for inclusion were (a) traumatic hyphaema within 48 hours of injury and untreated before hospitalisation (b) only blunt injuries (without any evidence of perforation) and (c) without previous ocular disease. 72 patients were admitted from various causes of which badminton accounted for 40 (55.6%) and only this cause is being analysed in the present study.

The following data was compiled for each eye: (a) age, (b) type injury, (c) visual acuity, (d) extent of hyphaema, (e) ophthalmoscopic findings, (f) complications, (g) therapy, medical and surgical and its efficacy, (h) final result and visual acuity.

The patients were given standard treatment: bilateral eye patches, chloromphenicol drops, complete bed rest for five days with the head elevated (2 pillows), adequate sedation, analgesics if needed and daily examination; miotics and mydriatics were avoided. Acetazolamide was given if the tension was raised. Surgical intervention was done only when medical therapy was ineffective in full hyphaema, especially with blood clot or due to glaucoma from the initial or secondary bleeding.

Results and Discussion

Table I lists the causes of hyphaema in 72 cases. Badminton injury is the commonest cause in this country accounting for 55.6% and the discussion is confined to this.

Table II shows the incidence with a peak over a 3-month period (May to July), preceeding, during and following the 1970 Thomas Cup finals. There are undoubtedly many patients who seek no medical care or who are treated by their family physicians, but for this the figure may have been higher. Out of the 40 cases, six were caused by the racket of the double's partner, while the rest was due to the direct effect of the shuttlecock both from the partner and from the opponent.

Table III — 17 cases of hyphaema with a level up to 25% cleared spontaneously, while 25% to 50% accounted for ten of which three had secondary haemorrhage; two of these required surgical evacuation because of increased tension. Fifty to 75% of the group accounted for seven cases of

TABLE I

Causes of Hyphaema

Causes	No.	%
Stone	7	9.6
Stick	7	9.6
Blows, fists, elbows, etc	4	5.6
Badminton	40	55.6
Other sports	4	5.6
Toys	3	4.2
Industrial	4	5.6
Home accidents	3	4.2
Total	72	100.0

TABLE II

Incidence

1968			7
1969			6
1970	May	5	21
	June	6	
	July	6	
Remaining months		4	
1971	Jan — June		5

TABLE III

Degree of Hyphaema

(on admission)

% of anterior chamber filled	No.	Surgically treated
0 to 25%	17	—
25 to 50%	10	2
50 to 75%	7	3
75 to 100%	6	4
Total	40	9

which three required surgery, while above 75%, four of the six needed evacuation. Only when the blood filling the anterior chamber changed from a bright red to a dark colour, or due to increased tension uncontrolled by Diamox or a danger of blood staining of the cornea was surgery undertaken. We could conclude that cases of less than 50% level will clear spontaneously, usually between the 2nd to 5th day, (Table IV), if there was no secondary haemorrhage and cases of over 75% would increasingly require surgery because of slow reabsorption, blood clot, glaucoma or the danger of blood staining of the cornea.

TABLE IV

Day Hyphaema Cleared

(Medically treated — 34 cases)

Day	1	2	3	4	5	6	8
No	2	8	6	6	5	2	2

TABLE V

Incidence of Rebleeding

(Compared with proviously reported series)

Author	Total no. of cases	Cases of Secondary Haemorrhage	%
Thygerson (1952)	29	8	28
Loring (1958)	56	16	29
Greason (1962)	200	12	6
Shea (1963)	113	15	13
Present study (a) all cases	72	12	17
(b) Badminton	40	4	10

Table V: The rate of secondary haemorrhage is 17% for all cases and 10% for badminton compared with the earlier series of Thygerson 29%, Loring 28%, Gregerson 6% and Shea 13%. We have followed the strict conservative regime of Shea and Greason as stated before. Temporary elevation in intravascular pressure brought about by activity tend to increase the chance of secondary haemorrhage (Thygerson) especially from the 2nd to 5th day (Morriss). Some of the full hyphaema may probably be a direct continuation of an increase in bleeding present from the onset of injury and in these cases, the separation between the primary and secondary becomes difficult.

Table VI: The age distribution shows a peak between the 11 to 20 age group. This is the group

TABLE VI

Age Distribution

Age group	All cases	Badminton
0 — 5 yrs	5	—
6 — 10	11	4
11 — 15	14	12
16 — 20	18	15
21 — 25	11	6
26 — 30	5	2
31 and above	7	1
Total	72	40

which mainly plays this game. These active youths should be hospitalised for strict bed rest especially to avoid secondary haemorrhage.

Tables VII & VIII: Visual prognosis is influenced by the damage to the other structures rather

TABLE VII

Complications

Type	No.
Pupillary abnormality	
(a) Traumatic mydriasis (on admission)	18
(persisting after 2 months)	6
(b) Posterior synachae	3
Traumatic cataract	5
Vitreous haemorrhage	4
Macular oedema	8
Macular changes	5
Secondary haemorrhage	4
Blood stained cornea	1
Glaucoma	
(a) Occuring at the time of initial injury	4
(b) Associated with secondary haemorrhage	2
(c) Occuring later	1

than to the hyphaema per se. One or more lesion may be present in the same eye. Cataract is not always evident initially. In three of the cases, the opacity remained localised and maintained good

TABLE VIII

Final Visual Acuity

Visual Acuity	All Badminton Injury	Surgically treated
6/6	21	4
6/9	7	3
6/12	4	1
6/18	2	
6/24	2	
6/36	1	
6/60 or worse	3	1
Total	40	9

vision despite the opacity, two accounted for vision of 6/60 or worse. In vitreous haemorrhage (4) the visual acuity was mainly reduced initially to counting fingers but fortunately all returned to 6/6. Macular or para macular oedema accounted for eight cases — five of which resulted in macular change and this impairment (6/18 to 6/24) is permanent. Glaucoma accounted for seven cases — three settled with medical regime, three required immediate surgery and one three months later; only two resulted in a vision of 6/60 or worse.

The surgical results of evacuation have been good in this series except for one case of blood staining of cornea because the consent for surgery was withheld by the parents for 48 hours. The decision to undertake surgical intervention should be made before irreversible changes take place. In the final result, 52.5% had a vision of 6/6. Prognosis becomes guarded when there are associated complications especially macular change and cataract. Vision of 6/18 or worse accounted for 20%.

Preventive Aspect. In none of the cases was glasses worn at the time of the accident. A number of these cases could have been avoided, nine of them being myopes; four were uncorrected while five took off their glasses while playing. This could have been avoided if the vision was corrected and glasses worn during play — preferably tied on. Since protective goggles cannot be worn to prevent eye injuries, wearing of glasses in those with refractive errors (such errors have a tendency to slow reflex) adequate supervision and proper instruction should lower the incidence as most of these tend to occur in the young and the inexperienced (11 to 20) age group.

Conclusion and Summary

1. Badminton injury was the major cause of hyphaema 55.6% in this country.
2. If level of hyphaema was up to 50% of A/C the haemorrhage will clear spontaneously, if there was no secondary bleeding.
3. Secondary haemorrhage accounted for 10% — the low figure is due to strict bed rest and hospitalisation. Decision for surgery should not be left too late as the changes (glaucoma and blood staining of the cornea) may be irreversible.
4. In the final result, 52.5% had a 6/6 vision. Permanent impairment of vision to 6/18 or worse occurred in 20%; major cause for the loss was due to macular change and cataract.
5. Vision should be corrected and those with glasses should wear them during play, as most of them were inexperienced (11 to 20 age group), adequate supervision and proper instruction should lower incidence.

Acknowledgements

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References

1. Chandran S., and Ooi V.E.S., (1971) A Survey of Ocular Injuries at the University Hospital. *Med. J. of Malaya,* Vol. 25, No. 4, Pg. 280.
2. Darr, J.L., and Passmore J.W. (1967) Management of Traumatic Hyphaema, *Am. J. Ophth.* Vol. 63, Pg. 134-136.
3. Morriss H.M. (1960) Non-Perforating Eye Injuries with Hyphaema, *Am. J. Ophth.* Vol. 49, Pg. 1298-1300.
4. Thygerson, P. and Beard C., (1952) Observations on Traumatic Hyphaema, *Am. J. Ophth.* Vol. 35, Pg. 977 and 982.

Hyperosmolar non-ketotic diabetic coma following Leptospirosis— A case report

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IN 1957, Sament and Schwartz gave the first clinical description of hyperosmolar non-ketotic diabetic coma, although Dreschfeld in 1881 reported two patients with diabetic coma which was not associated with dyspnoea or acetone in urine. Since then, this condition has been recognised more often with 32 cases reported by Danowski and Nabarro (1965) and no less than 63 cases reviewed by Schwartz and Apfelbaum (1966). The main features of this clinical syndrome are absence of ketosis, extreme hyperglycaemia, extreme dehydration and depression of sensorium (Johnson et al, 1969). This is an interesting case of a patient who apparently was admitted for leptospirosis but developed hyperosmolar non-ketotic diabetic coma and died of gram-negative septicaemia.

Clinical Record

H. bin H.L., a 70-year-old retired Malay cook, presented with fever, anorexia and yellowness of eyes of about ten days' duration. He was an old case of acute cholecystitis with cholecystectomy done in 1960. He was seen again in 1965 for epigastric pain, vomiting and passing of dark coloured urine and treated for cholangiohepatitis with a course of tetracyclines. Exploration of the common bile duct was done later, but at operation it was noted that there was a fibrotic gall-bladder with a dilated common bile duct containing clear bile. There was also a large stone impacted in the common bile duct. Cholecystectomy was done again and post-operative recovery was good. He was apparently well until about one month prior to the present admission when he was admitted to the surgical unit for adhesion colic. He was treated conservatively and improved.

He never gave a history of diabetes mellitus but said that while working as a cook in the Police mess, he used to drink alcohol heavily (about $\frac{1}{4}$ to $\frac{1}{2}$ bottle of whisky a day).

Physical examination showed that the general condition was fair. He was febrile and the sclera was noted to be jaundiced. He had palmar erythema and spider naevi were present. He also had gross clubbing of the fingers. The blood pressure was 120/80 mm. Hg. and the liver was palpable, 1+ finger breadth. There was tenderness of the calves.

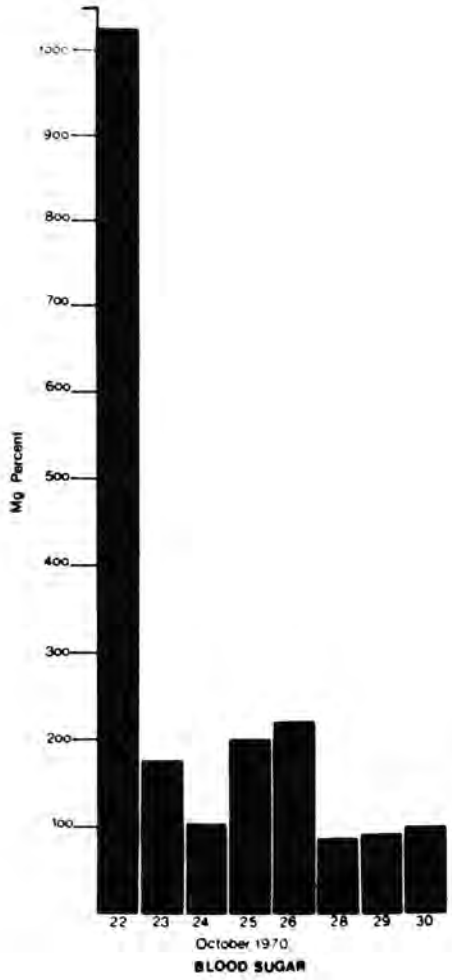
Investigations showed that there was no sugar in the urine and neither were there any bile or bile pigments. The total white count was 27,000/cu.mm. and liver function tests showed that the serum bilirubin was 4.5 mg.%, serum alkaline phosphatase 3.8 King-Armstrong units, serum glutamic-pyruvic

transaminase 300 King's units and albumin and globulin of 2.7 and 4.6 gm.% respectively. The sensitised erythrocyte lysis test (S.E.L.) was positive at 1/1600. A diagnosis of leptospirosis was made and the patient treated with capsules ampicillin 500 mg. 8-hourly. On the same night, he developed chills and rigors and by the next day had developed a temperature of 104°F. He was noted to be delirious. Blood culture was done and the patient given hydrocortisone 75 mg. 6-hourly. The condition, however, did not improve and the antibiotic was changed to injection cephaloridine 500 mg. 8-hourly.

As the patient was still delirious, it was decided to do a blood sugar. This was noted to be 1280 mg.%. The urine was re-tested and was noted to be brown. There was no acetone detected. The osmolarity of blood was 368 while that of the urine 549 mOsm/L. Blood urea was 174 mg.% and serum potassium 2.4; sodium 130 and chloride 100 mEq./L.

A cannula was inserted into the basilic vein and the central venous pressure was monitored. Patient was given six pints half strength normal saline with 10 ml. 10% KCL in each pint. Soluble insulin was also given with the blood sugar coming down to 177 mg.%. The serum osmolarity came down to 326 the next day.

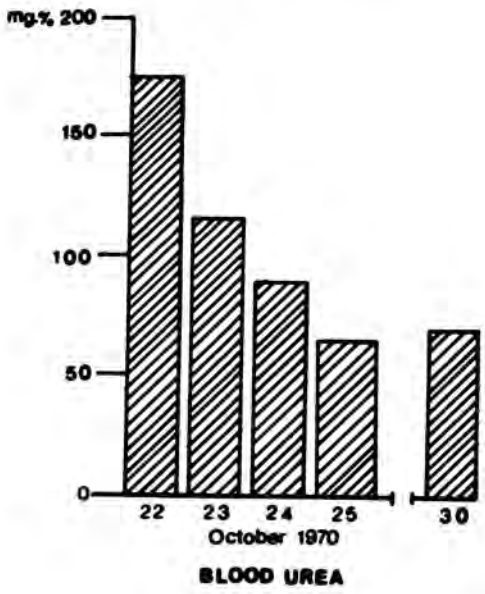
Meanwhile the condition of the patient improved and the blood culture results showed that E. coli was present. He was apparently well until the 30.10.70 when he suddenly collapsed and went into deep coma. There were coarse crepitations in the lungs and the blood pressure was still 120/70 mm. Hg. The blood sugar was 96 mg.% and blood urea 62 mg.%. The patient died without regaining consciousness half an hour later. A post-mortem lumbar puncture showed that it was heavily and evenly stained with blood. There was no post-mortem examination done because the patient was a Muslim.



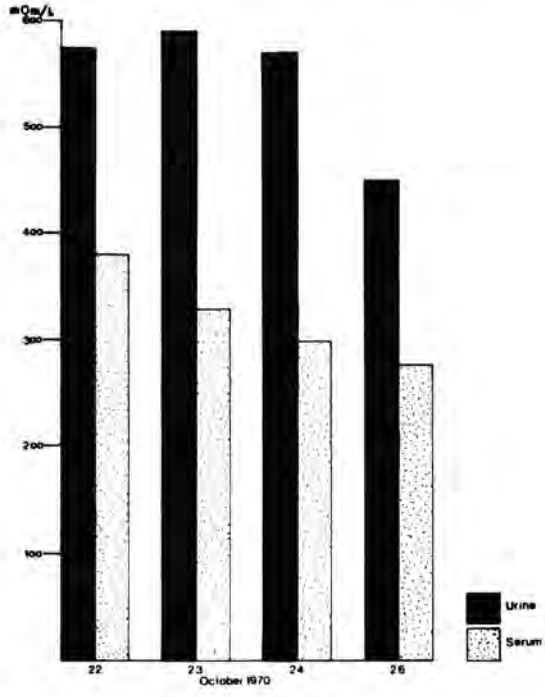
Discussion

Hyperosmolar coma is now increasingly recognised in clinical practice in Singapore. Two cases were reported by Tan, B.Y. et al. and four cases by Lim and Khoo in 1970. The aetiology is not altogether clear although the majority of cases reported in the literature were either mild or previously undiagnosed diabetics (Sheldon and Pyke, 1968; Halmos, Nelson and Lowry, 1966; Schwartz and Aptelbaum, 1965) and often there were also precipitating factors such as infection, stress, large ingestion of carbohydrates (Schwartz and Aptelbaum, 1965), peritoneal dialysis (Aust. Ann. Med., 1970, 3:263), haemodialysis (Potter, 1966), acute pancreatitis (Halmos, 1966), extensive burns (Ashworth et al 1968), steroid and immunosuppresive therapy (Spenney, Eure and Kreisberg, 1969) and dilantin administration (Johnson et al 1969). While Halmos et al. reported a case of septicaemia due to staphylococci, this patient died of E. coli septicaemia. However, it is not known whether the leptospirosis precipitated the hyperosmolar state or whether the hyperosmolar state was precipitated by the steroid administration during treatment. Infection was known to impair glucose tolerance and since the patient had clinical jaundice, liver impairment could have aggravated the hyperglycaemia.

According to Sheldon and Pyke (1968), hyperosmolar non-ketotic diabetic coma was seen more commonly in new diabetics. The age of onset



BLOOD UREA



Serum and urine Osmolarity

of the patient was 71 although Sheldon and Pyke gave an average age of 62 years in their series of cases. Enrlich and Bain (1967) reported the youngest patient with the condition at 1½ years.

Rossier et al 1961 gave results of hyperglycaemia of as high as 2,200 mg.% and also serum osmolarity of 458 mOsm/L. The patient's blood sugar was 1280 mg.% and serum osmolarity of 368 mOsm/L.

This patient was a known alcoholic and together with the previous history of cholangiohepatitis, his prognosis was not good. Schwartz and Apfelbaum (1965-1966) reported a mortality of 50%.

The therapy adopted by the Department of Clinical Medicine, University of Singapore is as follows :—

1. Early detection — this is only possible if one thinks about the condition.
2. Fluids — this is the mainstay of treatment and very rapid infusion of hypotonic saline solutions are made in order to combat hyperosmolarity. This may be supplemented by oral water if the patient can tolerate it. The usual practice is to do a central venous pressure monitoring if the patient has, in addition, developed shock. Half-strength normal saline is given I/V and orally or plain water via a Ryle's tube. As much as 10 to 20 litres may be given over 24 hours.
3. Insulin — soluble insulin is given but because of the absence of ketoacidosis, the response to insulin is very rapid. Moreover, there is also a significant amount of endogenous insulin present in patients as shown by Johnson et al (1969) whose second

CHART SHOWING CLINICAL PROGRESS

DATE	1970 OCTOBER	22	23	24	25	26	27	28	29	30
CLINICAL STATE	PULSE	120	120	78	90	120	110	90	100	110
	B.P	90/50	100/80	120/60	150/70	120/70	140/70	110/70	110/70	110/70
	C.V.P	0	1	1	2					
	STATE OF CONSCIOUS	C	C	C	C	C	C	C	C	U
INTAKE	TOTAL	6330	6280		8100	2940	2570	134-	1600	
	I/V	3430	3030		2200	940	570	340	600	
	ORAL	2900	3250		5900	2000	2000	1000	1000	
OUTPUT		2585	1220		2800	1700	590	1100	800	
SOLUBLE INSULIN UNITS		60	36	44	24	60	48	48	16	16

case had a plasma immunoreactive insulin level of 29 uU/ml. at a blood sugar level of 720 mg.% and by Sheldon and Pyke (1968), whose second case also had a plasma insulin level of 40 uU/ml. at a blood sugar of 2500 mg.%. Therefore it is better to start with smaller doses of soluble insulin than is required for keto-acidosis such as 20 units or less three to four times over 24 hours.

4. Electrolyte balance — with osmotic diuresis, potassium is lost and correction is necessary.
5. Shock — if present, it is advisable to insert a central venous pressure catheter until clinical improvement occurs.

Acknowledgements

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References

Dreschfeld, J. (1881), "Diabetic Coma", *Brit. Med. J.*, 2, 358.

Halmos, P. B. (1966), "Hyperosmolar Non-ketoacidotic Diabetic Coma in a Patient with Necrotising Pancreatitis", *Brit. Med. J.*, 2, 686.

Johnson, R.D., Conn, J.W., Dykman, C.J., Pek, S. and Starr, J.I. (1969), "Mechanisms and Management of Hyperosmolar Coma without Ketoacidosis in the Diabetic". *Diabetes*, 18, 111.

Lim, P. (1970), "Hyperosmolar State associated with Hyperglycaemia — Report of four cases". *Sing. Med. J., Vol. 11, No. 3*, 152.

Peretz, D.I. (1968), "Shock: Some Newer Concepts" Abbottempo, Book 2, 14.

Potter, D.J. (1966), "Death as a Result of Hyperglycaemia Without Ketosis — a Complication of Hemodialysis". *Ann. Intern. Med.*, 64, 399.

Sament, S. and Schwartz, M.B. (1957), "Severe Diabetic Stupor Without Ketosis". *South Afr. Med. J.*, 31, 893.

Schwartz, T.B. and Apfelbaum, R.I. (1965-66), "Nonketotic Diabetic Coma". *Yearbook of Endocrinology* (1965-66), p. 165 Chicago: Yearbook of Medical Publishers.

Sheldon, J. and Pyke, D.A. (1968), "Severe Diabetic Ketosis Precoma and Coma", in "Clinical Diabetics and Its Biochemical Basis", edited by Oakley, W.G., Pyke, D.A. and Taylor, 1st Ed., 451. London; Blackwell Scientific Publications.

Spenny, J.G., Eure, C.A. and Kresberg, R.A. (1969), "Hyperglycaemic, Hyperosmolar, Nonkeroacidotic Diabetes — a Complication of Steroid and Immunosuppressive Therapy", *Diabetes*, 18, 107.

Tan. B.Y., Cheah, J.S., Tan, S.K., and Chew, B.K. (1970), "Hyperosmolar Nonketotic Diabetic Coma". *Med. J. of Malaya*, Vol. 24, No. 4, 308.

Extrusion of fish bone through the neck

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THE FOLLOWING CASE is reported as it is deemed very unusual.

History

On 22-7-71 at about 12 noon, I saw a 70-year-old Chinese male, Yeoh Gan, who pointed to his neck saying that a piece of fish bone was coming out from there. Rather puzzled, I asked him why he knew it was a fish bone. He said that he had swallowed a piece of fish bone during a meal about 2½ months ago. After suffering for a few days from dysphagia, he was all right and forgot all about the incident. On the day of consultation, when he got up in the morning, he became conscious of something protruding under the skin in the neck and he was sure it was the fish bone that he had swallowed that was pushing its way out.

Examination

He appeared to be in good general condition. On the left side of the neck at a point about half an inch above the clavicle and two inches lateral to the midline, the skin was elevated to a height of about 3/16 of an inch. Light pressure on the elevated spot gave the feeling that the skin was being pushed out by a sharp-pointed object. There were no signs of inflammation around the spot. A picture of the patient showing the elevated spot in the neck was taken. (Picture A).

Operation

Under local anaesthetic, a small incision was made in the spot. The sharp point of a whitish fishbone was found presenting in the subcutaneous tissue. It was extracted with ease.

The Fish Bone

It has a very sharp point at one end. The other end is blunt, measuring about 1/10 inch in width. The length of the bone is about ¾ of an inch. The two sides of the bone are lined by a row of closely set fine barbs pointing away from the sharp-pointed end. This kind of bone with side barbs comes from certain ray-fish. A picture of the bone under magnification was taken. (Picture B).

Discussion

It is obvious that the happy ending of the episode of swallowing the fish bone in this case was due to the bone having a sharp point which enabled it to penetrate the soft tissues of the neck starting from the upper part of the oesophagus and those side barbs pointing away from the sharp end which

Fig. A

Fig. B

ensured that the muscular contractions from deglutition and neck movements would push the bone onward only in one direction. The side barbs made it impossible for the bone to move backward away from sharp end. Thus the bone was progressively pushed towards the skin until the sharp end had reached the subcutaneous tissues. Then and there the outward movement of the bone was stopped because the skin was too tough for the sharp end of the bone to pierce. Otherwise, the bone would have extruded itself completely without any outside help.

Acknowledgement

My thanks are due to Mr. Richard Lo who took the picture of the bone under magnification and to Miss Chin Mui Choo for typing out the manuscript.

Hypoglycaemia induced in fasted cats by aqueous extracts of *Pithecellobium Jiringa*

by O. I. Thevathasan

Ph. D

Introduction

EVER SINCE JANBON and his co-workers (1942) discovered that a sulfonamide induced hypoglycaemia, the search has been on to discover other orally administered hypoglycaemic agents. This preliminary report shows that the seeds of Pithecollobium jiringa, which are eaten locally by Malays for their diuretic effect (Birkhill 1935), may have a hypoglycaemic action as well.

Materials and Methods

Samples of *Pithecellobium jeringa* ("Buah Jering" in Malay) were obtained from the market place at various times during the year. The pericarp was removed, and the seeds of the legume, together with the testa, were cut into small pieces using a razor blade. About 200 gms of cut seed were mashed in a Whering blender with 200 ml. of distilled water. The mash was then squeezed in a domestic fruit juicer and the extract collected. The resultant aqueous extracts had a pH which ranged from 5.3 — 5.8, close to isotonicity (approximately 240 mOsmoles). Aliquots (about 10 ml) were frozen and stored at — 20°C, and thawed immediately before use. A portion of each batch of extract was evaporated to dryness and the amount of solids per ml determined. The solid content ranged from 27.5 — 34 mg/ml.

The dose selected was 1 ml of extract per kg of body weight of the cat.

Fasted (24 hrs) cats of both sexes were anesthetised with Pentobarbital (Sagatal) at a dose of 35 mg/kg body weight by intraperitoneal injection. This was usually sufficient to maintain the animal under deep anesthesia for the entire experiment. Occasionally a booster injection of Pentobarbital had to be given. The femoral vein was cannulated and the animal was heparinised. A specially made T-form cannula of plastic tubing was inserted into the right carotid artery so that continuous flow of blood through the artery occurred after it was secured in place. The side-arm with a small rubber tube was clamped off, and released when samples of arterial blood were required. A small amount of blood was discarded each time before collecting samples in order to avoid contamination of samples by blood trapped in the dead space of the side-arm.

Haematocrits were determined at the beginning and end of experiments, and were found not to be significantly altered.

In pilot runs, the blood pressure was recorded. Apart from a rapid transient rise in blood pressure which occurred soon after the extract was given, no further changes occurred.

One ml samples were drawn from the carotid cannula each time. Samples were obtained 30 minutes before the injection of the extract, immediately after the injection and at hourly intervals for the total duration of the experiment. Control animals were given 1 ml/kg body weight of normal physiological saline but were otherwise treated in the same way.

The blood was centrifuged immediately after collection, the plasma transferred to a clean test tube, sealed with parafilm and stored at 4°C in a refrigerator until the end of the experimental run. Blood glucose was determined by the glucose oxidase method (modified from Raabo and Terkildsen 1960), using a Sigma glucose oxidase kit.

Paired statistical comparisons of the blood glucose levels of the experimental and control series at each sampling period were performed, using the "t" test. Only those results which showed a probability of $p = 0.05$ or less were deemed significant and those at $p = 0.01$ or less, highly significant.

Results

The results are shown in Figure 1 and Table I.

A regular pattern in the blood glucose levels is seen (Figure 1) in animals treated with the Buah Jering extract, i.e. a rise in blood glucose immediately after the extract was given (0 hr), followed by a slow steady reduction which reached a maximum at 4 hrs, and was still present 5 hours after the extract was given. The experiments were carried on, in a few cases until 7 hours, at which time this lower blood glucose continued to manifest itself.

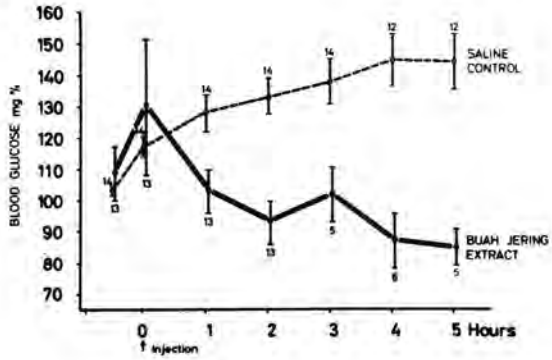
Figure 1 also shows a different pattern of blood glucose levels in saline-treated cats, viz. a slow rise in blood glucose throughout the experimental period. This result indicates that the apparent hypoglycaemic effect of the Buah Jering extract was not due to a spontaneous lack of glucose in these 24-hour fasted cats.

The paired comparisons between these two groups showed that the apparent hyperglycaemia at 0 hr was not statistically significant; while at one hour after the injection the probability that the slight hypoglycaemia was significant was only slightly greater than $p = 0.05$ (i.e. 0.07) but less than $p = 0.1$. This trend, however, became clearly established by 2 hours, and persisted in a highly significant manner throughout the remainder of the experimental period. It therefore appears that there is acting within cats treated with Buah Jering extract a factor clearly exerting a potent long-lasting hypoglycaemic effect.

The "active" principle is not only soluble in water but stable when kept frozen at — 20°C for several weeks — about 2/3 of the cats in this series were treated with thawed extracts which had been stored frozen. Its heat lability is suggested by results shown in Table I, where one cat given extract, portions of which had been heated over a steam bath for 30 minutes, failed to manifest any blood sugar lowering activity. Similarly, all such activity appeared to have disappeared in a cat treated with an extract of mash (Table I) which had been dried at 37°C for several days.

Discussion

The seeds of the *Pithecellobium Jeringa*, a species of the family Leguminosae, (Burkill 1935) are eaten by the Malays especially during the fasting month (puasa). They are used as flavouring, and eaten either boiled or in salads. Both immature and ripe seeds are used. According to Hooper (Burkill 1935), the seeds contained 70% starch, together with small amounts of fats, a volatile sulphuretted allyl compound, and an alkaloid.



It is common knowledge among local Malays that the seeds act as a diuretic. The allyl compound is excreted through the kidneys. In large amounts, it is reported to cause renal inflammation, and even "stricture" which may be fatal (Burkill 1935). There have been no reports on the hypoglycaemic effect.

The effect is mild in the doses used (i.e. 1 ml/kg body weight or 27-34 mg of solids/kg body weight). Low doses were chosen in order that any renal damage might be avoided.

Two mechanisms by which the *buah jering* extract can cause a hypoglycaemic effect are either by direct action of an active principle in the extract, or by a principle in the extract being first converted to an "active" intermediate *in vivo*. Figure 1 indicates that immediately after the extract is given, there is a rise in the mean blood glucose level, albeit not statistically significantly. It is known that hyperglycaemia triggers the release of insulin from the pancreas. Tolbutamide acts indirectly by stimulating the release of insulin from the pancreas (Loubatieres, 1957). All cats used in these experiments were normal, allowing such a mechanism of insulin release to operate in them. On the other hand, the biguanidines exert a hypoglycaemic action

TABLE I

Treatment	No. of Cats	Before	0 hr.	1 hr.	2 hr.	3 hr.	4 hr.	5 hr.
Saline	13	103 ± —1.7	117 ± —4.3	129 ± —6.0	134 ± —6.8	139 ± —7.0	146 ± —9.5	145 ± —9.5
Steamed Extract	1	110	135	118	165	210	210	225
Dried Mash Extract	1	110	120	155	185	185	195	220

Blood glucose levels in cats treated with saline or Pithecollobium jiringa extracts which have been steamed or dried.

in alloxanised animals (Read & Fodden, 1954). Thus another possibility is that the active principle involved here might also act directly, independently of the pancreas as in the biguanidines. These avenues have not been explored so far.

In the light of the reported diuretic effects produced by *Pithecollobium jeringa,* the possibility that the active principle was causing a glycosuria was looked into. In two cats, the bladder was catheterised and the urine tested with Clinsticks during the entire experimental period for any sign of glucose in the urine. No trace was ever found.

There are indications that the active principle is not heat stable (Table I).

The saline-treated control series of cats displayed a slow but persistent rise in blood sugar level until it was quite noticeable at the end of 5 hrs. It is possible that the initial (immediate) rise in blood glucose observed at the time of the injection (0 hr) in these cats is an indication of the minor stress of the volume of the fluid injected (1 ml of physiological saline/kg body weight), but that the steady later rise is a reflection of the lightening anesthesia.

Suskind and Rahn (1954) have shown that following pentobarbital administration (intraperitoneally) to dogs there is also a rise in alveolar and arterial pCO_2. The increase in sympatho-adrenal activity in response to hypercapnia has been demonstrated in conscious man by Sechzer et al. (1960). The importance of the sympatho-adrenal system in cardiovascular responses to hypercapnia in the dog and cat has been demonstrated by Honig and Tenney (1957).

It seems possible then that in these cats the rising hypercapnia activates the sympatho-adrenal system leading to a hyperglycaemia, especially in view of the lightening anaesthestic state. From the above, it does appear the prevention of this rise in blood glucose by the extract may, in fact, be more pronounced in normal unanesthetised cats.

Summary

Aqueous extracts of the ripe and immature seeds of a Malaysian legume, *Pithecellobium Jeringa,* appear to prevent a rise in the blood glucose level in fasted cats under pentobarbital anesthesia. The effect is not an immediate one, but develops gradually during the first hour after injection of the extract, and persists for at least 5 hours. The effect is apparently not due to a lowering of the renal threshold for glucose. This property of the extract appears to be heat labile, but the fresh extract can be kept frozen at — 20°C for several weeks without loss in activity.

Bibliography

1. Janbon, M., Chaptal, J., Vedel, A., and Schaap, J. Accidents hypoglycemiques graves par un sulfamidothiadiazol (le VK57 on 2254 R.P.). *Montpell. Med.* 1942 *21-22*: 441-444.
2. Burkhill, I.H. A dictionary of economic products of the Malay Peninsula 2 Vols. 1935 Government Printers pp. 1758-1763.
3. Raabo, E., and Terkildsen, T.C. On the enzymatic determination of blood glucose. *Scan. J. Clin. & Lab. Invest.* 1960 *12:* 402-407.
4. Loubatieres, A. The mechanism of action of the hypoglycemic sulfonamides. A concept based on investigations in animals and man. *Ann. N.Y. Acad. Sci.* 1957 71: 192-206.
5. Read, W.O. and Fodden, J.H. Influence of synthalin A on glucose absorption in normal and experimental animals. *Metabolism* 1954, *3:* 456-461.
6. Suskind, M. and Rahn, H. Relation between cardiac output and ventilation and gas transport, with particular reference to anesthesia. *J. Appl. Physiol.* 1954, *7: 59-65.*
7. Sechzer, P.H., Egbert, L.D., Linde, H.W., Cooper, D.Y., Dripps, R.D. and Price, H.L. The effect of CO , inhalation on arterial pressure, ECG, and plasma catechol amines and 17-OH corticosteriods in normal man. *J. Appl. Physiol.* 1960, *15:* 454-458.
8. Honig, C.R. and Tenney, S.M. Determinants of the circulatory response to hypoxia and hypercapnia. *Am. Heart J.* 1957, *53:* 687-698.
9. Hooper (cited in Burkill 1935). *In Ann. Rep. Ind. Mus. Industr. Sect. for 1904-5* p. 31.

Book Reviews

INSECTICIDE RESISTANCES IN ARTHROPODS by A.W.A. Brown and R. Pal. 2nd Edn., World Health Organisation, Geneva 1971, p.p. 491 £3.60.

THE SECOND EDITION of Insecticide Resistance in Arthropods is the most comprehensive, authoritative and up-to-date book on resistance in arthropods and has been eagerly awaited by many research workers in this field.

It has seven chapters and three appendices, covering all important aspects of insecticide resistance. The authors have defined the nature of insecticide resistance and the methods of detection and measurement of resistance in arthropods. They have reviewed the variables affecting the susceptibility levels of different stages of insects and the magnitude of resistance developed in insects to different types of insecticides in the fields and in the laboratories. The effects of insecticide selection and resistance on the morphology and physiology of insects and on their control are discussed. Emphasis is also given to the mechanism and inheritance of resistance in insects to various compounds.

The problem of insecticide resistance is surveyed on a global basis and numerous references are made to the insecticide resistance situation in Malaysia and other Southeast Asian countries.

This is an invaluable reference book to field and laboratory research workers active on any facet of the problem and an excellent guide to entomologists and public health workers who are engaged in insect control and eradication programmes.

V. Thomas

CHEMOTHERAPY AND DRUG RESISTANCE IN MALARIA by W. Peters, Academic Press, London and New York 1970 p.p. 876 £13.00.

PROFESSOR PETERS, of the Liverpool School of Tropical Medicine, has done a great service to malariologists throughout the world by his timely and exhaustive survey of the literature on drug resistance in malaria. Chloroquine has long been regarded as the drug of choice against malaria but recently it has been shown that strains of *Plasmodium falciparum* exist in Southeast Asia which are not so susceptible to this drug. The war in this region and the consequent spread of these strains have intensified the interest in the chemotherapy of malaria, and research workers found themselves in need of a comprehensive and up-to-date review of the rapidly expanding literature on drug resistance. Professor Peters has fulfilled this need excellently. His intimate knowledge of the subject, to which his own contributions have been considerable, has helped him to produce a volume that is detailed and critical. By his close contact with co-workers in this field and by arrangement with publishers to include a substantial addendum, it has been possible for him to include even material that had not been published at the time of going to print.

After devoting the introductory chapters to the malaria parasite and host-parasite relationships, various techniques for the study of drug resistance are dealt with, followed by chapters on experimental drug resistance, drug resistance in human malarias and the pharmacology and mode of action of antimalaria drugs. There is a chapter devoted to resistance as a problem in control and eradication of

malaria and an addendum on current research trends. There are more than 100 pages of references while about 50 pages are devoted to an index of authors and a subject index.

This is a volume which should find its way into every medical library and into the hands of every research worker in malariology.

SAMSON WRIGHT'S APPLIED PHYSIOLOGY — Revised by Cyril A. Keele and Eric Neil 12th Edn. Oxfod Univ. Press. London. 1971 p.p. 576, figs. 481 Paper covers £3.50 net, Boards Edn. £5.00 nett.

THIS EXHAUSTIVE TREATISE, well recognised as a standard text on a very important topic for the serious medical practitioner and students of medicine and science, has been extensively revised to take into account the many existing advances that have been made in the last six years since the publication of the last edition.

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This authoritative and comprehensive volume on applied physiology should be on the shelves of all medical and physiological libraries and be available for consultation by the serious student and practitioner requiring up-to-date information.

PHYSIOLOGY FOR PRACTITIONERS—Edited by Ian C. Roddie, Churchill Livingstone 1971 Edin. & Lond. p.p. 202 £1.50 net.

DR. W. A. R. Thomson, editor of the *Practitioner* in the foreword explains the genesis of the book. A middle-aged general practitioner, who found current textbooks and monographs so obtuse as to be almost incomprehensible, asked whether the *Practitioner* could publish a series of articles explaining the intricacies of modern physiology in as asimple terms as possible. The 24 articles which appeared in the *Practitioner* throughout 1969 and 1970 have been so well received that they have now been published in book form. The busy practitioner of today who is anxious to keep up-to-date and thereby provide a better service to his patients will find this compact volume easy to read and digest.

A HANDBOOK FOR RESEARCH IN GENERAL PRACTICE — Edited by T. S. Eimerl and A. J. Laidlaw. Livingstone, Edin & Lond. 1969. 2nd Edn. p.p. 155.

THIS IS A HANDBOOK for research in general practice undertaken by the Editors for the Royal College of General Practitioners. It is becoming increasingly evident that organised research in academic and hospital circles can be usefully supplemented by the pooled observation by guided general practitioners who, after all, are the new ones to see the beginnings of illness, follow it through its stages and see it in its true perspective.

This book gives valuable information and advice to the general practitioner aspiring to undertake research either alone or within a group. A family doctor's ordinary records could, with a little forethought and discipline, be used as research material. By undertaking research, the general practitioner will not only be of service to medicine but will become a more knowledgeable person and be able to offer a better standard of care to his patients. This book gives in simple terms sound advice and guidance to research in general practice and should be in the hands of every doctor.

CORRIGENDUM

An earlier than final version of the paper: "Outpatient treatment of psychotic patients with a long-acting phenothiazine: Fluphenazine decanoate" was printed by error in the December 1971 issue of the Journal. For those interested, a final corrected version is available from the authors.

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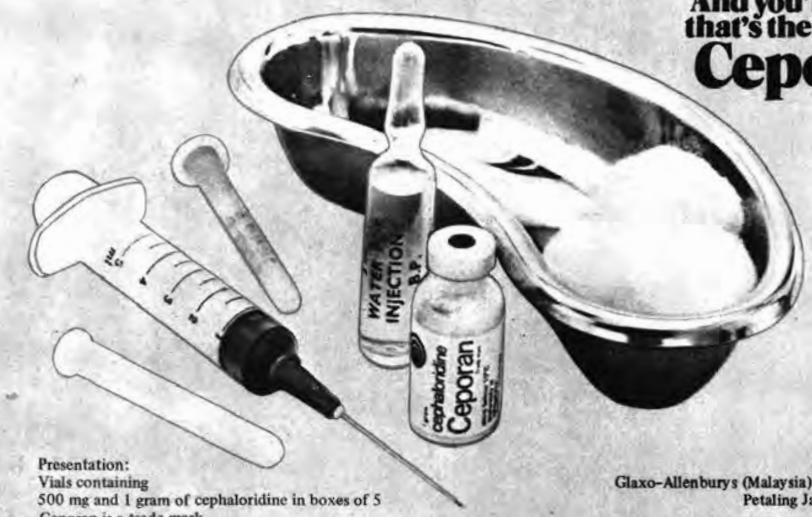

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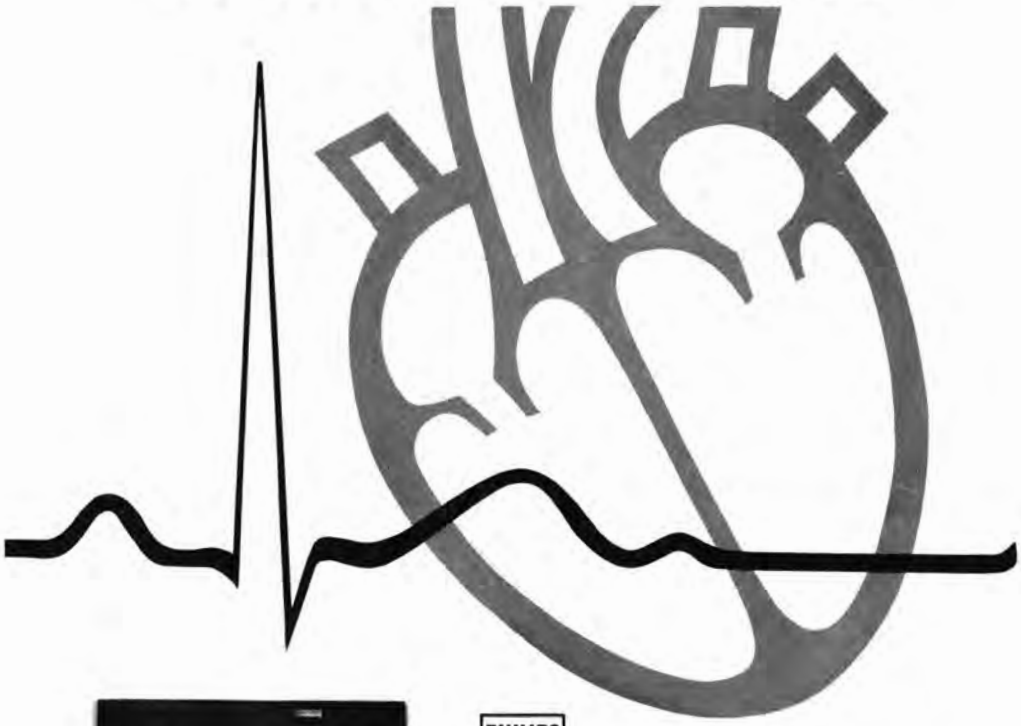

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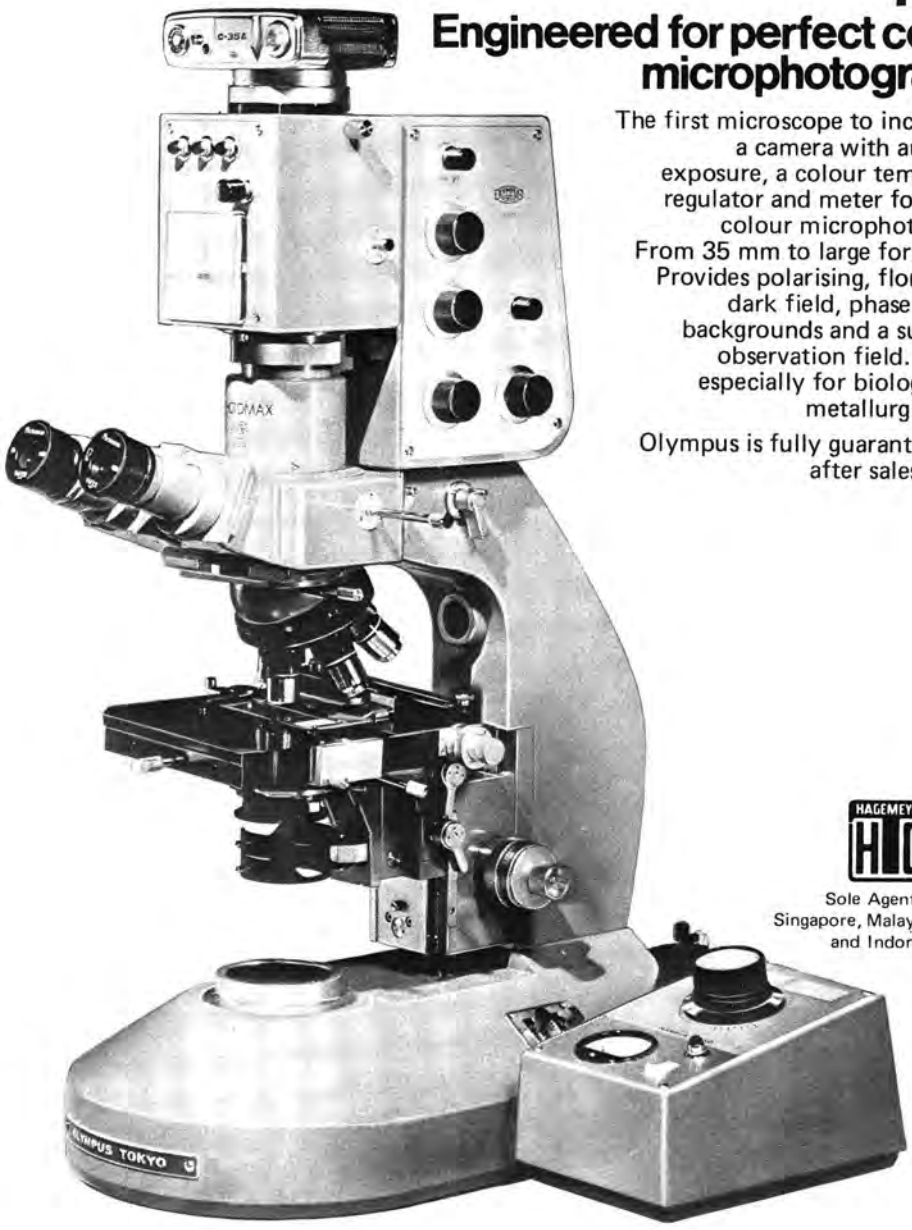

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