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# Medical ethics and the Commonwealth

*by A. A. Sandosham*

AT THE LAST MEETING of the Council of the Commonwealth Medical Association held in Kuala Lumpur and Singapore, the writer discussed some of the problems of medical ethics in Malaysia. It was suggested that similar problems were probably confronted in some of the other countries of the Commonwealth all of which had based their ethical code on the British pattern which, in turn, has been modelled on the conventional rules of behaviour of our profession as laid down by the big-wigs of Greece nearly 2,400 years ago. It is true that sporadic attempts have been made to modify the Hippocratic oath but none of them has adequately met the changing views of this atomic age.

Even more important is the need to adapt the ethical rules to reflect local conditions and take into account the cultural background, religious beliefs and social development of the people served. With this end in view, the suggestion was made that the Commonwealth Medical Association sets up a sub-committee to study this problem and make recommendations that could be the basis for the National Medical Associations to modify their own ethical codes. The Singapore Medical Association and the Malaysian Medical Association were to undertake this task and get in touch with the Commonwealth countries.

Dr. Gwee Ah Leng of Singapore has put forward certain suggestions for consideration which

have not received the concurrence of some of his colleagues. He is of the opinion that the elaboration of disciplines within medicine produces doctors with interests different from that of the care or relief of a patient alone. There are those who may feel committed to the interest of progress of pure knowledge and others concerned with the weal of the community as a whole rather than that of the individual patient. He thinks that ultimately we should evolve a separate code of ethics to suit the different groups.

The Malaysian Medical Association has not put forward its views on the subject yet. It may be desirable for it to organise a symposium on medical ethics and get speakers to introduce various aspects of the subject for open discussion so that we can consolidate our views in relation to the local setting. One can think of many topics for discussion at such a forum, including the legal aspects of medical ethics, abortions, sterilisation, ethics in medical education, professional secrecy, organ transplantation, human experimentation, society's claims on the profession, euthanasia and eugenics. The early formulation of our stand on this matter is desirable since in the revised Constitution of the Commonwealth Medical Association, it is proposed to include the basic principles of medical ethics acceptable to the Commonwealth member countries.

# Our heritage

by *B. R. Sreenivasan*

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MEDICINE HAS ITS ORIGINS in the dim and murky past. The evolution of medicine may best be considered in its three phases, viz. Magic, Religion and Science.

## **Magic**

Science and Magic are more related than would appear at first sight. Sir James Frazer, in his *Golden Bough*, points out that science and magic have the common property that in both the laws of nature are respected and take their natural course, whereas religion involves a belief in a superhuman being or beings and a belief that the superhuman being or beings can be persuaded to intercede on behalf of any one who prays to change the current of nature in such a way as to benefit him. This elasticity or flexibility is alien to both magic and science both of which hold that nature's laws are inflexible. They cannot be deflected by prayer or intimidation.

When we analyse the principles of thought on which magic is based, they fall into two types, the first being that like produces like and the second that things which have been in contact continue to act on each other even if separated by a distance. These two principles may be termed the Law of Similarity which gives rise to homeopathic magic and the Law of Contact which gives rise to contagious magic.

The following examples will make the position clear.

## **Homeopathic Magic**

The ancient Hindoos performed an elaborate ceremony, based on homeopathic magic, for the cure of jaundice. Its main drift was to banish the yellow colour to yellow creatures and yellow things, such as the sun, to which it properly belongs, and to procure for the patient a healthy red colour from a living, vigorous source, namely a red bull. With this intention, a priest recited the following spell: "Up to the sun shall go thy heartache and thy jaundice: in the colour of the red bull do we envelop thee! We envelop thee in red tints, unto long life. May this person go unscathed and be free of yellow colour! The cows whose divinity is Rohini, they who, moreover, are themselves red (rohinih) — in their every form and every strength we do envelop thee. Into the parrot, into the thrush, do we put thy jaundice, and, furthermore into the yellow wagtail do we put thy jaundice."

While he uttered these words, the priest, in order to infuse the rosy hue of health into the sallow patient, gave him water to sip which was mixed with the hair of a red bull; he seated him on the skin of a red bull and tied a piece of the skin to him. Then in order to improve his colour by thoroughly eradicating the yellow taint, he proceeded thus. He first daubed him from head to

foot with a yellow porridge made of turmeric or curcuma (a yellow plant), sat him on a bed, tied three yellow birds, to wit a parrot, a thrush, and a yellow wagtail, by means of a yellow string to the foot of the bed; then pouring water over the patient, he washed off the yellow porridge, and with it no doubt the jaundice, from him to the birds. After that, by way of giving a final bloom to his complexion, he took some hairs of a red bull, wrapt them in gold leaf, and glued them to the patient's skin.

The ancients held that if a person suffering from jaundice looked sharply at a stone-curlew, and the bird looked steadily at him, he was cured of the disease. "Such is the nature," says Plutarch, "and such the temperament of the creature that it draws out and receives the malady which issues, like a stream, through the eyesight." So well recognised among bird-fanciers was this valuable property of the stone-curlew that when they had one of these birds for sale, they kept it carefully covered, lest a jaundiced person should look at it and be cured for nothing. The virtue of the bird lay not in its colour but in its large golden eye, which naturally drew out the yellow jaundice. Pliny tells of another, or perhaps the same, bird, to which the Greeks gave their name for jaundice, because if a jaundiced man saw it, the disease left him and slew the bird. He mentions also a stone which was supposed to cure jaundice because its hue resembled that of a jaundiced skin.

### Contagious Magic

"..... in many parts of the world, it is customary to put extracted teeth in some place where they will be found by a mouse or a rat, in the hope that, through the sympathy which continues to subsist between them and their former owner, his other teeth may acquire the same firmness and excellence as the teeth of these rodents. For example, in Germany it is said to be an almost universal maxim among the people that when you have had a tooth taken out, you should insert it in a mouse's hole. To do so with a child's milk-tooth which has fallen out will prevent the child from having toothache. Or you should go behind the stove and throw your tooth backwards over your head, saying, 'Mouse, give me your iron tooth; I will give you my bone tooth.' After that your other teeth will remain good. Far away from Europe, at Raratonga, in the Pacific, when a child's tooth was extracted, the following prayer used to be recited:

*"Big rat! little rat!  
Here is my old tooth,  
Pray give me a new one."*

Then the tooth was thrown on the thatch of the house, because rats make their nests in the decayed thatch. The reason assigned for invoking the rats on these occasions was that rats' teeth were the strongest known to the natives."

### Combined Homoeopathic and Contagious Magic

The two types of magic are often mixed as in the following instance, "A Malay charm..... is as follows. Take parings of nails, hair, eyebrows, spittle, and so forth of your intended victim, enough to represent every part of his person, and then make them up into his likeness with wax from a deserted bees' comb. Scorch the figure slowly by holding it over a lamp every night for seven nights, and say:

*"It is not wax that I am scorching,  
It is the liver, heart, and spleen of so-and-so  
that I scorch."*

After the seventh time burn the figure, and your victim will die. This charm obviously combines the principles of homoeopathic and contagious magic, since the image which is made in the likeness of an enemy contains things which once were in contact with him, namely, his nails, hair, and spittle. Another form of the Malay charm is to make a corpse of wax from an empty bees' comb and of the length of a footstep; then pierce the eye of the image, and your enemy is blind; pierce the stomach, and he is sick; pierce the head, and his head aches; pierce the breast, and his breast will suffer. If you would kill him outright, transfix the image from the head downwards; enshroud it as you would a corpse; pray over it as if you were praying over the dead; then bury it in the middle of a path where your victim will be sure to step over it."

It was inevitable that the medicine man would also be the learned man. Since magic and medicine were both part of the power that ruled primitive society, the physician was expected to know nearly everything. This idea still exists and medical practitioners have been called doctors or learned men. The diploma of the Royal College of Physicians of London, in electing a Member to the Fellowship, says "*approbasse et in Societam nostram cooptasse doctum et probum virum*" i.e. we approve and elect to our Society the learned and upright man. It is, in fact, a sad thing that medicine has become so isolated and so highly technical that most doctors of to-day are relatively uneducated.

### Religion

In the days when magic was the main answer to life's problems, the person who studied and

practised magic became a learned man or doctor who made use of his learning to heal the sick. But man passed on from the magic phase to the religious phase. Religion as indicated above depends on a belief that prayers will have the effect of deflecting the laws of nature.

At the same time, learning passed largely into the hands of priests. In ancient Egypt, the priests were often physicians as well. The special God of Egyptian medicine is Imhotep who was probably a king or a priest, expert in medicine, who lived at the time of the Third Dynasty. Both in Europe and in India, priests were, and to a less extent still are, the learned class. The Catholic Church, especially its Jesuit branch, consists of numerous scholars and so does the Brahmin creed. In recent years, we have had proof of this in the persons of Pierre Teilhard de Chardin and Sri Radhakrishnan. The former, a zoologist by profession, is a French Catholic priest who wrote that scholarly and penetrating study "The Phenomenon of Man" to which Julian Huxley has contributed an appropriate preface. Sri Radhakrishnan, the first President of India, is a Brahmin of deep and wide learning.

Thus medicine — the art of healing being apparently the most impressive of all callings, — passed from the company of magic to that of religion. With the acceptance of divine intervention, miracles became possible. A few examples will make this clear.

#### St. Luke

"And as he entered into a certain town, there met him ten men that were lepers, who stood afar off,

And lifted up their voice, saying: Jesus master, have mercy on us,

Whom when he saw, he said:

Go, shew yourselves to the priests.

And it came to pass, as they went, they were made clean."

"Now it came to pass, when he drew nigh to Jericho, that a certain blind man sat by the wayside, begging.

And when he heard the multitude passing by, he asked what this meant.

And they told him that Jesus of Nazareth was passing by.

And he cried out, saying: Jesus, son of David, have mercy on me.

And they that went before, rebuked him, that he should hold his peace: but he cried out much more: Son of David, have mercy on me.

And Jesus standing, commanded him to be brought unto him. And when he was come near, he asked him,

Saying: What wilt thou that I do for thee? But he said: Lord, that I may see.

And Jesus said to him: Receive thy sight: thy faith hath made thee whole.

And immediately he saw, and followed him, glorifying God. And all the people, when they saw it, gave praise to God."

Our Lady of Lourdes is well known for the ability to cure those who were pronounced incurable by well qualified doctors. In fact, a committee of eminent doctors studied the cases and it is said they were satisfied the cures were genuine.

#### Science

Notwithstanding the fact that Hippocrates had brought scientific thought and method to medicine, medicine continued for many centuries to be related to magic and religion. It was in Salerno as late as the twelfth century that a separation was brought about between medicine and religion. Roger, King of Sicily, enforced a law whereby only those who had showed in the state examination that they had fulfilled the necessary course of studies were permitted to practise medicine "in order that the king's subjects should not incur danger through the inexperience of their physicians." Frederick the Second also recognised the importance of the school of Salerno in 1224 and passed legislation regarding the study of medicine.

In Salerno at that time, candidates had to undergo three years of general studies as a preparation for the medical course which consisted of four years, followed by one year spent in practising medicine under the supervision of a senior medical practitioner. This arduous preparation is exactly the same as is now in force in the United States, viz. three years of liberal arts, four years of medicine, one or two years of internship before being licensed to practise.

The physicians did not practise surgery which was regarded as an inferior art and not worthy of scholars such as physicians. The physician gave written advice on surgical conditions and abstained from the practice of surgery which was left entirely to the surgeons and barbers. Whereas the physicians had university rank, the surgeons did not. The physicians were regarded as academicians, the surgeons were considered of a lower order who rarely knew Latin — the language of learning.

In England, the barbers formed a religious guild recognised by the Charter of Edward IV in 1461.

In 1540, the barbers and surgeons together were granted a Charter by Henry VIII. This union of barbers and surgeons lasted until 1745, the Royal College of Surgeons of England being founded in 1800.

At the end of the thirteenth century, pharmacies were established in Italy and the Guild of Physicians and Pharmacists were formed. At that time, the pharmacist was still an astrologer and alchemist and magic powers were attributed to him and pharmacy formed as it were the centre of a scientific circle. The physician and the pharmacist worked together and an old Italian illustration shows the pharmacist receiving in his shop patients waiting for the physician who would point with a baton to the drugs to be dispersed to the patient.

In the United Kingdom, the Royal College of Physicians of London was the first institution to be set up. In 1518, "The Charter of Incorporation" was granted by Henry VIII to the President and College, or Commonalty, of the Faculty of Physic in London. It was established in order "to withstand in good time the attempts of the wicked, and to curb the audacity of those wicked men who shall profess medicine more for the sake of their avarice than from the assurance of any good conscience whereby very many inconveniences may ensue to the rude and credulous populace." Many arts and sciences flourished in Europe during the Renaissance period. There were no man-made walls enclosing knowledge as in the case of religion.

### Humanism

In the field of literature, there were two French stories which liberated the human emotion of love from the shackles of tradition and religion. Abelard and Heloise is the story of love between a monk and a nun. In the words of Walter Pater "..... as Abelard and Heloise sat together at home to refine a little further on the nature of abstract ideas Love made himself of the party with them." They have been immortalised in the letters they exchanged and later by Alexander Pope in his poem, "Abelard and Heloise."

Aucassin and Nicolette is the story of Aucassin who falls in love with Nicolette, a beautiful girl of unknown parentage. Their love raises the wrath both of the aristocracy and of the church; both are imprisoned by the secular authorities and he is threatened with the pains of hell by the church. After many adventures, they are united in love.

Both these stories show the conflict between religion and humanism. Walter Pater says that one of the strangest characteristics of the period was its spirit of rebellion or revolt against the magic and religious ideas of the time.

The position of medicine at the end of the 15th century is well stated by Castiglione.

"Western Europe began to understand that, much more than the maxims of the classics, it was the spirit that dictated these maxims that was to be appreciated. It is essentially from this Humanism that arose a free and fertile spirit of criticism that flourished in medicine as in art, together with the desire to see new things and to think with one's own mind instead of bowing meekly before the dogmatic assertions of scholasticism. Humanism, of which Petrarch was a chief prophet, is defined by J.A. Symonds as 'a just perception of the dignity of man as a rational, volitional and sentient being, born upon this earth with a right to use it and enjoy it.' It is in this spirit that the principal factor in the renaissance of medicine is to be found — a revival that was prepared by the Later Middle Ages with those early studies on the cadaver and the beginnings of clinical observation which are characteristic of Humanism."

During the Renaissance, the history of medicine is inextricably bound with the history of the humanities. It was during this period that the greatest artists of all time, Michael Angelo and Leonard da Vinci, who were both highly accomplished students of the Humanities, dissected the human body in order to be able to portray it aright — Da Vinci also described for the first time the anatomy of the broncho pulmonary segments. In 1889, Ewart of the Brompton Hospital redescribed them.

The eighteenth century was characterised by philosophies and systems which resulted in political and social upheavals in Europe. These brought about a positivistic concept of life. Man explored nature and discovered numerous scientific facts embracing a good part of the physical sciences, viz. Physics and Chemistry. Since printing had already become universal, thanks to Gutenberg, reading became common whereas previously only the monks and scholars read. Journals began to multiply. Numerous discoveries were made due to the positivistic concept and these became widely known due to the coming into existence of numerous journals. The physicians substituted literary studies for alchemy, astrology and horoscopy and often acquired a reputation for literature. John Arbuthnot's History of John Bull immortalises the nickname by which the English people have since been known. William MacMichael's story of the Gold Headed Cane, an adornment which was then a conspicuous part of the physician's insignia, passed through many hands, ending with Mathew Baillie whose widow presented it to the Royal College of Physicians of London.

It was only in the first half of the 19th century that medicine began to have a truly scientific basis and the physician lost his semi-miraculous character. Hitherto, he had been working according to the rules of magic and religion. With the growth of the biological sciences, he could experiment and make scientific explorations in the laboratories and in the ward. The pre-clinical and para-clinical sciences came into their own, particularly Anatomy, Physiology and Pathology.

I am not saying that medicine has completely broken off with magic and religion. As the practice of medicine is intimately concerned with the life and aspirations of man, it is inevitable that the progress of medicine will be a part of the progress of man, that is, it will and must reflect the work of man in other fields of knowledge. Therefore, the development of science gave an impetus to the progress of medicine. The credulity of human nature being what it is, medicine still carries with it a considerable proportion of magic and religion from which it is derived.

Meanwhile, the world has been advancing in many fronts of knowledge. The pace seems to be increasing in geometric progression, the speed of advance becoming faster and faster. The public are better and better educated and no longer can "the bedside manner" replace an accurate knowledge of medicine. It is during this century that an almost completely scientifically based medicine has been offered to the public. We are still in the throes of the revolution of modern medical thought.

#### **Progress in medical education during this century**

The beginning of this century saw numerous advances due to the progress of science. Biochemistry, Bacteriology and Immunology have invaded the medical curriculum together with Anatomy, Physiology and Pharmacy. As a result of this, medical education has put on a new face.

The preparatory sciences, viz. Physics, Chemistry, Biology and Mathematics, are dealt with during the last two years of school thereby preparing the student for the study of medicine. The study of medicine after adequate preparation takes about five years.

Part of this time is spent in the Pre-Clinical Sciences, viz. Anatomy, Physiology and Biochemistry. This takes about 18 months and is followed by an introduction to Clinical Medicine and the Para-Clinical Sciences, i.e. Pathology, Bacteriology and Pharmacology.

Various experiments are being made in the teaching of medicine. In the United States, there is a school of medicine which throws the student

into the sea of medicine the day he arrives at the medical school. They start off, for instance, by introducing the student to an expectant mother and make him follow the case through to delivery and then to post-partum care and the care of the infant so that he sees a longitudinal section of medicine. When the medical student has completed his course and passed the final examination, he has to spend one or two years as a houseman in a recognised hospital. Then he has to decide what he would like to do. There are many options open to him. He can decide not to practise medicine at all and take to some other professional activity. To mention a few — Oliver Goldsmith, Anton Chekov, Sir Arthur Conan Doyle and Somerset Maugham. Or he can decide to do one of the Pre-Clinical or Para-Clinical Sciences.

Those who wish to treat the sick must decide whether they wish to be consultants, specialists or general practitioners. Each of these needs further vocational training. During the last few decades, much provision has been made for post-graduate training of consultants and specialists but until 1950, there was no provision for vocational training of general practitioners who were and are and, I am sure, will be the basic structure on which all else will depend.

So a group of like-minded general practitioners got together in the United Kingdom to remedy this defect and established the College of General Practitioners. They had to face much opposition, the most important of which came from the doctors, especially the consultants and specialists who considered that the general practitioners belonged to an inferior race. However, due to the dedication and ability of the general practitioners in the United Kingdom, the college thrived and made a considerable impact on medicine in the United Kingdom. I venture to think that the current of devotion and ability has begun to touch the shores of other countries, rather like the Gulf Stream laves the shores of Britain and ameliorates the climate.

The College of General Practitioners then found suitable accommodation at Prince's Gates London in a building which, interestingly enough, was the house in which Joseph Kennedy, father of the President, lived while he was the Ambassador of the United States. They slowly gained a reputation for maintaining high standards in medicine and some time later, the college received recognition by being called the Royal College of General Practitioners. Then the General Medical Council agreed to recognise the Royal College of General Practitioners and a Fellow or Member of the college may add after his name the letters F.R.C.G.P. or M.R.C.G.P. This means the college can now speak

with authority for the whole profession of general practitioners in the United Kingdom.

**The Humanities**

This brings me to the main point of my philosophy — that is the study of the Humanities. At the Massachusetts Institute of Technology, they told me that an engineer is not a good engineer if he only knows engineering. I teach students that a doctor is not a good doctor if he knows only medicine. Whereas consultants and specialists are interested in the case, the general practitioner is interested in the warm heart that beats within. Macbeth referring to Lady Macbeth asks the doctor,

“How does your patient, doctor?”  
 “Not so sick, my lord,  
 As she is troubled with thick-coming fancies,  
 That keep her from her rest.”  
 “Cure her of that:  
 Canst thou not minister to a mind’s diseases’d,  
 Pluck from the memory a rooted sorrow,  
 Raze out the written troubles of the brain,  
 And with some sweet oblivious antidote  
 Cleanse the stuff’d bosom of that perilous  
 stuff  
 Which weighs upon the heart?”

The general practitioner, above all, must have a knowledge of the humanities because then he will understand the factors involved in the making of the individual man in society and his aspirations and values. It might be considered that it is impossible for a doctor to find time to obtain a fair acquaintanceship with the humanities. On the contrary, some of the best doctors have been well versed in the humanities. To mention just a few names, Sir Thomas Browne of *Religio Medici* fame; Sir William Osler, Lord Brain and Dr. William Pickles, the first President of the Royal College of General Practitioners.

I have had the good fortune of meeting William and Gertrude Pickles. My wife and I were sitting at the same table with them at dinner in Harrogate. I also listened to him when he gave a talk at the Post-Graduate School at Hammersmith. He told us that in the village of 6,000 persons where he worked, he knew everyone and their dogs and cats. The people all confided their secrets to him and even their love affairs. Thus he was able to determine that the incubation period of infective hepatitis was 18 to 35 days — he knew exactly the movements of the people, including the love trysts of the young.

While on the subject of William Pickles, I will tell you a story. Major Greenwood in his

“Epidemics and Crowd Diseases” mentions that Charles Creighton, who was an able statistician, had a poor view of Sir William Jenner. He said Jenner made three mistakes, first that smallpox and cowpox were the same virus — “*Variolae Vaccinae*” (smallpox of cows) being the title of Jenner’s paper. The second was his unproved assumption that vaccination prevents smallpox. The third was an article in which he said that the cuckoo lays its egg in the hedge-sparrow’s nest and the hedge-sparrow hatches the egg. As it grows, it becomes bigger than the hedge-sparrow and ejects the young hedge-sparrows from the nest. Greenwood says that it has subsequently been shown that Jenner was right on all three counts. When I read this, I knew that what Jenner stated regarding the cuckoo and the hedge-sparrow was true because Shakespeare says so and he should know. The Fool says to Lear,

“For you trow, nuncle,  
 The hedge-sparrow fed the cuckoo so long,  
 That it had it head bit off by it young.”

Sometime after I read this book by Greenwood, I saw in the *British Medical Journal* an article in which William Pickles refers to Shakespeare’s knowledge of the egg-laying habits of the cuckoo and makes the same quotation as I have done.

**College of General Practitioners**

This then is our heritage based on the tripod of Magic, Science and Religion, leavened by the spirit of Humanism. It must not be imagined that the practice of modern medicine has wholly eschewed magic and faith which is the basis of religion — a belief in divine intervention as distinct from the working out of logical sequences as in magic and science. This heritage is fully operative only in the case of the general practitioner because he is the only one who has continuing responsibility for the patient and knows the patient, his family and his setting well.

For some time now, it has been felt that a College of General Practitioners should be set up here since there is no vocational training for general practitioners. If a *laissez-faire* attitude is adopted by general practitioners, the standard of general practice will fall considerably and the future of medicine jeopardised.

The functions of the College of General Practitioners would be:—

- 1) To bring about a rise in the standard of general practice by providing vocational training to fit the doctor for his job.
- 2) To hold examinations to indicate



what the standard of general practitioners should be.

3) To provide continuing education for the general practitioner from the time he graduates till the time he ceases to practise medicine.

4) To appoint tutors to do the teaching.

5) To do research on problems facing the general practitioners.

Now what is the difference between a general practitioner and a consultant or specialist? The main difference is the total approach to the human being offered by the general practitioner — he has to look after the sick person and his family. He should, in addition to being their doctor, be "philosopher and friend" to the family. Whereas a consultant or specialist does not have first contact with the sick, the general practitioner does. The former practises cross sectional medicine but the general practitioner carries out longitudinal medicine. It is rather like the difference between Charles Dickens and Charlotte Bronte. Dickens, living in the metropolis, saw millions of people whom he met for a short time only. One does not often realise that in a large city like London, the individual gets lost in the crowd. In Haworth, a village of 8,000 people, the Brontes had considerable opportunity for studying human beings at length. This provided them with an unrivalled depth of understanding of the human being. Dickens described situations, the Brontes described human beings.

The general practitioner is the captain of the ship. He takes advice from various technical officers but the responsibility to keep the bark afloat and to reach its destination is entirely vested in the captain. The personal relations developed between him and his patients provide unrivalled opportunities for a human approach.

Patients are human beings, not numbered cases for the research worker. The doctor-patient relationship, which is characteristic of general practice leads the doctor into the homes of his patients and he begins to understand the human being as a unit of society and therefore the general practitioner is most suitably situated to restore the sick person whole to the community to which he belongs. Similarly, the general practitioner has to go all the way with the sick, unlike consultants and specialists. The Gospel says: "If a man shall ask you to walk with him one mile, thou shall go with him twain." But this is not enough for the general practitioner — he must go all the way, if necessary to the bitter end.

Knowledge is advancing so rapidly that mem-

bers of any of the professions must have continuing education to keep them abreast of modern advances to enable them to give of their best. This is exactly what the college proposes to do. I have said that it is the general practitioner's duty to make a patient whole and return him to the society to the position and status to which he belongs. He has therefore to understand the human being and the society of men in order to render the appropriate service. I venture to think that he can do this best if he studies the humanities as well. It is the avowed purpose of literature to present life and to present it whole. Whereas consultants and specialists see parts of the patient, it is the general practitioners who see him whole. His duty is not just to set a fracture or cure a patient of a fever but to make him whole.

### The future of general practice

There has been much speculation on this account. Some years ago, I asked Sir Derrick Dunlop, then Professor of Therapeutics in Edinburgh and chairman of the Committee on Drugs of the United Kingdom what he thought was the future of general practitioners. He said they would all be members of a Royal College of Physicians. The idea attracted me but on further thinking, I am convinced there must be several branches of clinical medicine: —

1) General practitioners, i.e. in course of time, all general practitioners would have undergone vocational training in general practice and would be Members or Fellows of the College of General Practitioners.

2) Consultants.

3) Specialists.

If the college is to make its imprint on the future of general practice, we must get going now and start attracting the young to the romance which is general practice. We must also tell the children how satisfying general practice can be. Of course, we share medical knowledge with all medical men but the general practitioner is unique in that he goes all the way with the patient from the time he is born till the time he dies. Our subject, in its application, is a branch of Sociology and should be taught as such. We must talk to teachers at the Teachers Training College so that they will be able to inspire the children in their turn. We must also talk to the different age groups each in their language. For this purpose, the talks can be given at three levels: —

a) Primary School

b) Lower Secondary, Grades 7, 8, 9

c) Upper Secondary, Grades 10, 11, 12.

A booklet has been published on the medical profession by the Singapore Medical Association. It is very good for the information it contains but does not touch on the romance of medicine. When I first learned that Wohler had synthesised urea, my heart leapt up because man had pried into the citadel of God and was able to make an organic substance, hitherto an impossible feat. I knew that diabetes was a killing disease and had seen several persons suffer and die. In 1922, Banting and Best discovered insulin — a boon to millions of people. Although much work was being done, especially in Germany, on chemotherapy during the early part of this century, most infective diseases remained incurable and had to be left to nature.

In 1936, there was a boy of 11 who had streptococcal septicemia. He was the son of a friend of my mother's and it so happened that he was admitted to my ward. He was such a nice boy that all the ward staff fell in love with him. The blood grew a pure culture of streptococcus haemolyticus and there was no hope for him at all. I used to do a ward round every night. One day, I saw this boy and I knew he would not survive till the next day and I skipped the ward round that night because I could not bear to see him die. The next night, when I did the ward round, the staff nurse was angry with me and said, "You knew he would die and you did not come. On whose shoulder could I cry since you failed me and failed the boy?" I felt guilty but I am not sure that I would not repeat the performance.

A few months later, para amino benzene sulphonamide was synthesised and put on the market under the name of "Prontosil". Closely following came Sulphapyridine.

When I graduated in 1931, I had a whole ward full of cases of lobar pneumonia and the mortality was 40%. — this was now reduced to less than 5% by the use of sulphapyridine. Then came Penicillin — the Queen of drugs. No wonder when Alexander Fleming visited a village in Spain the people had paved the roads with flowers in anticipation of his visit.

In 1947, I read a paper on pulmonary tuberculosis and the chairman, Dr. Chen Su Lan, in summing up said that pulmonary tuberculosis was still an incurable disease. Immediately afterwards, the advent of streptomycin was announced. Furthermore I was at the Brompton Hospital in London when PAS (para amino Salicylic acid) was first tried and I tasted the mixture of PAS used there. Between the time I graduated and now, numerous discoveries have been made and many patients, who used to die, make a perfect recovery

and carry on a normal life. What can be more gratifying to a doctor than this?

Now for the practice itself. It is heavy work and carries much responsibility but has its consolations. I will illustrate what I mean by giving two examples, in my own life.

Some 25 years ago, I fell down the stairs and broke the neck of the fibula and damaged the common peroneal nerve which winds around it. I was in excruciating pain. Every day, some of my patients came to visit me in the hospital and they all brought some presents, such as fruits, flowers and so on. But one couple thanked me for what I had done for them during the Japanese occupation. They said they were very grateful to me but they were poor and could not afford to give me anything. So they stood there and prayed for me. When they left, I wept — I could not believe that I had done anything to deserve so much. Wordsworth says, "The gratitude of men often leaves me in tears."

On another occasion, I was summoned to see a dying patient at four o'clock in the morning. During the chilly morning drive, I caught a cold and began to sneeze. The devoted wife in the midst of her deep sorrow said: "Poor doctor, you have caught a cold because of us."

We have to invade the medical curriculum. We must persuade the university to create a department of general practice with staff graded in the same way as the other clinical departments except some, if not all the members will do part-time service — because they will have to do general practice in order to teach it. We must carry the philosophy of general practice and its relationship to sociology into the medical faculty and permeate it. The members of this department will hold the same status as the other clinicians and their voice should be heard throughout the university in all its committees.

The Research Committee, which we have established, will introduce ideas and formulate research schemes of organised research. I envisage also that this college will carry out multi-disciplined research in which members of the other professions will take part, like law, sociology and so on because advances are often made at the periphery of disciplines i.e. when two or more disciplinary fields meet.

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# The control of malaria among the Orang Asli in West Malaysia

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## **Introduction**

THERE ARE 53,000 Orang Asli (Aborigines) in West Malaysia belonging to 18 different ethnic groups, the majority with their own distinct language. These ethnic groups form three main communities, the Negritos, the Senoi and the Malayu Asli. Only 3% of the total are Negritos; the Senoi and Malayu Asli are numerically equal. Most Orang Asli are animists by religion. In spite of their different ethnic origins, economically and socially the Orang Asli form a distinct community.

Economically they can be divided into three groups:

- (i) Deep Jungle Nomadic: Only 2% of the Orang Asli are nomadic. They have no settled agriculture. They live on jungle roots supplemented by what they can catch by hunting and fishing.
- (ii) Deep Jungle Settled: They practise shifting cultivation, felling and burning areas of jungle each year and planting cassava, hill rice, millet and

maize. They hunt with blow-pipes, using poisoned darts and also catch animals in traps.

(iii) Jungle Fringe: About half the Orang Asli live in the jungle fringe areas or in settled villages outside the jungle. Most continue to hunt and fish in the jungle and practise shifting cultivation. Many also have smallholdings, rearing hens and goats, and some own rubber trees or coffee plants. Those living near the coast are usually fishermen.

## **Medical treatment for the deep jungle Orang Asli**

Prior to 1955, no special medical service was provided for the Orang Asli and the majority were outside the reach of any medical care. In 1950, many of the deep jungle Orang Asli were resettled by the Government in camps near the jungle fringe. In these camps, there was a very high mortality and morbidity; the mortality rate was 90 per 1,000 per annum compared with a birth rate of 23 per 1,000 per annum.<sup>1</sup> In 1953, the government opened 12 deep jungle forts and the Orang Asli were

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Typical Orang Asli longhouse in the jungle.

allowed to leave the peripheral camps and settle near one of the forts. Medical aid posts were established in these forts and in 1955, two medical officers were appointed with responsibility for the medical care of these Orang Asli.

Since 1960, the medical services to the Orang Asli have undergone great expansion. Now there are 65 jungle medical posts manned by trained medical assistants, each with a helicopter landing zone and a radio transmitter/receiver set. In addition, there are 72 emergency evacuation aid posts with part-time staff similarly equipped with radio and helicopter pad. At Gombak, near Kuala Lumpur, there is an Orang Asli base hospital with accommodation for 400 patients and also the central radio control station. There are six doctors, two dentists, 13 nursing sisters and over 200 auxiliary medical staff working in the Orang Asli medical service. Using this medical organisation, the service

is concentrated on preventive medicine — tuberculosis control, malaria control, mass inoculations with B.C.G., D.P.T. and poliomyelitis vaccines, maternity and child welfare services and health education.

### Early malaria control measures

In October, 1935 a malaria survey was made by Dr. H.M. Nevin<sup>2</sup> at Kampong Ayer Denak, Perak, a lowland Semai community living behind a tin mine. He found in children under 10 years old a spleen and parasite rate both of 35%. A week later, prophylactic treatment with Pamaquine was started and this was given to the children in bi-weekly doses for a number of years. The malaria prevalence in the community was reduced to under 5% (see Table No. 1).

No further malaria control measures among the Orang Asli are recorded until the malaria eradication pilot project in 1961. Four Orang Asli villages in Selangor, with a total population of 245, were included in the malaria eradication pilot project. All the houses in these villages were sprayed with D.D.T. every six months from April 1961 to April 1964 (six cycles) and "Daraclor" was distributed monthly from April 1961 until October 1963. Half of the population took the drug during the first year, rising to 75% taking the drug monthly at the end of the distribution period.<sup>3</sup>

In 1964, funds were obtained through the Malaria Advisory Board to give prophylactic chemotherapy to all Orang Asli. Starting in June 1964, two tablets of "Daraclor" (chloroquine 300mg + pyrimethamine 30mg) has been distributed monthly from all medical posts and travelling dispensaries to as many Orang Asli as possible. Probably about

**TABLE I**  
Control of Malaria in Lowland Orang Asli at Kg Ayer Denak, Perak in 1935-37.

Date	Age	Number examined	Palpable Spleen	Malaria Parasites	F	V	Q	Mixed
10.1935 <sup>a</sup>	Under 10	52	18 (34.6%)	18 (34.6%)	12	3	3	—
10.1935 <sup>a</sup>	10+	66	3 (4.5%)	4 (6.0%)	3	1	0	—
12.1936 <sup>a</sup>	All	69	3 (4.3%)	4 (4.6%)	2	3	0	—
7.1937 <sup>a</sup>	All	117	5 (4.3%)	6 (5.1%)	3	3	0	—
12.1970 <sup>b</sup>	All	152	—	26 (17.1%)	4	18	0	4

a. Dr H.M. Nevin. Plasmaquine (Pamaquine) was given to all schoolchildren from 11.1935; 0.02 Grams twice weekly to children over 3 years and 0.01 Gram twice weekly to children under 3 years.  
b. Col. Francis Cadigan, U.S. Army Research Unit.

50% of the population took the drug in any one month.

**The National Malaria Eradication Programme**

The National Malaria Eradication Programme in West Malaysia was launched in 1967. Spraying was started in Perlis in the north in 1968 and the eradication programme is moving southwards down the peninsula in eight stages.

In 1969, it was agreed that the large expanse of jungle in the north inhabited only by Orang Asli should be treated as a special area in the National Eradication Programme. The jungle area concerned is astride the central mountain range in parts of the states of Perak, Kelantan and Pahang, stretching from the Thai border in the north to the Selangor border in the south; to the west in Perak it reaches the jungle fringe near the Tanjong Malim-Grik road and to the east in Kelantan and Pahang, it reaches the Kuala Lipis-Kuala Krai railway line but excluding the populated Cameron Highlands area (see map).

This 5,000-square mile area is covered by primary jungle broken only by isolated patches of Orang Asli shifting hillside cultivation. It is 300 feet above sea level at the jungle edges, rising over 6,000 feet in the central range. There are 18,000 Orang Asli living in scattered groups, mostly near the river valleys and at heights up to 3,500 feet.

MAP OF WEST MALAYSIA SHOWING THE ORANG ASLI MALARIA CONTROL AREA



Sleeping quarters in the longhouse. Note the spaces in the bamboo wall giving easy passage for mosquitoes.

Individual groups vary in size from two to 300 but most settled areas have populations between 20 and 150. The average population density is under four per square mile.

For the purpose of the malaria control programme, the area was divided into 40 zones each with a population of about 450. Two Orang Asli were recruited and trained to work in each zone. They are responsible for spraying all the houses in their zone with D.D.T. every three months and for the weekly distribution of prophylactic drugs to all the people living in the zone. Chloroquine 300mg and Pyremethamine 30mg is given weekly to everyone over 12 and Chloroquine alone in coated tablets or as syrup to children under 12. Prior to the initial spraying a detailed census of the population was taken. In the distribution of the drugs, the malaria workers are assisted by 56 medical personnel attached to the medical posts in the control area.

The spraying and distribution of drugs was started in nine zones, all in Kelantan, in January, 1970; in a further ten zones, all in Perak, in April 1970, and in 12 zones in Perak and Pahang in July 1970. In October 1970, operations were started in a further four zones in Perak. In the remaining five zones, all lying peripherally in Perak, spraying and drug distribution was started in June 1971.

The two malaria workers in each zone remain in the jungle for periods of three months and during this time take a random 30 thick blood films and also blood films from any Orang Asli with fever (passive case detection). At the end of three months, the workers return to the Orang Asli Hospital, Gombak to collect their pay. The returns of the workers are examined and the workers are interviewed while they are at Gombak, so that any problems can be discussed and the progress

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of the work assessed. There are radio transmitter receiver sets in every jungle zone and there are monthly airdrops by parachute of rations and medicines, so there is no difficulty in communicating with the workers while they are in the jungle and no difficulty in supplying them.

Supervision of these 80 malaria workers is difficult as all are working in isolated jungle terrain. Six malaria inspectors have been trained and are employed making surprise checks on the work of the 80 spraymen. Moving mostly on foot from one zone to another, working in pairs, the inspectors check the houses to see if they have been sprayed properly and whether they agree with the details given in the sprayman's return. The urine of the villagers is tested for Chloroquine with Meyer's reagent to see if those stated to have taken Chloroquine have in fact Chloroquine in their urine. Workers found to have made false returns are replaced by new workers; so far it has been necessary to replace 18 of the original malaria workers. In addition, there is a Peace Corps malaria control worker, a nurse and a doctor who make regular checks on the progress of the malaria control programme in the jungle.

Most valuable are the investigations and checks made by personnel outside the Department of Orang Asli. The United States Army Research Unit at the Institute for Medical Research, under Colonel Francis Cadigan, M.D., have made regular three monthly blood surveys in selected areas and also periodic entomological surveys.

### Problems in implementing the present malaria control programme

At first, there was a little resistance to spraying, as some of the Orang Asli were suspicious or frightened at having their houses sprayed and a few abandoned their houses after they had been sprayed. After overcoming the initial resistance, the majority of Orang Asli are keen to have their houses sprayed. There are now only isolated objections to spraying, usually when there is sickness in a house or where the sprayers have upset a family. According to the sprayers' returns, 92.7% of the houses were sprayed at least three times in 1971 covering 90.6% of the population.

The weekly medication with anti-malarial drugs is a much more difficult undertaking. Many of the children were not used to swallowing tablets and even the coated (Resochin) chloroquine tablets are somewhat bitter. Recently, supplies of Nivoquine syrup have become available. The weekly dose of Chloroquine 300mg + Pyrimethamine 30mg produced giddiness in 10-15% of the adults and in

these people the weekly dose is halved. In most zones, it is physically not possible to reach all the houses each week to distribute the drugs. In some of the higher districts, there is literally one house on each hill and many houses have only one small family living in them; the whole population in the zone is scattered thinly over a large area. Where it is not possible for the malaria workers or one of the medical staff to visit a house each week, a supply of the antimalaria drugs is left with the headman or some responsible person. The Orang Asli make frequent trips into the jungle hunting or fishing and are often away for several days at a time; absence in the jungle is a frequent reason for the weekly drug not to be given.

From the returns submitted by the malaria workers, an average of 68% of the total population of the villages visited take the prophylactic drug; of the remainder roughly two-thirds are away in the jungle and the other third refuse to take the drug. The malaria workers, on an average, give out the medicines themselves to 15% of the population weekly, a further 45% every two weeks and the remainder once a month. In 1972, the total number of malaria workers was increased from 80 to 90; the additional ten men are being used to work in zones where the population is very scattered to improve the weekly drug distribution.

There are a number of extenuating circumstances which were not foreseen and were largely beyond our control. In June 1971, a big terrorist camp was found in one zone in Perak and a large area affecting four zones was placed under a 24-hour curfew lasting several weeks. Spraying and drug distribution was not possible during this period. Many police and troops moved into eight zones following this incident and it is uncertain whether they were all taking prophylactic drugs.

A timber road has been constructed from Lasah, Perak running eastwards through the Perak jungle and across to Kelantan; there has been considerable felling of trees and a number of construction and timber workers have entered the area.

Heavy rain and flooding in December 1970 and again in December 1971 stopped the malaria workers from moving around and drug distribution was severely impeded for three weeks in many areas. A former worker was killed by a tiger in one zone and fear of tigers brought spraying and drug distribution to a standstill in this zone for the last quarter of 1971.

### Results

In the pilot national pre-eradication project in

**TABLE II**  
Malaria Blood Surveys at Kampong Bukit Manchong, Selangor.  
(total population 150)

Date	Total Examined	Total Positive.	Percentage Positive.	F	V	Q	Mixed
1960 <sup>a</sup>	61	41	66%	22	11	2	6
1961 <sup>b</sup>	220	87	38%	44	31	2	10
1962 <sup>b</sup>	350	37	10%	14	22	0	1
1963 <sup>b</sup>	434	29	6.5%	1	27	1	0
1964 <sup>b</sup>	83	3	3.6%				
1967 <sup>c</sup>	98	0	0	0	0	0	0
1.1971	21	1	4.7%	1	0	0	0

(a) R.H. Wharton, A.B.G. Laing and W.H. Cheong, Institute for Medical Research, Kuala Lumpur.  
(b) W.H.O. Malaria pre-eradication team representing the total of 22 surveys in the village.  
(c) F.L. Dunn, C.P. Ramachandrum and L.F. Yap, Institute for Medical Research, Kuala Lumpur.

**TABLE III**  
Malaria Blood Surveys in Selangor Orang Asli before and after Starting Monthly Prophylaxis with Chloroquine 300mg + Pyrimethamine 30mg.

Location	Date	Source	Total Examined	Total Positive	Percent Positive	F	V	Q	Mixed
1960-1963									
Bukit Chiding	8.1963	Eyles	100	30	30%	13	11	3	3
Ulu Lui	10.1960	W.L.&C.	103	57	55%	19	18	16	4
K. Penson	10.1960	W.L.&C.	65	31	48%	14	9	2	6
Sg Lallang	10.1960	W.L.&C.	14	12	86%	0	10	1	1
Bukit Lanjan	11.1960	W.L.&C.	43	15	37%	9	5	0	1
Bukit Legong	11.1960	W.L.&C.	23	11	48%	4	5	0	2
Total			348	156	45%	59	58	22	17
						(19%)*	(2%)*	(7%)*	

March, 1967

All 48 Selangor Orang Asli Villages (Population 3,812)	W.H.O.	1,131	134	11.9%	49	73	6	6
					(4.3%)	(6.5%)	(0.5%)	

Eyles = D.E. Eyles, U.S. Public Health Service, I.M.R., K.L.

W.L. & C. = R.H. Wharton, A.B.G. Laing and W.H. Cheong, I.M.R., K.L.

W.H.O. = W.H.O. Project No 20 Malaysia, Quarterly Field Report, First Quarter, 1967.

\* Mixed infections are included in the percentage rate.

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Selangor, there was an Orang Asli population of 245 in four villages. There was a single smear crude malaria parasite rate of over 50% before the onset of six monthly D.D.T. spraying and monthly distribution of "Daraclor" in 1961; this dropped to 1.7% in March 1964 when spraying and drug distribution had been stopped.<sup>3</sup> In Bukit Manchong, the largest of these villages with a population of 150, the parasite rate dropped from 66% in 1960 to 3.6% in March 1964 at the end of the pilot project (see Table No. 2). Three years later, Dr. F.L. Dunn examined the blood of 65% of the total population of the village and found no malaria<sup>4</sup>. In a small survey in 1971, one positive case was found.

The monthly mass distribution of Chloroquine + Pyrimethamine, started in July 1964, reduced the single smear crude malaria parasite rate from over 30% to about 10% (see Tables Nos 3 and 4). In the deep jungle, the prevalence fell further in the higher communities; in a small community living above 3,000 feet, the prevalence fell from 28% to 4%. In the deep jungle area as a whole, the prevalence of *Plasmodium falciparum* fell from 17% to 3% and *P. malariae* almost disappeared, falling from 9.4% to 0.2%. In contrast, the prevalence of *P. vivax* remained the same at about 5%. Four years later, in 1970, when the monthly distribution of the prophylactic drug had probably lost some momentum as suggested in the slight rise in the *P. falciparum* and *P. malariae* rates, the *P. vivax* rate had fallen to 2.2%. Among the Orang Asli living in Selangor in lowland jungle fringe or coastal swamp communities, the monthly Chloroquine + Pyrimethamine distribution reduced *P. falciparum* from 19% to 5% and also had a significant effect on the *P. vivax* rate which fell from 20% to 6.5%.

Three monthly spraying with D.D.T. and weekly distribution of Chloroquine + Pyrimethamine was started in the greater part of the deep jungle Orang Asli area in 1970; the results are so far inconclusive. The slides examined in 1970 and 1971 (shown in Table No. 5) were taken by the malaria sprayers in 31 of the 40 zones where spraying was started not later than July 1970. Included under 1970 are only those slides taken before the onset of spraying and weekly drug distribution or within three months of the onset.

The samples are biased in that they probably represent the first 30 Orang Asli willing to give blood in each zone; those willing to give blood samples are probably more willing to take their prophylactic drugs. This would suggest that the total malaria parasite rate in the sample might

be lower than in the whole community, but it would not affect the relative prevalence of the different malaria parasites. It is interesting to note that whereas the incidence of *P. falciparum* has fallen from 10% to 1.3%, the incidence of *P. vivax* has remained at approximately 2%.

The results of some of the blood surveys made by Col. Francis Cadigan and his staff in the U.S. Army Research Unit are shown in Table No. 6. Being random unbiased surveys, they give an accurate picture of the malaria prevalence in certain areas. They show the marked seasonal variation in the disease and also suggest an overall fall in the infection rate of *P. falciparum*.

### Discussion

The monthly distribution of Chloroquine + Pyrimethamine on an opportunity basis to Orang Asli, started in 1964, reduced the malaria crude parasite from over 30% to about 10%. *P. malariae* infections previously found in 7-15% of Orang Asli almost disappeared. The reduction of malaria to one-third was of great benefit to the health of the Orang Asli.

The control measures started in 1970, the three monthly spraying with D.D.T. and weekly drug



Spraying with D.D.T. in an Orang Asli house. This house has open sides.



**TABLE IV**  
**Malaria Blood Surveys in deep jungle Orang Asli before and after the administration of monthly prophylaxis with Chloroquine 300mg + Pyrimethamine 30mg. Single smear crude parasite rates. Monthly prophylaxis started in July, 1964.**

Height	Location	JULY, 1963 <sup>1</sup>					APRIL-MAY, 1966. <sup>2</sup>								
		Total Examined	Total Positive	% Positive	F	V	Q	Mixed	Total Examined	Total Positive	% Positive	F	V	Q	Mixed
3,000 Feet +	Ulu Sg Mu, Pk.	25	7	28%	1	1	4	1	27	1	4%	0	1	0	0
1,000 Feet +															
1,000 ft	Kemar Post, Pk	86	29	34%	17	3	6	2	101	6	6%	3	3	0	0
1,000 ft	Chabai Post, Kn	40	16	40%	8	3	5	0	48	6	12%	3	2	0	1
1,200 ft	Kuah Post, Pk	25	9	36%	6	1	2	0	23	1	4%	1	0	0	0
		151	54	36%	31	7	13	2	172	13	8%	7	5	0	1
Under 1,000 Feet															
700 ft	Banding Post, Pk	13	6	46%	4	0	1	1	24	1	4%	0	1	0	0
700 ft	Yai Post, Kn	30	14	47%	6	4	3	1	47	6	13%	0	5	1	0
500 ft	Poi Post, Pk	35	12	34%	6	2	4	0	35	3	9%	2	1	0	0
500 ft	Sg Jenera, Kn	45	12	27%	6	2	4	0	96	15	16%	3	10	0	2
500 ft	Betau Post, Pg	48	10	21%	4	2	3	1	202	25	12%	5	17	1	2
		171	54	32%	26	10	15	3	401	39	9.7%	12	23	1	3
Total all areas		347	115	33%	58	18	32	7				(3%)			(0.2%)
				(17%)								(5.7%)			

1. D.E. Eyles, U.S. Public Health Service.  
 2. H.J. Fredericks, I.M.R., H.L.

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**TABLE V**  
Prevalence of Malaria among Orang Asli in the deep jungle area.

Date	Total Examined	Total Positive	Falciparum	Vivax	Malariae	Mixed	Species Unknown
A. 1970	2,038	268 (13.2%)	200 (9.9%)	46 (2.2%)	11 (0.5%)	8	1
B. 1971	2,076	78 (3.8%)	26 (1.3%)	41 (1.9%)	4 (0.2%)	1	6

A = Slides taken prior to or within three months of start of D.D.T. spraying and weekly prophylaxis with Chloroquine and Pyrimethamine.  
B = Accumulated slides taken throughout 1971 after spraying with D.D.T. and weekly drug distribution for a period of over three months.

prophylaxis with Chloroquine and Pyrimethamine, are aimed at stopping malaria transmission and in this they have so far been unsuccessful. Over 90% of the dwelling houses in the deep jungle area are being sprayed with D.D.T. every three months but it is uncertain how effective this measure is for the following two reasons:—

(1) Most Orang Asli houses are fragile structures raised off the ground on stilts; they are constructed of bamboo with an attap (palm leaf) roof. There is space between the bamboo struts on the floor and often a large space between the top of the walls and the roof. Sometimes one side is left open. Some Orang Asli houses are nothing more than lean-to shelters open all round. The female anopheline mosquito, after feeding, might well prefer to rest on a lush jungle leaf outside the house which is often as easy to reach as the sprayed bamboo wall of the house.



The house of a Negrilo Orang Asli. With only a small sprayed surface area for the mosquito to rest on after feeding, the mosquitoes probably rest outside the house.

(2) The Orang Asli probably spend a third of their nights away from home, hunting, fishing, or at distant cultivation sites when they sleep in temporary shelters either on the ground or in trees.

The main problem in giving the weekly prophylactic drug is one of distribution — people spread thinly over a large hilly terrain who are often away from home. There is also some resistance to taking the drug. It has not been possible suddenly to persuade 18,000 scattered people to take the weekly Chloroquine and Pyrimethamine. The adults have to be educated in the importance of taking the drug, the children have to be taught how to swallow the tablets and the workers have to learn how best to distribute the drug over a large expanse of jungle. All this takes time but the effectiveness of the drug distribution is gradually being increased.

Dr. Ivan Polunin thought that some of the high deep jungle Orang Asli were free from malaria in all groups when he examined them three months after they had been resettled. Malaria was prevalent among the highest groups (over 3,000 feet) in 1963 before the start of monthly prophylaxis. Most of the present 40 deep jungle control zones are centred on river valleys rising from below 1,000 feet to above 3,000 feet, so it is difficult to correlate the blood slides collected with altitude. However, the incidence of malaria now appears to be very low in the higher populations and transmission may have been interrupted in a few groups living over 3,000 feet.

The widespread use of Chloroquine could lead to an increase in the Chloroquine resistant strains. The United States Army Research Unit at the I.M.R. has made a number of surveys in the Orang Asli control area and elsewhere. No increase has been found in the prevalence of Chloroquine resistant *P. falciparum* strains which are present

**TABLE VI**  
Malaria Blood Surveys by the United States Army Research Unit  
in the deep jungle Orang Asli Area.\*

Date	Number of trimonthly spraying cycles	Time on Weekly prophylaxis	Total Slides	Total Positive	Per cent Positive	F	V	Q	Mixed
<b>SHEAN POST, PAHANG (1,600ft)</b>									
March, 1970	0	0	115	25	22%	22	0	3	0
Oct. 1970	1	3/12	136	28	21%	20	5	2	1
Feb. 1971	2	7/12	171	4	2%	4	0	0	0
June. 1971	3	11/12	119	6	5%	4	2	0	0
Nov. 1971	5	16/12	192	34	18%	28	5	0	1
Feb. 1972	6	19/12	257	20	8%	19	1	0	0
<b>SATAH, PAHANG. Jungle Fringe. (430ft)</b>									
Sept. 1970	1	2/12	52	13	25%	8	1	4	0
Nov. 1971	5	16/12	132	19	14%	4	10	2	3
Feb. 1972	6	19/12	130	2	2%	1	0	1	0
<b>KEMAR, PERAK (1,000 ft.)</b>									
March. 1970	0	0	97	9	9%	8	0	1	0
July. 1970	1	3/12	57	6	10%	3	1	1	1
Dec. 1970	2	6/12	36	0	0	0	0	0	0
July. 1971	4	12/12	34	1	3%	1	0	0	0
<b>BATU 7/BATU 14 JALAN PAHANG, TAPAH. Roadside Jungle Fringe. (300-1,200ft)</b>									
Oct. 1970	1	3/12	74	41	55%	20	6	0	15
Nov. 1970	1	4/12	54	23	44%	17	2	0	4
July. 1971	4	12/12	74	9	12%	7	2	0	0

\* Captain R. Andre (Personal Communication).

in about 5% of patients with *P. falciparum* infestions.

Iodised salt is distributed to the Orang Asli in the deep jungle. Attempts are being made to mix Chloroquine with this salt with the idea of using it on trial in a low population high altitude situation where the Orang Asli families are living in isolated hill top houses several miles apart.

Meanwhile, the present intention is to continue with the control programme and attempt to improve its implementation, especially in respect of the weekly prophylactic drug distribution.

**Summary**

Earlier malaria control measures among the Orang Asli are noted. From 1964, an attempt was

## MALARIA CONTROL AMONG ORANG ASLI

made to give monthly prophylaxis with Chloroquine and Pyrimethamine to all Orang Asli. This reduced the prevalence of malaria from over 30% to around 10%. Starting in 1970, three monthly spraying of all houses with D.D.T. and weekly distribution of Chloroquine and Pyrimethamine has been implemented in the large deep jungle area in the north and centre of the Malay peninsula. There has been a further reduction in the prevalence of malaria in this area. The problems of implementing the programme are discussed. The

effectiveness of the D.D.T. spraying is questioned in view of the openness of the walls of the houses and the number of nights that the Orang Asli spend out of their houses.

### Acknowledgements

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# Oral carcinoma in the first three decades of life

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## Summary

SEVENTEEN CASES OF oral carcinoma are reported in persons below the age of 30 years. No case of oral carcinoma was reported in the first decade of life. About 24 per cent of cases occurred in the second decade and 76 per cent in the third decade of life. For the whole group, the male:female (M:F) ratio was 1:1.13.

The author has made the observation that round about the age of 30 years, a watershed seems to appear in the pattern and causes of oral carcinoma, especially squamous cell carcinoma, in the Indians. Below the age of 30 years, unknown carcinogens seem to play the major role in causing oral carcinoma. However, over the age of 30 years, it would appear the carcinogens contained in the betel quid, and especially tobacco, play an increasingly dominant role in causing oral carcinoma. The author also states that a majority of the oral carcinoma cases in West Malaysia are preventible. A preventive programme to be effective over the years must begin with the Tamil schools for they are the greatest potential reservoir of preventible oral cancers in this country.

## Oral Carcinoma in the First Three Decades of Life

West Malaysia has a population of nearly nine

million, consisting of about 50 per cent Malays, 37 per cent Chinese and 11 per cent Indians (Research Paper No. 1). The average life expectancy of the West Malaysian male is 65.8 years and for the female 68.1 years (Research Paper No. 2). On the whole, the country's population is comparatively young. About 70 per cent of the population is below the age of 30 years. Persons in the fourth decade of life form about 10 per cent of the population.

Oral carcinoma appears to be the second commonest cancer (second only to cancer of the cervix uteri) in West Malaysia. Among Indian and Malay males, it occupies first place in the data collected so far (Ungku Omar-Ahmad and Ramanathan, 1968). From time to time, the author noted the reporting of oral carcinoma cases in persons below the age of 30 years. A study of oral carcinoma in this age group is reported. A study of oral carcinoma in the fourth decade of life is recorded elsewhere (Ramanathan, in press, a). A comparative evaluation of these two studies will also be made.

## Materials and Methods

This study is based on data obtained from the files of the Division of Oral Pathology and Oral Medicine, Institute for Medical Research, Kuala Lumpur, and for the years 1967-1970. Only

## ORAL CARCINOMA IN FIRST THREE DECADES OF LIFE

new cases, where the diagnosis had been proven histologically, were included in this study. The term oral carcinoma will be used to mean any malignant tumour of epithelial origin and presenting in the oral cavity.

Malignant oral tumours formed about 33 per cent and oral carcinoma 31 per cent of all specimens received by the division. Between 1967-1970, the division reported in all 753 cases of oral carcinoma. Seventeen cases were reported in persons below the age of 30 years, forming 2.3 per cent of all cases of oral carcinoma (Table 1). Thirty cases were reported in the fourth decade of life, forming 4 per cent of all cases of oral carcinoma. Some of these cases have been reported earlier Ramanathan, 1971; (in press, b)

### General Comments

No case of oral carcinoma was reported in the first decade of life. About 24 per cent of cases occurred in the second decade and 76 per cent in the third decade of life. For the whole group, the male:female (M:F) ratio was 1:1.13. A similar ratio was also recorded for the fourth decade group (M:F = 1:1.14). The morbidity rate for oral carcinoma in descending order was the Chinese male, Chinese female, Indian female, Malay female and the Malay male (Table 2). No case was reported in the Indian male.

### Second Decade

Four cases of oral carcinoma were reported in the second decade of life (Table 1). All the patients were females. The number, however, is too small to make any valid observation.

A 12-year-old Malay girl had a squamous cell carcinoma presenting as an exophytic growth of the left buccal mucosa (Fig. 1). Another Malay girl, age 15 years, had a squamous cell carcinoma which presented as an exophytic growth of the lower lip (Fig. 2). Squamous cell carcinoma formed about 11 per cent of all malignant oral tumours in children in West Malaysia (Ramanathan and Tan, in press, c). Jones (1965), in his Northern Ireland series, recorded two cases of oral carcinoma in children between 1950-1964. It appears oral carcinoma in children is not that extremely rare in West Malaysia for in the annual reports of the Institute for Medical Research, Lewthwaite (1931) reported a case of oral carcinoma in a Malay boy, age 13 years. In the following year, the same author reported a case of carcinoma of the buccal mucosa in a 2-year-old Chinese baby girl.

Perhaps the most remarkable case to be reported in the literature is that described by Frank et al (1936) who described a carcinoma of the tongue in a newborn infant. This was a tumour

TABLE I

AGE GROUP IN YEARS	TYPE	MALAY		CHINESE		INDIAN		TOTAL	%
		M	F	M	F	M	F		
10 — 19	Squamous cell carcinoma	—	2	—	—	—	—	2	50.0
	Malignant pleomorphic adenoma	—	—	—	1	—	—	1	25.0
	Metastatic carcinoma	—	1	—	—	—	—	1	25.0
	23.5%	TOTAL	—	3	—	1	—	—	4
20 — 29	Squamous cell carcinoma	1	1	3	1	—	1	7	53.8
	Adenoid cystic carcinoma	1	—	1	1	—	—	3	23.1
	Mucoepidermoid carcinoma	—	—	1	—	—	—	1	7.7
	Nasopharyngeal carcinoma	—	—	1	—	—	—	1	7.7
	Metastatic choriocarcinoma	—	—	—	1	—	—	1	7.7
	76.5%	TOTAL	2	1	6	3	—	1	13
M : F =		8 : 9						1 : 1.13	

**Distribution of oral carcinoma cases by type, race, sex and age groups.**

Table 2

AGE GROUPS	MALAY		CHINESE		INDIAN	
	M	F	M	F	M	F
0 — 29 YRS.	0.13	0.26	0.53	0.37	—	0.30
30 — 39 YRS.	1.90	1.60	0.61	2.41	15.18	16.67

NOTE: The incidence per 100,000 people is not an annual rate, and these rates are only for comparison with one another.

**Crude morbidity rates for oral carcinoma cases by race, sex and age groups — 1967-70.**

about the size of a pea, discovered when a newly-born baby boy refused to nurse. It was situated on the left side of the tongue at the junction of the posterior and middle-thirds of the tongue. In reporting two cases of oral carcinoma in children recently, Jones (1970) made an exhaustive review of the literature on the subject.

An 18-year-old Chinese female had a malignant pleomorphic adenoma involving the left side of the hard palate. Loke (1967), in reporting 670 cases of salivary gland tumours from data obtained from the Institute for Medical Research, Kuala Lumpur, pointed out that the age of onset for the malignant pleomorphic adenomas showed two peaks. One corresponds to 50 years, which is about 10-20 years greater than the average age for benign pleomorphic adenomas. On the other hand, there are those which occur below the age of 20. It would appear from this that although many of the malignant pleomorphic adenomas arise from a preceding long standing benign pleomorphic adenoma, some of them, in fact, may have been malignant from the outset.

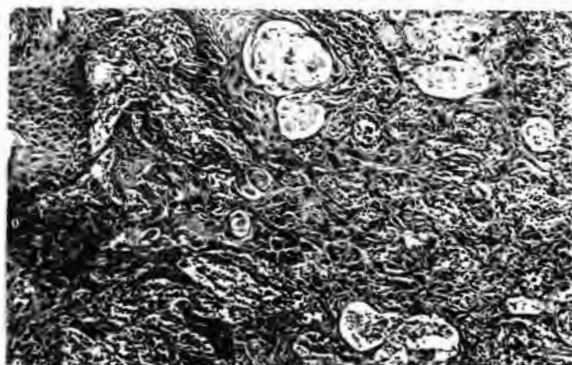


Fig. 1: Photomicrograph shows a squamous cell carcinoma of the left buccal mucosa in a 12-year-old Malay girl. Keratin whorls, pleomorphism of cells and infiltration are evident. (Magnification x 25). H & E.

### Third Decade

About 70 per cent of the cases reported in this age group were Chinese. Squamous cell carcinoma was the commonest carcinoma, forming about 54 per cent. Malignant salivary gland tumours formed about 30 per cent (Table 1).

A 22-year-old Chinese female had metastatic choriocarcinoma involving the palate (Figs. 3,4, 5,6). This case has been reported in detail elsewhere (Ramanathan et al, 1968).

### Carcinoma of the Palate

The commonest site for oral carcinoma was the palate (Table 3). In the palate, malignant salivary gland tumours were the most frequent. Six out of the seven cases were Chinese. Loke (1967) has reported the frequency of palatal involvement by salivary gland tumours is low in West Malaysia (5.5 per cent) when compared with Uganda (19.4 per cent) and South Africa (12.9 per cent). An interesting finding is that 46 per cent of the tumours which arose from the palatal glands are malignant, whereas only 29 per cent of parotid and 21 per cent of submandibular tumours are of this nature.

Adenoid cystic carcinoma (Fig. 7) was the commonest malignant salivary gland tumour to be reported. Loke has commented that these tumours constitute 4.3 per cent of all salivary gland tumours and are most commonly found in the palatal and minor salivary glands. These tumours occur most frequently in the fourth and fifth decades. Loke has also stated that mucoepidermoid carcinoma, which forms about 6 per cent of all salivary gland tumours, has the highest incidence between the second and third decades.

No case of squamous cell carcinoma was reported in the palate or floor of the mouth.

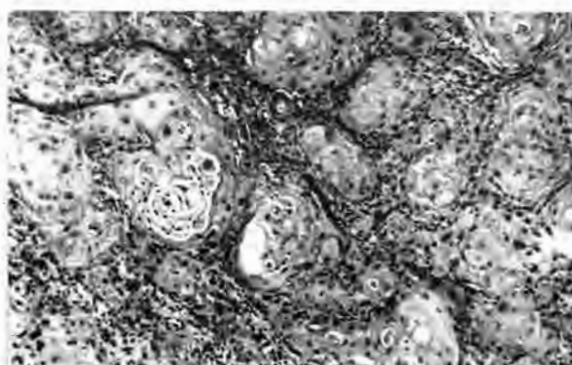


Fig. 2: Photomicrograph shows a squamous cell carcinoma of the lower lip in a 15-year-old Malay girl. Numerous keratin whorls are evident. (Magnification x 25). H & E.

ORAL CARCINOMA IN FIRST THREE DECADES OF LIFE

Table 3

RACE	SEX	TONGUE	GINGIVA	BUCCAL MUCOSA	PALATE	FLOOR OF MOUTH	LIP	MANDIBLE	TOTAL
MALAY	M	—	S.C.C.-1	—	A.C.C.-1	—	—	—	2
	F	S.C.C.-1	—	S.C.C.-1	—	—	S.C.C.-1	M.C.-1	4
CHINESE	M	S.C.C.-3	—	—	N.P.C.-1 M.E.C.-1 A.C.C.-1	—	—	—	6
	F	S.C.C.-1	—	—	M.P.A.-1 A.C.C.-1 M.C.C.-1	—	—	—	4
	M	—	—	—	—	—	—	—	0
INDIAN	F	—	S.C.C.-1	—	—	—	—	—	1
TOTAL		5	2	1	7	—	1	1	17

A.C.C. — Adenoid cystic carcinoma.  
M.P.A. — Malignant pleomorphic adenoma.  
M.C. — Metastatic carcinoma.  
M.C.C. — Metastatic choriocarcinoma.  
M.E.C. — Mucoepidermoid carcinoma.  
N.P.C. — Nasopharyngeal carcinoma.  
S.C.C. — Squamous cell carcinoma.

Distribution by race, sex, type and anatomical site of oral carcinoma cases in the first three decades of life.

**Carcinoma of the Tongue**

The tongue was the commonest site for squamous cell carcinoma (Table 3). Four out of the five patients were Chinese. The five cases formed part of a study of 111 cases of carcinoma of the tongue, i.e. 4.5 per cent. Venables and Craft (1967), in a study based from the records of the Westminster Hospital, London, reported 13 cases under 30 years of age between the years 1925-1966. During this period, a total of 819 cases of carcinoma of the tongue was treated in the department, giving an incidence for this age group of 1.6 per cent. The tongue continued to be the commonest site for squamous cell carcinoma in the fourth decade of life in this country.

**Clinical Features**

Squamous cell carcinoma presented about equally as an exophytic growth (Fig. 8) and as an ulcer with raised indurated margins (Fig. 9) in the first three decades of life. However, in the fourth decade of life, about 65 per cent of the cases presented as an ulcer and 35 per cent of the cases as an exophytic growth. Most of the

malignant salivary gland tumours presented as a firm swelling (Fig. 10).

**Duration of Symptoms**

About 56 per cent of the patients had symptoms for over six months (Table 4). In contrast, about 62 per cent of oral carcinoma cases in the fourth decade of life had symptoms for less than 3 months. There is really a need to consider seriously carcinoma in the differential diagnosis of oral conditions even in the young. Moreover, public education to seek prompt treatment for oral conditions is desirable. Venables and Craft (1967) have also stressed that although carcinoma of the tongue is rare below the age of 30 years, it is important that the medical and dental profession be aware of its existence to enable early treatment, and it is disturbing that the average delay before diagnosis was 5.3 months.

**Observations**

When the studies of oral carcinoma in the first three decades and fourth decade of life are





Fig. 3: A Chinese female, 22 years, with metastatic choriocarcinoma involving the palate.



Fig. 5: Photomicrograph shows neoplastic tissue alongside areas of hemorrhage. (Magnification x 50). H & E.



Fig. 4: Radiograph shows most of the anterior part of the hard palate destroyed and teeth displaced.

evaluated together, the following observations could be made:—

(1) Round about the age of 30 years, a watershed seems to appear in the frequency of types, race and sex incidence, anatomical sites of involvement, clinical features and the causes of oral

Table 4

DURATION	NUMBER OF CASES
Less than 3/12	2
3/12 — 6/12	5
6/12 — 1 yr.	2
1 yr. — 2 yrs.	4
More than 2 yrs.	3
<b>Duration of symptoms.</b>	

carcinoma especially squamous cell carcinoma in the Indians (Table 2). Below the age of 30 years, unknown carcinogens seem to play the major role in causing oral carcinoma. However, over the age of 30 years, it would appear the carcinogens contained in the betel quid and especially tobacco play an increasingly dominant role in causing oral carcinoma. This would explain the approximately 55-fold increase in the incidence of oral carcinoma in Indians in the fourth decade of life.

Many of the Indian patients acquire the habit of chewing the betel quid with tobacco in adolescence or early adult life. Besides the age at which this chewing habit was first acquired, other factors that influence the induction period are the duration of chewing of each quid, the number of quids chewed each day and whether the patient sleeps with the quid in the mouth. If the betel quid with tobacco was kept in the mouth during sleep, the risk of developing oral cancer was as high as 63 times that for non-chewers (Hirayama, 1966). There also appears to be an association between the anatomical site of the oral cancer and the

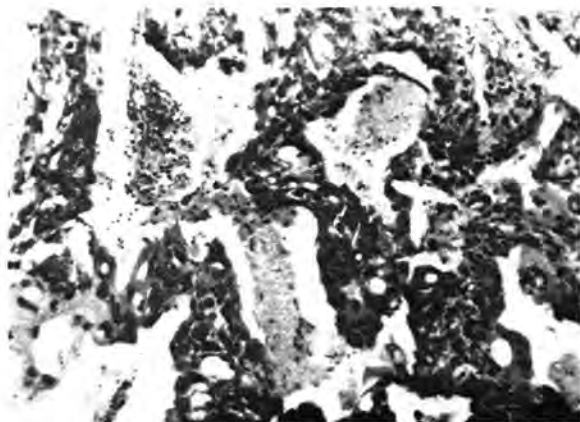


Fig. 6: Photomicrograph shows epithelial cells forming syncytial masses of irregular outline. A few cells resembling Langhans' cells are evident. (Magnification x 120). H & E.

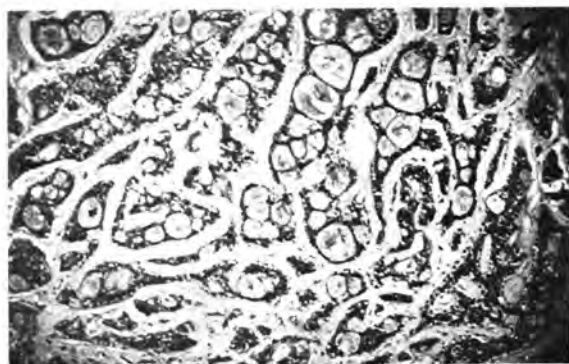


Fig. 7: Photomicrograph shows an adenoid cystic carcinoma consisting of rounded, ovoid or irregularly shaped masses of cells in a rather scanty connective tissue stroma. Numerous cystic or alveolar spaces are present in the cell masses, giving rise to the cribriform effect which is a very characteristic feature of this tumour. (Magnification x 25). H & E.

place where the betel-quid with tobacco was habitually kept.

Similar observations have been made by Marsden (1960) and Wahi et al (1965) in their studies of oral cancer in Indians. Marsden (1960), in a study of 219 cases of oral carcinoma in Indians, reported that oral carcinoma was rare before the age of 30 years. The incidence rises rapidly after 30 years, to a maximum between 50 and 60 years. Wahi et al (1965), in their study of 1,916 cases of oral and oropharyngeal cancers from Uttar Pradesh, North India, also reported that oral carcinoma was uncommon below the age of 30 years. The incidence rate showed an upward trend from 30 years onwards and the peak incidence was between 50 to 54 years of age.



Fig. 8: Squamous cell carcinoma of the tongue presenting as an exophytic growth.

(2) If the habit of chewing the betel quid with tobacco were to be discarded by the Indians, then the incidence of oral carcinoma in them would probably be as low as the incidence in the Malays and Chinese. A majority of the oral carcinoma cases in this country are thus preventable (Ungku Omar-Ahmad and Ramanathan, 1968). Perhaps there is no other cancer in this country for which a preventive programme could be soundly planned and implemented. An increasingly large number of the younger generation of Malays have discarded the habit of chewing the betel-quid. A study of the reasons for this change in social habit will be valuable. A preventive programme to be effective over the years must begin with the Tamil schools for they are the greatest potential reservoir of pre-



Fig. 9: Squamous cell carcinoma of the buccal mucosa presenting as an ulcer with raised indurated margins.



Fig. 10: Malignant salivary gland tumour of the palate presenting as a firm swelling.

ventible oral cancers in this country.

(3) Malignant salivary gland tumours were most commonly reported in the Chinese. The palate was the commonest site of involvement.

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# Antibodies to EBV related antigens in West Malaysian children

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## Introduction

THE EPSTEIN-BARR VIRUS (EBV), a member of the herpes group of viruses, was originally discovered in continuous cultures of lymphoblasts derived from Burkitt lymphoma biopsies (Epstein and Barr, 1964). Transmission of EBV from such carrier cultures to other types of cultured human cells has not as yet been achieved. The virus was detected subsequently also in lymphoblast cultures initiated with peripheral leukocytes of healthy donors or patients with various diseases in many parts of the world.

Antibodies to EB viral capsid antigens (VCA) have been found in the serum of all African patients with Burkitt's lymphoma (Henle and Henle, 1966; Henle, et al., 1969) but also in many healthy control children and adults from all parts of the world. This ubiquitous virus turned out to be the cause of infectious mononucleosis (Henle, et al., 1968).

Antibodies to VCA are acquired, especially under low socioeconomic conditions, often early in life when primary EBV infections remain either silent or cause, as a rule, mild illnesses. In well-to-do segments of the population, seroconversion

is frequently delayed until adolescence or later when primary infections are prone to result in infectious mononucleosis (IM). In West Malaysia, IM has been observed in Caucasians who were nonresidents, but not among Asians (except in 2 Eurasian children of well-to-do background) in spite of an intensive search over many years (Tan, 1967, unpublished). The present investigation was prompted by the possibility that West Malaysians, like E. Africans (Diehl, et al., 1969) acquire EBV infections in subclinical or mild form early in life so that few, if any, are still susceptible to EBV in adolescence, when primary EBV infections take a more severe turn and may cause IM.

## Methods and Materials:

Sera were collected from Malaysian children ranging in age from 1 to 10 years and titrated in the indirect immunofluorescence test for antibodies to VCA (Henle and Henle, 1966) as well as for antibodies to the 2 components, D and R, of the EBV-induced early antigens (EA) complex (Henle, et al., 1971). For anti-VCA titration, acetone-fixed cell smears are prepared from virus-producing Burkitt tumor cell cultures by techniques described (Henle, et al., 1969).

TABLE I

Antibodies to EBV Related Antigens in West Malaysian  
Children aged 1-10 years

Age Group (Yrs.)	No. Tested	Anti-VCA titer			Anti-D	Anti-R
		Negative	Positive		- Positive	Positive
			+1:10	1:10-1:80	+1:160	( 1:10)
1-2	18	3 (16.7) *	12 (66.7)	3 (16.7)	0	1 ( 5.5)
3-4	19	1 ( 5.3)	17 (89.4)	1 ( 5.3)	0	2 (10.6)
5-6	18	1 ( 5.6)	17 (94.4)	0	0	0
7-8	20	2 (10.0)	17 (85.0)	1 ( 5.0)	0	0
9-10	20	0	20 (100)	0	0	0
Total	95	7 ( 7.3)	83 (87.4)	5 ( 5.3)	0	3 ( 3.2)

\* % of age group

For the anti-D and anti-R titrations, smears are prepared from the normally non-virus producing Raji cell line which was experimentally exposed to EBV from a carrier culture 2 to 3 days previously. Under these conditions, an abortive infection of the cells is obtained; that is EA is synthesised but not VCA nor virus particles. These smears are either fixed in acetone, which preserves both the D and R components, or in methanol, which denatures R but not D. The 3 types of cell smears are first overlaid with test serum in various dilutions.

After incubation in a moist chamber for 45 minutes at 37°C and washing, the preparations are overlaid with fluorescein-conjugated antibodies to human immune globulin (anti-IgG) for 45 minutes at 37°C. Following rinsing, drying and mounting, the smears are then examined microscopically under ultraviolet illumination for detection of immunofluorescent cells; that is, cells containing antigen to which antibodies have attached and in turn the fluorescein-conjugated antibodies to human IgG. The last serum dilution yielding detectable, though weak fluorescence of the appropriate number of infected cells (from 5 to 15%) is taken as the titer.

## Results

It is seen from the table that even in the 1-2 year age range, 83% of the children already had antibodies to VCA and in the older age groups, from 90-100% were positive. None of the children had antibodies to the D component of the early antigen complex and 3% to the R component. In IM, about 70% of the patients show a transitory anti-D response. The failure to detect anti-D in the series denotes that none of the children studied had undergone recent primary EBV infections. Anti-R is noted in healthy individuals only when they show relatively high anti-VCA titers, which was the case also in the series. It is suspected that relatively high anti-VCA levels accompanied by low titers of anti-R reflect the extent of the EBV carrier state which becomes established with a high degree of regularity in the lymphoreticular system after primary EBV infections.

## Summary

The data presented explains why IM is not observed in West Malaysians. The vast majority of Malaysian children acquire antibodies to EBV in the first years of life. Thus, few, if any are

## ANTIBODIES TO EBV RELATED ANTIGENS IN CHILDREN

still susceptible when they reach adolescence when IM is the likely result of delayed primary EBV infections.

### Acknowledgements

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# Acropustulosis (Acrodermatitis continua) with resorption of terminal phalanges

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## Introduction:

PUSTULAR ERUPTION of the fingers and toes has been described under various names and various aetiology has been proposed. The term acropustulosis, though merely descriptive, is most suitable till more is known about the pustular eruption of the extremities.

In 1897, Hallopeau gave the name *Acrodermatitis continua* to the disease with symmetrical pustular eruption near the nails and the first patient also had lesions in the mouth. The condition was subdivided into three types according to the extent and the destructive nature of the disease. In 1922, Fisch reported radiographic bone changes in some of his patients with *Acrodermatitis continua*. Since then, others have described the pustular eruption of the extremities as a form of pustular psoriasis even though the characteristic lesion may be absent elsewhere on the body. Barber (1930) distinguished clearly between *Acrodermatitis continua* and pus-

tular psoriasis and our patient has features which are more in favour of the former. To our knowledge, this is probably the first report of a case in Malaysia.

## Case Report

About 25 years ago, a 66-year-old Chinese female developed a rash on the dorsal surface of the left thumb near the base of the nail, gradually spreading proximally. The nail of the affected finger was soon involved and she lost the nail within one year of the onset of the rash. Similar lesions appeared on the remaining fingers of the left hand, the left thenar and hypothenar eminence and the fingers of the right hand, again starting at the tip of the right thumb. In the left foot, the rash developed first on the sole and subsequently the toes were involved. Periods of remission lasting for two or three weeks, with rash clearing completely, were noticed in the initial stages. She is not aware of similar skin disease in the family.

## ACROPUSTULOSIS WITH RESORPTION OF TERMINAL PHALANGES



Fig. 1: Lesions on the tip of the fingers and the palm (left side only).



Fig. 2: Loss of nails with shortenting of the digits.

On examination, the left hand showed glazed erythematous scaly lesion, with collar of pustules at the proximal edge of the lesion, on the terminal phalanx of the thumb, index and middle fingers with shortening in length of these digits and total loss of nails. The thenar and hypothenar eminence of the palm showed an erythematous patch with collar of pustules beneath the thickened scales. The right palm, thumb, index, middle and ring fingers were similarly involved. (Figs 1 and 2). Similar lesions were seen on the toes of left feet with an intact third toe. The right foot and the rest of the body had no rash. Blood count, L.F.T., blood urea, serum calcium, electrolytes, S.G.O.T. and S.G.P.T. and urine were normal. E.S.R. 37mm. L.E. Cells negative. K.T. negative. The pustules were sterile and leprosy was excluded.



Fig. 3: X-rays show the shortening of the phalanges.

A biopsy of the pustular edge of the lesion on the left thenar eminence showed hyperkeratosis, parakeratosis and spongiform pustule just beneath the parakeratotic layer. The pustule consisted of outlines of the epidermal cells forming a sponge-like network with neutrophils interspersed between them. The neutrophils appeared to have originated from the vessels of the dermal papillae. There was acanthosis with elongation of the rete pegs. (Figs. 3 and 4). The X-ray of the hand shows shortening of the terminal phalanges of the thumb, index and middle fingers of both hands. (Fig. 5). X-ray of the feet showed similar changes. The lesion responded well to topical steroid application with polythene occlusion but recurred two months after the treatment was discontinued.

### Discussion

The absence of psoriatic lesion elsewhere and the characteristic loss of nails are suggestive of a

diagnosis of *Acrodermatitis continua*. The lesion on the left palm may resemble psoriasis, but instead of the evenly spread pinhead size pustules typical of psoriasis, subcorneal collection of pus at the periphery of the lesion with stripping of the corneal edge was present. Barber (1930) thought that bony changes were due to osteitis as he isolated *Staphylococcus aureus* from the lesion. Others explained bony changes as due to disuse atrophy. No bacteria was isolated from our patient and she was not inconvenienced by the changes in the fingers. It is probably the inflammatory process of the disease itself which caused the shortening of the fingers (phalanges). Lever (1967) believes that pustular psoriasis and *Acrodermatitis continua* have the same histologic picture. The biopsy showed features of both diseases. However, the sponge like network of the cellular wall of the epidermis with accumulation of neutrophils is diagnostic of *Acro-*





Fig. 4: Microphotograph showing the pustule beneath the hyperkeratotic layer.



Fig. 5: Magnification of Fig. 4. Epidermal cells form a ghost-like network in the pustule.

*dermatitis continua*, according to Barber (1930), whereas in pustular psoriasis the epidermal cells totally disrupt, leaving the cavity filled with neutrophils.

#### Summary

A rare case of acropustulosis (*Acrodermatitis continua*) in an elderly Chinese female is described. The clinical and histological features in favour of

such a diagnosis are discussed. To the lengthening list of differential diagnosis of shortening of digits, *Acrodermatitis continua* must be added.

#### Acknowledgements

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# Cellular and hormonal control in glycogen metabolism — recent advances

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IN ANIMAL TISSUES, an easily available source of energy is the polysaccharide glycogen. It occurs mainly in liver and muscle but is also present in lesser amounts in other tissues, such as the heart, kidney, brain, skin and blood cells. The glycogen molecule is composed of over 120,000 glucosyl units, linked together in such a way that it assumes a "tree-like" appearance. The glucose molecules are joined to one another by an alpha-1, 4-linkage and at the branch points by an alpha-1, 6-linkage. The structure of glycogen, as studied by chemical and enzymic methods, has been reviewed by Manners (1962). Recent studies, using purified enzymes, confirm the multiple branching in the glycogen molecule (Bathgate and Manners, 1966).

The molecular weight of glycogen has been shown to vary from 8,000 to 20 million, depending on the method of extraction, the nutritional state and pathological condition of the tissue from which the glycogen is extracted (French, 1964; Edstrom, 1970). Drochmans and Danten (1968) have postulated that the glycogen molecules aggre-

gate to form large particles ("rosette form") called alpha-particles and these, under acidic conditions, break up into smaller beta-particles. In the cell, the glycogen particles are found usually in the cytoplasm and in the lysosomes. They may also be found in the mitochondria and in the nucleus in certain pathological conditions.

## The Pathways of Glycogen Metabolism

The study of glycogen metabolism in man has been intensive in the last 30 years. It began with Cori, Schmidt and Cori (1939) who showed that glycogen can be synthesised *in vitro* from glucose-1-phosphate by the enzyme phosphorylase. The same enzyme was also shown to be responsible for its degradation. By the early fifties, the enzymic degradation pattern of glycogen had been worked out.

Studies of defects in glycogen metabolism and glycogen storage diseases led to further investigations into alternative pathways for glycogen breakdown and synthesis. Leloir and Cardini (1957) showed that glycogen can be synthesised in tissues

from uridine diphosphate glucose by an enzyme "glycogen synthetase". The study of glycogen storage disease, Type V (McArdle's disease), in which muscle phosphorylase is absent, showed accumulation of glycogen in the muscle (Schmid and Mahler, 1959).

Adrenaline, a hormone which activates the enzyme phosphorylase, increased glycogen breakdown but not its synthesis. Grillo and Ozone (1962) showed that when glycogen in foetal liver was detectable, only glycogen synthetase activity was present while phosphorylase activity was still undetectable at this stage. These findings clearly show that the main pathway for glycogen synthesis *in vivo* is via the action of glycogen synthetase, while phosphorylase remains as one of the enzymes responsible for its degradation. The importance of a non-phosphorolytic pathway for glycogen breakdown in tissues is seen in glycogen storage disease Type II (Pompe's disease) in which there is no lysosomal acid glucosidase present. In this disease, excessive amounts of glycogen accumulate in tissues even though phosphorylase activity is present (Hers, 1963).

#### Glycogen breakdown

The degradation of glycogen in mammalian tissues is catalysed by enzymes which can be classified as either phosphorolytic or non-phosphorolytic. The former consists of the enzyme glycogen phosphorylase which successively cleaves the alpha-1, 4-linkages in the outer chains of the glycogen molecule to produce glucose-1-phosphate (Morgan and Parmeggiani, 1964). Phosphorylases are found in tissues where glycogen is present. Immunologically distinct phosphorylases, which respond differently to metabolites and hormones, have been isolated from muscle and liver tissues. However, phosphorylase is not capable of hydrolysing an alpha-1, 6-linkage or by-passing it. This results in a phosphorylase limit dextrin (Walker and Whelan, 1960).

Some of the side chains at this stage will contain four glucose residues. A transferase enzyme (alpha-1, 4 alpha-1, 4 glucan transferase) transfers a trisaccharide unit from these side chains to another branch, leaving behind a single glucose unit attached by a -1, 6-linkage. Another enzyme, amylo-1, 6-glucosidase, hydrolyses the 1, 6-linkage to produce glucose and through this action exposes more alpha-1, 4-linked glucose residues to further action by the phosphorylase. Thus, phosphorylase, the transferase enzyme and the amylo-1, 6-glucosidase, acting together, can completely degrade glycogen. The glucose-1-phosphate formed is mainly

metabolised by its conversion to glucose-6-phosphate (by the enzyme phosphoglucomutase) or through the uronic acid pathway.

Dietary glycogen is degraded in the digestive tract by non-phosphorolytic pathways (Rutter and Brosemer, 1961). Alpha-amylase attacks glycogen by its random hydrolytic splitting of internal alpha-1, 4-linkages to produce oligosaccharides (mainly maltose and maltotriose) and alpha-limit dextrans, which contain the alpha-1, 6-linkages. Alpha-glucosidases act (possibly at neutral pH) on the oligosaccharides and alpha-limit dextrans to produce glucose. The glycogen present in lysosomes is degraded by an exo-enzyme called acid-alpha-glucosidase, which acts at acid pH, to form glucose. This acid-alpha-glucosidase is believed to be capable of hydrolysing both the 1, 4- and 1, 6-linkages of glycogen (Brown, Jeffrey and Brown, 1969).

#### Glycogen Synthesis

In mammalian tissues, the first step in the synthesis of glycogen from glucose is the phosphorylation of glucose to glucose-6-phosphate by either of the enzymes hexokinase or glucokinase, using ATP as the phosphate donor. The glucose-6-phosphate is an important metabolite. It could be degraded either via the glycolytic pathway or the direct oxidative pathway. Glucose-6-phosphate is on a regulation site of glycogen metabolism. It could be reconverted to free glucose by the enzyme glucose-6-phosphatase or it could be converted to glucose-1-phosphate by the enzyme phosphoglucomutase. The latter is a reversible reaction.

Glucose-1-phosphate also occupies a key position in glycogen metabolism. During glycogen synthesis, it reacts with uridine triphosphate to form uridine diphosphate glucose, the reaction being catalysed by the enzyme uridine diphosphate glucose pyrophosphorylase. The reaction is reversible and the enzyme activity is dependent on magnesium ions. This enzyme, which is found in all tissues where glycogen is synthesised, is inhibited by high concentrations of inorganic phosphate and uridine diphosphate.

In the presence of a "glycogen primer" and the enzyme uridine diphosphate glucose alpha-glucan transglucosylase (glycogen synthetase), glucosyl residues are transferred from uridine diphosphate glucose to the non-reducing ends of the primer resulting in an elongation of the external chains. The additional glucosyl residues are linked to one another by alpha-1, 4-linkages. When the outer chains of the glycogen molecule have each been lengthened by about eight glucose units, a branching enzyme (amylo-1, 4 1, 6-transgluco-

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sidase) acts to remove a segment of the alpha-1, 4-linked chain, consisting of about seven glucose residues, to another part of the glycogen molecule to form an alpha-1, 6-linkage, thus creating a branch point in the molecule. The sequential action of glycogen synthetase and the branching enzyme results in multiple branched "tree-type" glycogen molecule (Manners, 1968).

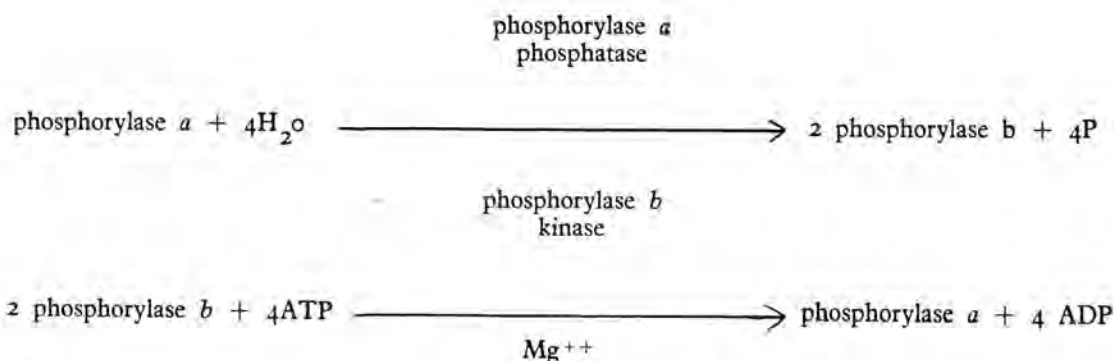
### Activation of Enzymes involved in Glycogen Metabolism

Some of the enzymes involved in glycogen metabolism exist in two forms — an active form and an inactive form. They are interconvertible, either reversibly or irreversibly. These molecular interconversions act as a control mechanism in glycogen synthesis and breakdown. The glycogen synthetase and glycogen phosphorylase activities

are influenced by intracellular and extracellular factors such as metabolites, hormones and ions. The activities of these two enzymes are thought to be primarily responsible for regulating net glycogen turnover.

### Glycogen phosphorylase

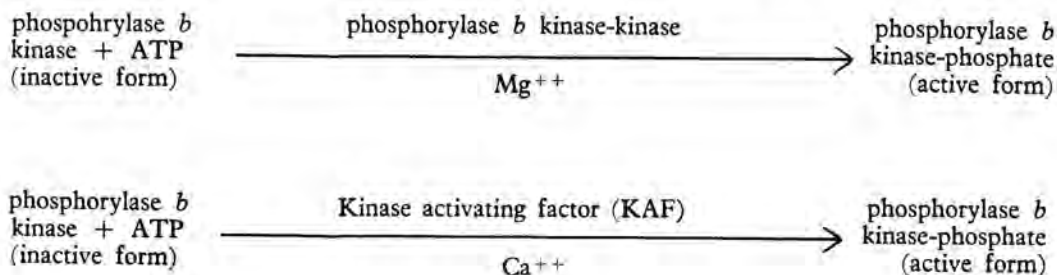
Mammalian muscle glycogen phosphorylase exists in two forms. The more active phosphorylase *a* is a tetramer with a molecular weight of about 370,000 and is active in the absence of AMP. The less active phosphorylase *b* is a dimer with a molecular weight of about 185,000. It is activated by high concentrations of AMP but inhibited by high concentrations of ATP or glucose-6-phosphate. The phosphorylases *a* and *b* are readily interconvertible via a specific phosphatase and a specific kinase (Fischer and Krebs, 1966).



Thus, increased phosphorylase activity can be brought about by either converting the phosphorylase *b*-form to the *a*-form or by activating the phosphorylase *b* by increasing the concentrations of AMP or decreasing the concentration of ATP or glucose-6-phosphate. The *a*-form is predominant in "activated" tissue, such as contracting muscle, and the *b*-form is found in "resting" tissue. The liver and muscle phosphorylases are similar but the liver enzyme is a dimer and no cleavage of the molecule occurs during the conversion of

the 'a'-form to the 'b'-form. Adrenaline increases the conversion of phosphorylase *b* to *a* in liver and muscle and glucagon of that in liver only.

The phosphorylase *b* kinase itself exists in two forms. The inactive form can be converted to the active form by adrenaline or glucagon, in the presence of divalent ions and ATP. The two forms are interconvertible and the activation is brought about by either one of the following reactions (Krebs, et al. 1966; Drummond and Duncan, 1968).



It is believed that the former mechanism is under hormonal control while the latter is under neural control (Shimazu and Anakawa, 1968). The activation can also be brought about by limited digestion with trypsin. The inactivation of the phosphorylase *b* kinase has not been fully investigated.

Cyclic 3, 5-AMP plays an important role in

glycogen metabolism, particularly in its activation of the kinases. It is produced from ATP by the action of the enzyme adenylyl cyclase.

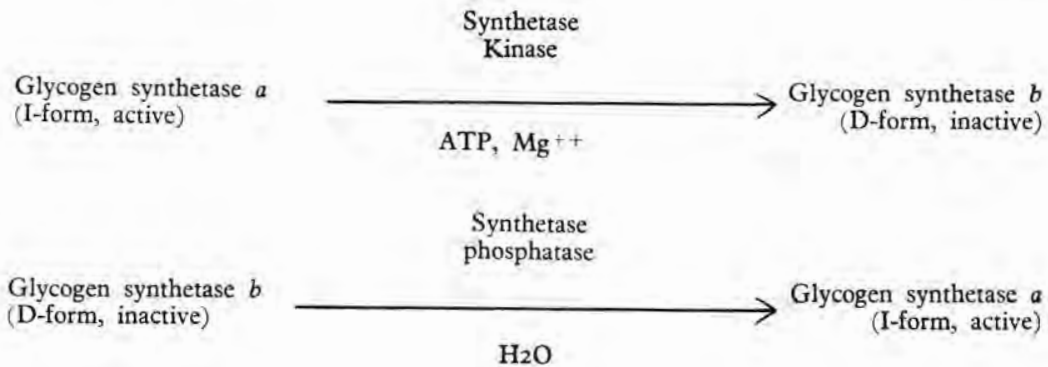
This enzyme is activated by adrenaline and glucagon (Fig. 1). The increase in glycogen phosphorylase activity is due to the increase in cyclic 3, 5-AMP concentrations in tissues (Sutherland and Robison, 1966).



**Glycogen synthetase**

Glycogen synthetase (UDPG-alpha-glucan transglucosylase) exists in two forms in tissues where

glycogen synthesis takes place. They are interconvertible by phosphorylation and dephosphorylation as shown below. (Larner et al. 1968).



The D-form of the enzyme in liver (phosphosynthetase) requires glucose-6-phosphate for its activity while the I-form (dephosphosynthetase) is independent of glucose-6-phosphate for its activity. The D-form is completely inhibited by physiological concentrations of inorganic phosphate, whereas the I-form is nearly fully active under the same conditions (Mersmann and Segal 1967). One form is therefore active and the other inactive *in vivo* whatever the concentration of glucose-6-phosphate.

The conversion of the I-form (active) to the D-form (inactive) can also be brought about by either a kinase activating factor (KAF) which is a calcium-activated proteolytic enzyme or by a proteolytic enzyme like trypsin (Appleman et al. 1964). In the latter two cases, the D-form of the enzyme cannot be reconverted to the I-form. Adrenaline and glucagon, which increase the cyclic 3,5-AMP concentration in tissues, activate the glycogen synthetase kinase. Other cyclic 3,5-nucleotides also have the same effect (Wallas et al. 1968).

In normal tissues, the glycogen synthetase exists predominantly as the inactive or *b*-form and only a small amount of active or *a*-form is present (De Wulf et al. 1968). In hyperglycemia the *b*-form is converted to the *a*-form (Buschiazzo et al. 1970). The *b*-form of the enzyme has a low affinity for UDPG and glucose-6-phosphate and is only active in the presence of high concentrations of glucose-6-phosphate. The *a*-form, on the other hand, has

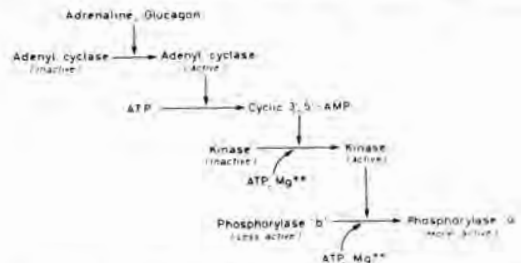


Fig 1 THE STEPS INVOLVED IN THE ACTIVATION OF PHOSPHORYLASE BY ADRENALINE OR GLUCAGON

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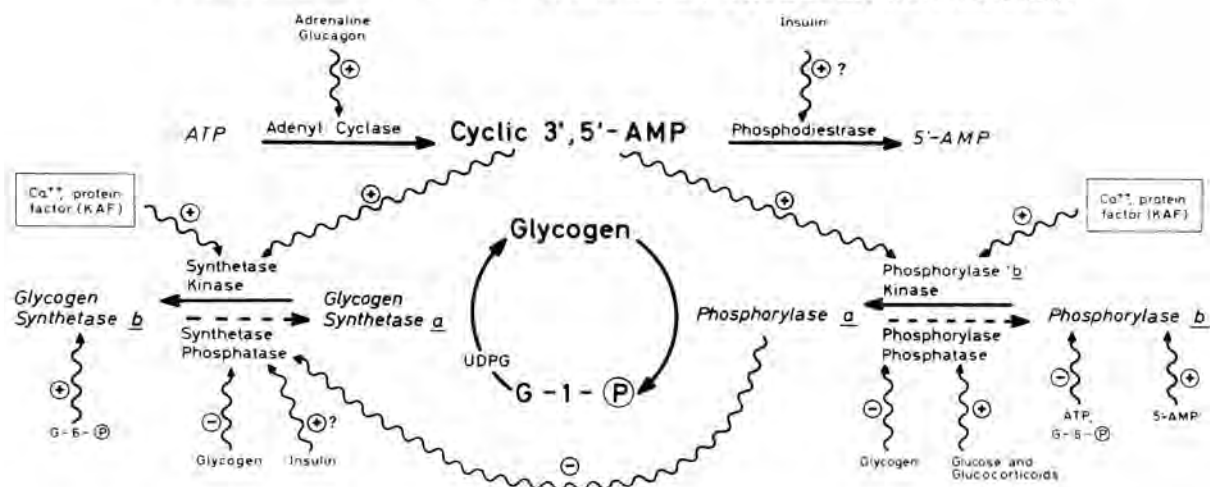


Fig 2 Influence of cyclic AMP and other regulators on glycogen synthesis and breakdown.

⊕ Indicates activation ⊖ Indicates inhibition → Indicates the effect of kinases ---→ Indicates the effect of phosphatases

a high affinity for UDPG and glucose-6-phosphate. High concentrations of ATP (and possibly other nucleotides) inhibit the activities of both the *a* and *b* forms of the synthetase by competing for the UDPG. This inhibition can be reversed by glucose-6-phosphate and magnesium ions (Gold, 1970).

### Regulation of Enzymes Involved in Glycogen Synthesis and Breakdown

The glycogen stored in the liver is used as a reserve of glucose for the blood while muscle glycogen is a glycolytic fuel for the supply of ATP in anaerobic conditions. It is not surprising, therefore, to find the metabolism of liver glycogen tightly regulated by the level of glycemia and by several hormones according to the general demand while that of muscle glycogen is much more under the control of local factors. While the active form of glycogen synthetase is the dephosphorylated form, that of glycogen phosphorylase is the phosphorylated form. Most of the factors which influence the activation of glycogen synthetase also have a profound effect on the inactivation of glycogen phosphorylase. Although the mechanism of regulation by metabolites and hormones may be independent of one another, a balance is always maintained.

### Effect of Glucose and Glycogen

The concentration of glucose in the blood has been shown to control both the degradation and synthesis of glycogen in the liver. The increase in

the rate of glycogen synthesis due to glucose is not the result of an increase in the concentration of intermediary metabolites in the metabolic pathway leading to glycogen synthesis. On the contrary, there is a decrease in the concentration of UDPG and glucose-6-phosphate. The effect is due to a conversion of the synthetase into its active form (De Wulf & Hers 1967).

When a glucose load is given intravenously, the rate of glycogen synthesis starts to increase only after a short latency, indicating that the effect of glucose on the activity of the synthetase is indirect. As this effect has been obtained in animals made diabetic by the administration of anti-insulin serum, it seems not to be mediated by insulin (Hers et al. 1970). The specific stimulation of liver glycogen phosphorylase phosphatase by glucose *in vitro* has been observed by Stalmans et al. (1970). This observation could very well explain the *in vivo* lowering of liver glycogen phosphorylase activity in animals treated with glucose (De Wulf & Hers 1968).

Phosphorylase *a* has also been shown to be a powerful inhibitor of glycogen synthetase phosphatase (Stalmans et al. 1971). Phosphorylase *b* is much less inhibitory. The activation *in vivo* of glycogen synthetase by glucose is therefore explained by the increased activity of phosphorylase phosphatase. Once phosphorylase is inactivated, the synthetase phosphatase now released from inhibition can activate glycogen synthetase.

Hyperglycemia can, therefore, bring about re-

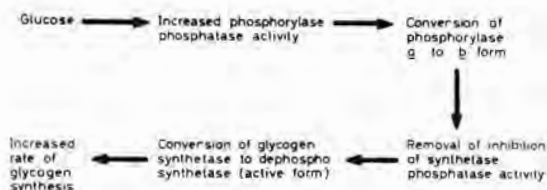


Fig. 3 Effect of glucose on Glycogen synthesis

duced glycogenolysis and increased glycogenesis — an effect not mediated by insulin.

The effect of glycogen concentration on the rate of glycogen synthesis has not been well investigated. Lerner (1967) has explained the inverse relationship between glycogen content in the muscle and the percentage of synthetase in the active form on the basis of inhibition of synthetase phosphatase by glycogen. This could again be an indirect effect exerted through the action of glycogen on phosphorylase phosphatase which has been shown to be inhibited by glycogen *in vitro* (De Wulf et al. 1970).

### The Effect of Hormones

The role played by hormones in the regulation of glycogen metabolism is also interesting. Insulin, when given together with glucose, has been shown to cause glycogen deposition in the liver. This effect has been attributed to an activation of glycogen synthetase (Bishop & Lerner 1967). Insulin alone, however, does not induce an activation of glycogen synthetase but it has been shown that the synthesis of the inducible enzyme glucokinase is dependent on insulin (Salas et al. 1963). Is it also likely that insulin may activate the phosphodiesterase and thereby regulate the amount of cyclic 3,5-AMP present within the cells? A reduction in the amount of cyclic AMP would cause both an increase in the level of glycogen synthetase *a* and a decrease in that of phosphorylase *a*, resulting in increased glycogen production. At the present time however, it is not known for certain how insulin might influence any of the regulatory mechanisms.

The action of the hormones, which are antagonistic to insulin, namely adrenaline and glucagon, has been well studied. These hormones are known to affect glycogen metabolism by changes in tissue concentration of cyclic 3,5-AMP. The levels of active phosphorylase and of active synthetase are controlled by the opposing effects of the kinases and phosphatases. In muscle, and probably in liver, the same protein kinase acts as a phosphorylase kinase-kinase and as a synthetase kinase.

This protein kinase is cyclic AMP dependent

and its action inhibits glycogen synthesis and promotes glycogenolysis. This would lead to hyperglycemia which, in turn, would start a series of changes via phosphorylase phosphatase, phosphorylase *a* and synthetase phosphatase to bring about increased glycogen synthesis and lowered glycogenolysis. The actual amounts of active phosphorylase or active synthetase in a tissue is the result of a balance between phosphorylation and dephosphorylation. At normal levels of glycemia, the synthetase is almost entirely in the inactive form and can be activated by glucose within a few minutes or by glucocorticoids within a few hours. In the latter case, the effect is produced by increased *de novo* synthesis of the phosphorylase phosphatase enzyme.

The action of the glycogen metabolism regulators on the kinases and phosphatases in maintaining the regulation are strikingly similar. It should be noted that the phosphorylase kinase is an allosteric protein and the mechanism of the regulation could be due to the allosteric properties of the enzyme (Madsen, 1964). Black and Wang (1968) have described a mechanism whereby the activation of the phosphorylase *b* is due to a two-stage allosteric transition of the enzyme protein, involving the affinity of the enzyme to its substrate and its catalytic efficiency.

### Other Enzymes, Hormones and Tissue Differences involved in the Regulation of Glycogen Metabolism

Other enzymes also take part in the regulation of glycogen metabolism. The relatively irreversible action of phosphofructokinase in converting fructose-6-phosphate to fructose 1,6-diphosphate has long been recognised as a regulatory mechanism. This enzyme is strongly inhibited allosterically by high concentrations of ATP, thereby preventing further production of this nucleotide by glycogen breakdown.

Hormones, such as ACTH, the adrenocorticosteroids and thyroid hormone, all of which promote glycogen breakdown, may affect glycogen metabolism by either destroying insulin or by producing different end organ responses. Hormonal effects also vary from one tissue to another. Glucagon, a well-known example, has an effect on liver phosphorylase but has little or no effect on muscle phosphorylase.

Finally, it should be realised that the pattern of glycogen metabolism may itself vary in the different tissues. Aduoury (1969) has shown that in fasting animals, there was an increase in cardiac muscle glycogen while the glycogen content in skeletal muscle remained constant. In skeletal mus-

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cle, there was a decrease in phosphorylase activity on fasting while the glycogen synthetase and other regulators were unaffected. The only change in cardiac muscle at fasting was an increase in the D-form of glycogen synthetase.

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# Some radiological observations on the practice of insertion of 'charm needles'

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## Material

A NOT UNCOMMON PRACTICE in Malaysia is the insertion of "charm needles" into soft tissue in various parts of the body. These are easily demonstrated radiologically, but may cause difficulty in interpretation to those unaware of the procedure.

Fourteen cases were discovered in the Department of Radiology, University Hospital, Malaya, in the course of routine reporting over a period of 18 months. A further 2 cases have been added to this small series from the Radiology Department of the District Hospital, Alor Star. There were 13 women and 3 men in the series. The patients included representatives of the three major groups in the country, Malay, Chinese and Indian. In our series, cases were drawn from all social grades, from wealthy housewives to labourers.

A number were questioned as to why they had the needles inserted. The most common belief was that the needles made the patient more radiant and attractive to the opposite sex — hence the term "charm". Some believed the procedure to have a medicinal or curative effect for certain diseases. A few considered that it conferred exceptional physical strength.

## For "Charm" and "Beautification" Purposes

The favourite sites of insertion are the subcutaneous tissues of the cheeks and mons pubis (Fig. 1). There is no particular pattern of needle arrangement and they usually lie at random in the subcutaneous fat and fascial planes, though the distribution of the needles is usually median and/or



Fig. 1

Shows numerous needles embedded in the pubic region.



Fig. 2

Illustrates the symmetrical distribution of the implanted needles in each breast.

symmetrical. A good example is the patient in Fig. 2 in whom 15 needles have been embedded into each breast. Fig. 3 shows the frontal view of the chest of a patient who was being treated in the hospital medical clinic for mitral stenosis.

The needle has been implanted in the subcutaneous tissues over the dorsal spine in order to enhance his physical attraction.

#### For "Medicinal" Purposes

The belief is widely held that the needles can relieve headache, aches and pains in joints or in the back or abdomen. The patient in Fig. 4 attended the Ear, Nose and Throat clinic because of nasal discharge and headache. The occipito-frontal view of the paranasal sinuses showed evidence of frontal sinusitis. According to the patient, the single needle had been implanted in his forehead to relieve his headache but had not proved very effective.

Complications are rarely encountered. The patient in Fig. 1 developed haematuria soon after the needles were inserted. This was probably coincidental, though it is possible that one of the needles had penetrated the urethra or bladder. This was never proven for the patient failed to return

for further investigation. A potential danger would seem to be the possibility of a needle migrating into a vein to lodge finally in some vital organ.

#### Discussion

A common error is to misinterpret the relatively thick charm needles as acupuncture needles. The needles used for "charm" and "medicinal" purposes are usually gramophone needles, and this was confirmed by one of the authors who visited the local medicine man, popularly known as the "bomoh". Needles used in acupuncture are longer and finer and acupuncturists do not leave the needles in the subcutaneous tissues except by accident should one fracture.

#### Acknowledgements

We wish to thank Dr. A .H. Ang for his suggestions and Dr. Hj. Ahmad b. Hj. Othman for providing the X-rays for figures 1 and 2. We are grateful to Miss Janet Low for her secretarial assistance and the Medical Illustrations Department for preparation of the figures.



Fig. 3

A single needle in the subcutaneous area of the back (arrow), an incidental finding in a patient with mitral stenosis. Note left atrial enlargement.

#### Abstract

In Malaysia, it is not uncommon practice among "medicine men" to insert metallic needles into the subcutaneous tissues of the body. Radiological appearances are illustrated. The reasons for this



Fig. 4

Single metallic needle seen overlying the frontal sinuses.

practice amongst the West Malaysians are briefly discussed.

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# Acute appendicitis in West Malaysia

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A STUDY OF 292 consecutive, unselected cases of acute appendicitis was made with particular emphasis as regards its early diagnosis and treatment. The aetiology and symptomatology are reviewed. The results show that the traditional methods of diagnosis are outdated. A line of management is proposed.

Acute appendicitis is now the commonest acute abdominal emergency in West Malaysia and nearly 25% of cases come into hospital with perforation of the appendix. A study of 292 consecutive, unselected cases was conducted with the view to establishing early diagnosis and treatment. The survey was carried out by a group of registrars and medical officers under the supervision of the senior author to establish uniformity of clinical findings. These 292 cases were admitted to the General Hospital, Seremban, West Malaysia.

## Materials and Methods

### Race Distribution

Figure 1 shows the racial composition of the patients whilst Figure 2 denotes the racial distri-

bution of West Malaysia. It can be seen that there were 67 Malays (23%), 130 Chinese (44.5%) and 95 Indians (32.5%) amongst the 292 patients.

Since the population in West Malaysia comprises nearly 50% Malays, 40% Chinese, 9% Indians and 1% other races, acute appendicitis therefore, is far commoner amongst Chinese and Indians than amongst Malays. This is so even when we consider that a smaller percentage of Malays seek treatment by Western medicine in hospital.

### Age and Sex Distribution

Figure 3 denotes the age distribution in males. The commonest age group was between 10 to 20 years, the next commonest being between 20 to 30 years. The youngest male patient was 4 years old and the oldest male 52 years old.

Figure 4 shows the age distribution among the females. As in the male group, the commonest age group was between 10 to 20 years, the second commonest age group being 20 to 30 years. The youngest female patient was 3 years old, the oldest female 58 years old.

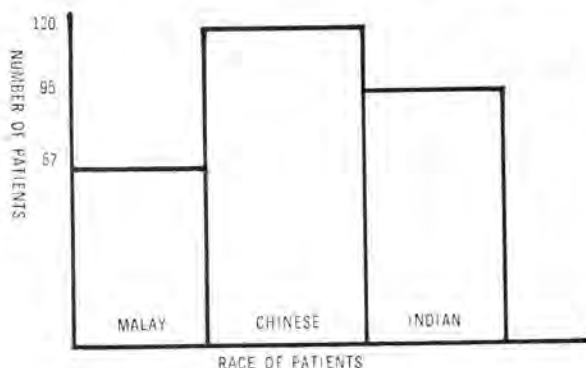


FIGURE 1: RACIAL DISTRIBUTION OF PATIENTS

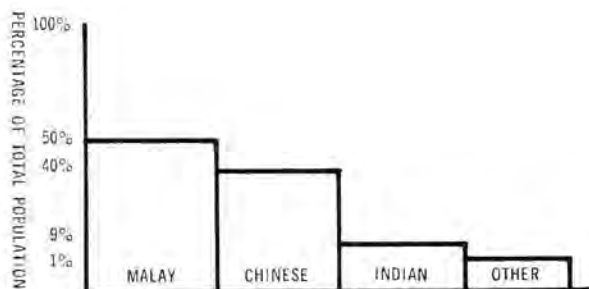


FIGURE 2: RACIAL DISTRIBUTION IN WEST MALAYSIA

There were 136 male patients and 156 female patients. This represented a male to female ratio of 1 to 1.15. There were slightly more female than male patients.

**Pain**

All patients complained of abdominal pain, which was either colicky or constant in nature. In 170 cases (58.2%), the pain originated in the epigastrium, the umbilical or peri-umbilical area and radiated to the right iliac fossa. In 102 patients, (35%), the pain was localised only to the right iliac fossa. In 20 cases (6.8%), the pain originated elsewhere in the abdomen, such as the supra-pubic region, the right upper quadrant of the abdomen or the right loin and then radiated to the right iliac fossa.

**Tenderness on Deep Palpation**

In every single case of this series of 292 patients, there was tenderness on deep palpation of the right iliac fossa. When in doubt about the diagnosis of acute appendicitis, tenderness on deep palpation in the right iliac fossa was regarded by the authors as the single most important factor which made urgent operation for appendicitis imperative.

**Case Report**

A 12-year-old Chinese girl was admitted to the ward with a two days' history of vague generalised abdominal pain. There was no nausea or vomiting. Her bowel actions were normal. The temperature and pulse were not elevated. The total white cell count of the blood was within normal limits. On examination, she was not toxic but her tongue was slightly coated. The abdomen was soft, with no guarding, rigidity or rebound tenderness. However, deep palpation of the right iliac fossa revealed

definite tenderness. On rectal examination, no mass or tenderness was felt. Appendicectomy was immediately done. The appendix was lying retrocaecally and was acutely inflamed with early gangrene at its tip. She made an uneventful recovery following the operation.

**Vomiting and Nausea**

These were present either singly or together. Some patients were nauseated only but did not vomit whilst others felt nauseated and then vomited. These symptoms were present in 98 patients (33.5%) of the cases.

**Fever**

Seventy-three cases (25%) had fever. This was usually in the region of 99°F to 101°F. A significant feature of the fever was that quite often it subsided within an hour or two of admission to the ward and subsequent bed-rest.

**Diarrhoea and Constipation**

Twenty-three patients (7.8%) stated that they had diarrhoea in the preceding 1 or 2 days prior to admission to hospital. Constipation was a much more frequent complaint and was present in 42 cases (14%).

**Tachycardia**

One hundred and ninety two cases (65.4%), on admission to the ward, had a raised pulse rate. Tachycardia was present in all those cases which were febrile.

**Tongue and Breath**

The tongue was coated or furred and the breath was foul smelling in 201 cases (69%). These complaints were more pronounced in those patients with pyrexia.

## ACUTE APPENDICITIS IN WEST MALAYSIA

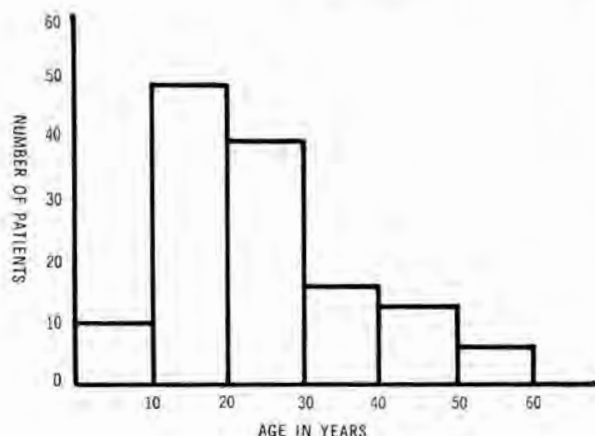


FIGURE 3: AGE DISTRIBUTION IN MALES

### Rectal Examination

Per rectal examination revealed tenderness in 205 (70%) of the cases (Table 2). Of these 205 cases, the tenderness was on the right side in 164 cases, anteriorly in 33 cases and all around the rectum in 8 cases.

### Urine

Only 11 cases (3.6%) had urinary symptoms, frequency and pain on micturition. Three cases showed pus cells and red cells in the urine. In these 11 cases, the appendix at operation was found to be inflamed and lying close to or on the lower end of the right ureter.

### White Cell and Differential Count

The number of white cells in the blood was raised in 32 cases (11%) with a predominantly polymorph leucocytosis. There was no correlation between the degree of leucocytosis and the severity of the appendicular inflammation as seen at operation.

### Rebound Tenderness (Blumberg's Sign)

This is an acute discomfort felt by the patient on sudden removal of the examining hand after pressure on the anterior abdominal wall (Shepherd, 1960). In only 52 cases (17.8%) was this sign positive.

### Rovsing's Sign

Rovsing's sign is positive when pain is felt in the right iliac fossa by pressure on the left iliac fossa (Shepherd, 1960). Only 2 cases (0.7%) showed this sign.

### Diagnostic Error

The clinical pre-operative diagnosis of acute appendicitis was confirmed or otherwise by examination of the appendix obtained at appendicectomy. In 14 out of the total of 292 cases, the appendix was found to be normal at operation. This represented a diagnostic error of 4.8%.

### Discussion

It is apparent from Figures 1 and 2 that, although the Malays form the largest racial group (50%) in multi-racial West Malaysia, the incidence of acute appendicitis is lowest amongst them. In West Malaysia, the Malays are the most under-developed economically of the three major races. As a result, the Malays eat more vegetables and other plant products which are relatively inexpensive. Thus their intake of cellulose is high. For the same economic reasons, the Malays are able to eat lesser amounts of meat than the other races since meat is expensive in West Malaysia. This conforms well with the experiences of Burkitt who has reviewed the incidence of acute appendicitis in both the rural and urban populations of Africa (Burkitt, 1971). In the rural areas of Africa, where the people have a high intake of cellulose, the incidence of acute appendicitis is very much lower than in urban Africans who consume less cellulose. It was Short who wrote as long as 1920 that the main cause of acute appendicitis was the removal of much of the cellulose content of the diet (Short, 1920).

It is also postulated that increased meat consumption runs parallel with an increased incidence

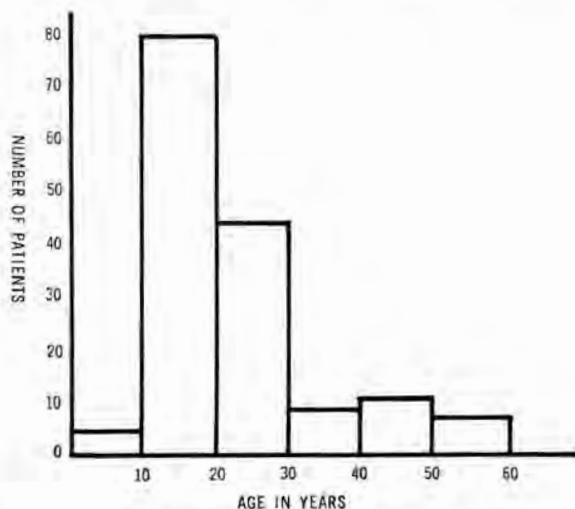


FIGURE 4: AGE DISTRIBUTION IN FEMALES

Site of Pain	Number of Cases
Epigastrium or umbilical area or peri-umbilical area with radiation to right iliac fossa	170 (58.2%)
Right iliac fossa only	102 (35%)
Other areas of abdomen	20 (6.8%)

Normal	87 (30%)
Pain on right wall	164
Pain on anterior wall	33
Pain all round rectum	8
<b>TOTAL</b>	<b>205 (70%)</b>

of appendicitis (Wilkie, 1914), (Williams, 1910). This idea is supported by our figures which show that the Chinese and Indians, who eat much more meat, have a higher incidence of acute appendicitis than the Malays who eat far less meat.

The age distribution of our patients with acute appendicitis generally conforms with that of Western statistics (Shepherd, 1960) in that most of our patients are in the second and third decades of life.

Regarding the sex incidence, Western figures show a slight preponderance of males (Shepherd, 1960). In our Malaysian patients, it is reversed, with a slight female preponderance in the ratio of 1.15 to 1.

Figure 5 shows the relative frequency of the various signs and symptoms and positive tests. The only really consistently significant findings which were elicited were pain and tenderness. These were present in all our cases. The classical complaint of pain, which originated in the epigastrium, umbilical or peri-umbilical area radiating to the right iliac fossa, was present in only 58.2% of our cases (Table 1). We especially relied in tenderness on deep palpation of the right iliac fossa. When this sign was present, there was no hesitation in making the diagnosis of acute appendicitis and deciding on urgent operation.

Our cases were all operated upon within 6 hours of admission to the ward. In this large series of 292 consecutive unselected cases, there was not a single mortality. This is gratifying to note since even today acute appendicitis and appendicectomy carries a definite, albeit small, mortality.

The next commonest findings were tachycardia, coated tongue and foul breath and per rectal tenderness (Figure 5). Surprisingly, in our series, fever was only present in 25% of cases.

Only 0.7% of our cases showed a positive Rovsing's Sign. This coincides with the observation of Davey (1956) who could find a positive Rovsing's Sign in only 5 cases out of 303 patients with acute appendicitis. Indeed, it is clear that undue

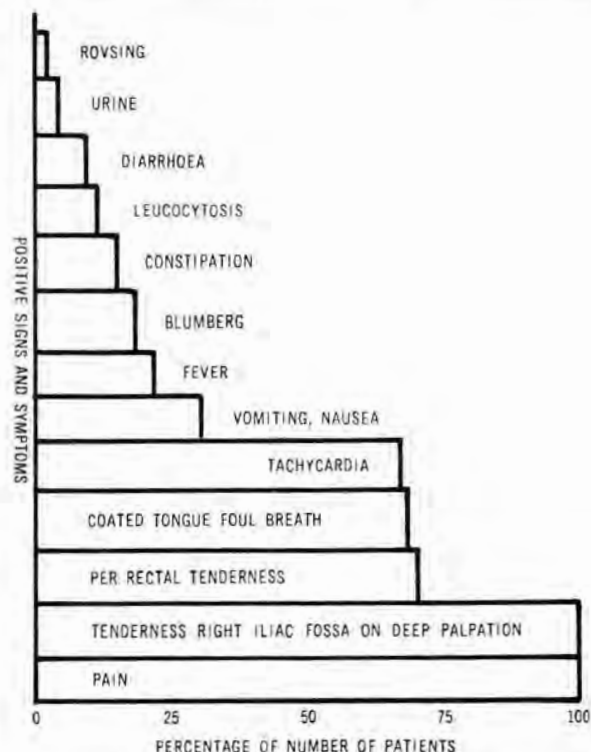


FIGURE 5: FREQUENCY OF SIGNS AND SYMPTOMS

importance has been attached to Rovsing's Sign in the past (Shepherd, 1960).

Contrary to textbook descriptions, leucocytosis was not a diagnostic aid, being present in only 11% of our cases. There did not appear to be much correlation between the degree of leucocytosis and the severity of the appendicular inflammation as found at operation.

Rebound tenderness in the right iliac fossa was present in only 17.8% of our cases. This is contrary to the views of Shepherd who considered it a fairly constant sign (Shepherd, 1960).

The rate of wrong diagnosis in this series of

## ACUTE APPENDICITIS IN WEST MALAYSIA

292 cases was only 4.8%. This compares favourably with the 20% error in diagnosis reported by Thieme (1954). We feel that our interpretation of tenderness on deep palpation as the cardinal sign of acute appendicitis is responsible for the low rate of diagnostic error.

We do not accord with the views of Coldrey (1956) who routinely treated all cases of acute appendicitis of more than 24 hours' duration by non-operative methods. All our cases were operated on within 6 hours of admission to the ward. These included cases of 4 days or longer duration and with evidence of generalised peritonitis.

### Conclusion

Acute appendicitis is the commonest acute abdominal emergency. In a record of 1,179 operations for acute abdominal emergencies, Shepherd stated that 472 were cases of acute appendicitis, a rate of 40% (Shepherd, 1960). Acute appendi-

citis is becoming an increasingly common surgical problem in Malaysia with the rapid increase in the living standards of the people, with consequent fall in cellulose consumption, and rise in meat intake. We have stressed that pain on deep palpation in the right iliac fossa is the cardinal diagnostic point. Early operation in all cases is recommended to lower the mortality and morbidity rate.

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We are also grateful to the doctors and staff of the Department of Surgery, General Hospital, Seremban, Negri Sembilan, Malaysia, without whose co-operation this study would not have been possible.

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# Metastatic tumours of the jaws

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ALTHOUGH METASTATIC TUMOURS of the jaws are rare, Cohen (1958) drew attention to the fact that they existed more frequently than had been suspected. Difficulty in clinical diagnosis as well as non-routine autopsy examinations of the bones of the jaws, were the two reasons he offered. Moorman and Shafer (1954) found that metastatic lesions to the jaws originated mainly from the breast, thyroid, ovary, bronchus, kidney and rectum and their spread probably took place through the vertebral system of veins.

The sites of these metastasis are found more commonly in the mandible in the tooth-bearing region, distal to the canines, rather than in the maxilla. Of the seven cases of true metastatic tumours involving the jaws, Castigliano and Rominger (1954) noted that six affected the mandible and one, both the mandible and maxilla.

Of great clinical significance is the fact that metastatic lesions of the jaws may be the first symptom of malignant disease elsewhere. There is probably no symptom of greater importance than pain and this may be accompanied by swelling. In the mandible a burning sensation and paraesthesia along the course of the inferior alveolar nerve may also be a frequent feature. Looseness of teeth may be another common sign but rarely does one encounter a pathological fracture of the jaws. Radiographs show a non-specific area of rarefaction and the only means of obtaining unequivocal confirmation is by microscopic examination of biopsy material. However, even though there is proof from histology, it is not always possible to detect the site of origin of the primary tumour.

The term, metastatic tumour, has been used in a strict sense. Invasion from primary carcinoma of the oral cavity is excluded and this allows the possible omission of a group of tumours, the epi-

dermoid carcinomas involving the oral cavity, whose clinical presentation is so classical to be readily recognised.

## Clinical Summary

A study of the biopsy reports of carcinomas seen at the Department of Oral Surgery, University of Singapore, revealed there were only five cases of secondary tumours of the jaws between the period 1955 to 1971. A brief clinical summary of these cases is given below:

### Case I — K.K.L. (2724/55)

This was a Chinese male, aged 40 years, who presented with a fleshy sessile growth in the mandible. The growth, with a granular surface, was relatively rapid.

Biopsy (Fig. 1) showed irregular groups of cells, varying in sizes in the corium and deeper parts. The cells were anaplastic, although the arrangement in some cells was suggestive of glandular origin. The overlying stratified squamous epithelium was normal.

### Case II — Y.T. (231513/62)

This patient was a Chinese female, aged 61 years, and presented with the history of having been beaten on the chin by her grandchild with a piece of firewood. The swelling persisted in spite of penicillin injections and as the pain was getting worse, she had come from Ipoh for a consultation.

Extra-oral examination revealed a hard, bony ill-defined swelling in the chin. Intra-oral examination showed that there was a marked expansion of the buccal bone over the left side of the mandible from the canine to the first molar region.

All the anterior incisors, including the left canine and first premolar, were loose. No lymphadenopathy was detected. Radiographs showed areas

## METASTATIC TUMOURS OF JAW

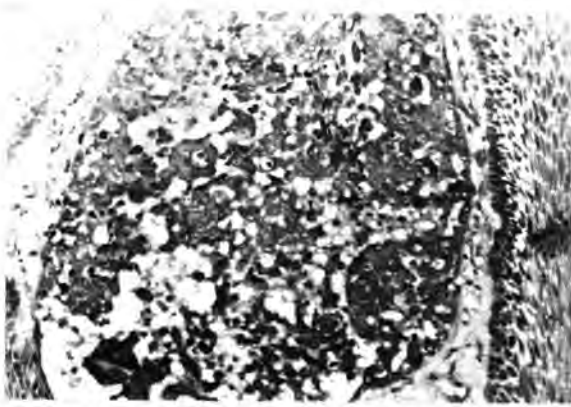


Fig. 1: Biopsy of fleshy sessile growth in the mandible showing irregular groups of cells. These cells are anaplastic although the arrangement in some cells is suggestive of glandular origin. (H & E x 400).

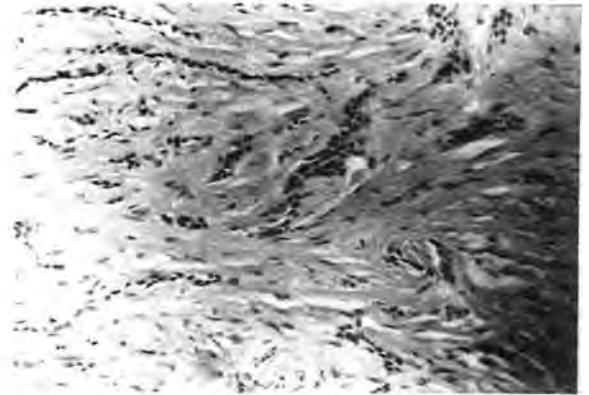


Fig. 2: Biopsy of a piece of bone of the mandible with some soft tissue attached to it. Section shows cells exhibiting both spheroidal and squamoid features. (H & E x 400).

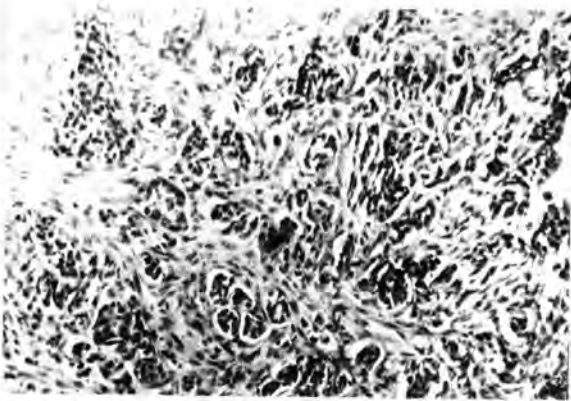


Fig. 3: Biopsy shows islands and strands of neoplastic epithelial tissue in a mature fibrous connective tissue matrix. (H & E x 400).

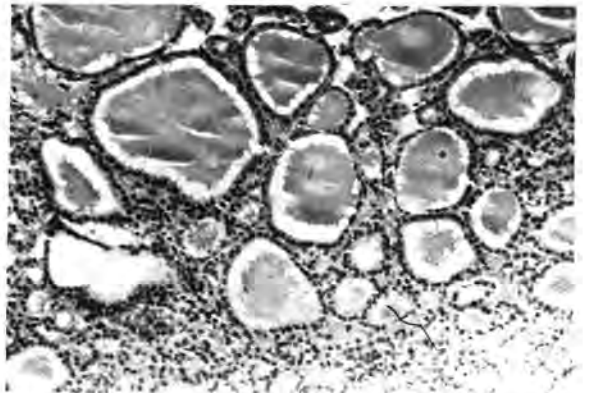


Fig. 4: Biopsy of soft tissue swelling of the mandible showing follicles of thyroid tissue containing much pink-staining colloid and lined by cuboidal cells. (H & E x 400).

of irregular resorption and bone deposition, with resorption being more prominent. There was also resorption of the roots of the incisal teeth.

Biopsy (Fig. 2) showed a carcinoma with spheroidal cells and squamoid features. A diagnosis of secondary carcinoma was made but the primary site could not be ascertained.

She was seen about six months later and on this second occasion, she presented with a swelling of the lower jaw affecting almost the entire mandible from the left first molar to the right first molar region. She also had ulceration of the chin and complained of intense pain radiating from the mandible to the basi-occiput. Radiographs showed an osteolytic lesion with many areas of ossification.

A second biopsy (Fig. 3) was done and this showed islands and strands of neoplastic epithelial

tissues in a mature fibrous connective tissue matrix. The primary site could still not be located.

### Case III — L.F. (214997/62)

This was a Chinese female, aged 64 years, who presented with swelling of the right side of the mandible. The swelling was around the alveolus in the region of the three molars and had been present for one year. The swelling was soft and fleshy. The patient was also noted to have a swelling of the thyroid gland.

Biopsy (Fig. 4) showed that beneath the keratinised squamous epithelium were follicles of thyroid tissue, containing pink-staining colloid and lined by cuboidal cells. A diagnosis of secondary adenocarcinoma from the thyroid gland was made.

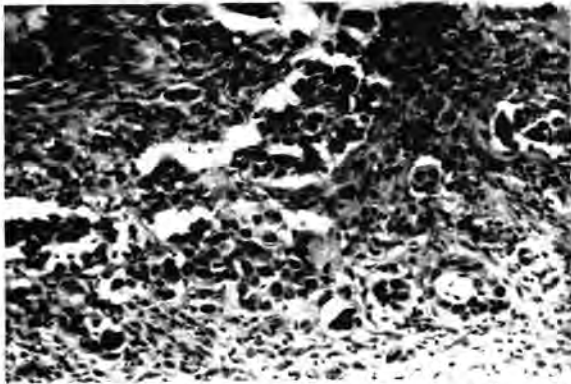


Fig. 5: Biopsy of soft tissue growth around the right mandibular molar showing groups of malignant cells displaying considerable pleomorphism and hyperchromatism. These cells have infiltrated the granulation tissue of the tooth socket. (H & E x 400).

**Case IV — S. (320897/65)**

This was a male Indian patient, aged 65 years, who presented with the history of a loose second molar in the right side of the mandible. This tooth was extracted by the dental officer at Tan Tock Seng Hospital the day before. A fibrous mass was seen in the region of the molar and the socket was unhealthy. The patient was an old case of bronchogenic carcinoma.

Biopsy (Fig. 5) showed groups of malignant cells which displayed considerable pleomorphism and hyperchromatism. These cells had infiltrated the granulation tissues of the tooth socket. The cells were probably epithelial in character and in view of the past history of bronchogenic carcinoma, the origin was probably from that source.

**Case V — L.M.L. (558607/71)**

This was a Chinese female, aged 46 years, who presented with the history of toothache two months ago. The right mandibular first premolar was extracted but the tooth socket had failed to heal. She complained of severe pain over the right mandibular region extending to the temporo-mandibular joint and also occasional headaches. She was an old case of carcinoma right breast stage II treated by radical mastectomy and followed by deep X-ray therapy in 1969 at the Outram Road General Hospital.

Physical examination showed no lymph nodes in the axilla or supraclavicular region. The left breast showed a hard lump but not attached to skin. The right side showed a S-shaped scar but with no evidence of any growths. The tooth socket was ulcerated (Fig. 6) and unhealthy. Radiographs



Fig. 6: Picture shows the unhealthy tooth socket with granulating tissues.



Fig. 7: Radiograph shows the radiolucent area in the mandible and around the right first mandibular premolar region.

showed a radiolucent area not only in the mandible but also in the skull (Figs. 7, 8).

Biopsy (Fig. 9) showed an ulcerated piece of tissue partially covered by squamous epithelium. In the sub-epithelial tissues were numerous packets of malignant cells in a fibrous stroma. There was hardly any differentiation. A diagnosis of metastatic carcinoma from a primary in the breast was made.

**Discussion**

It is noted that in a period of 17 years, only five cases of metastatic carcinoma were seen in the Department of Oral Surgery, University of Singapore. While only two cases showed definite primary sites (adenocarcinoma thyroid and carcinoma breast), one could only be inferred (an old case of bronchogenic carcinoma) and it was difficult to tell the primary lesions of the remaining two.

Two cases presented following extraction of teeth and one case gave the history of having



Fig. 8: Radiograph of the skull showing a metastatic lesion in addition to that found in the mandible as shown in Fig. 7.

been beaten on the chin, which presented some confusion to diagnosis.

Of the five cases, three were women and one presented with carcinoma of the breast, one with adenocarcinoma thyroid and the third with no definite primary site. Of the five cases, only one was an Indian and the rest Chinese. The Indian had a past history of bronchogenic carcinoma.

The majority of the five cases presented with lesions which were osteolytic in nature. Only two cases had severe pain involving the mandible. In all the cases, diagnosis was established only after biopsy was obtained.

#### Summary

- (1) Metastatic tumours of the jaws are rare but worthy of special attention.

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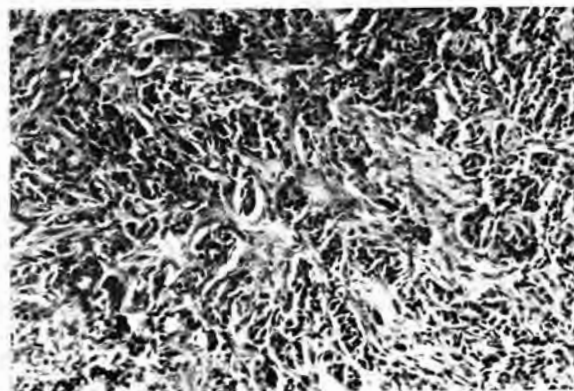


Fig. 9: Biopsy of the tissues in the unhealthy tooth socket showing numerous pockets of malignant cells in a fibrous stroma. There is hardly any differentiation. (H & E x 400).

- (2) Of the five cases studied, three were women; of these five, only one was Indian, the rest being Chinese.
- (3) From the study, only in two cases was it possible to state the primary sites, i.e. adenocarcinoma thyroid and carcinoma breast. This shows that even with biopsy confirmation, the primary site was not easy to pinpoint.
- (4) The symptomatology included pain and swelling of the jaws, "toothache" and looseness of teeth.
- (5) Radiographic examination was not diagnostic as it could represent a cyst or any inflammatory lesion and the only sure way to diagnose the condition is to think about it and to do a biopsy.

#### Acknowledgements

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# Clinical and laboratory experiences of malaria in a Seremban medical practice during the two years: 1970 — 1971.

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## Introduction

THIS IS A SHORT factual report of the authors' experience of malaria during the 24 months which commenced on January 1st, 1970 and ended on 31st December, 1971. All incidences of malaria are those occurring in patients attending the writer's clinic in Seremban, Negri Sembilan. Only cases attending the clinic, or discovered on domiciliary visits, are included. Malaria episodes occurring on rubber or oil palm estates (total population over 20,000 persons) visited by the authors are not dealt with in this report.

The reasons which prompted this report were, firstly, the intrinsic interest of such a report and

secondly, to put on record, without ambiguity, the actual number of slide-proven cases of malaria infection in a particular medical practice over a given period — in this case, 24 months. We say 'slideproven' advisedly as only cases of malaria where the parasite could be clearly identified are included. While a diagnosis of "clinical malaria" was made many times over the period under study and the patients treated accordingly, all the figures reported here are parasitologically proven malaria.

While the figure produced here are "absolute" figures in the sense that they are those obtained as a result of examining patients attending a particular medical practice in a particular place over

## EXPERIENCES OF MALARIA IN MEDICAL PRACTICE

a particular period of time, there is no reason to assume that they are peculiar to this practice. It must be presumed that similar medical practices in the same area see the same type of patients with similar social, ethnic and geographical backgrounds. Huehne et al. (1967) stated that malarial statistics in West Malaysia closely reflect the traditional malaria control schemes with the stress on urban and estate malaria control. The resultant data emphasise microscopically diagnosed malaria admissions in hospitals and are not representative of the major section of population under risk, i.e. the true rural or "kampong" population. They conclude that this results in gross underestimates of the amount of malaria in the country.

It is hoped that a report such as this will serve a useful purpose in making medical practitioners more malaria conscious and resort more frequently to the use of the microscope in the diagnosis of the febrile patients. The report of Toh and Yeo (1971) on malaria in Singapore, an area many believed to be malaria-free, emphasises that a prerequisite to the diagnosis of malaria is an awareness of its presence.

### Materials and Methods

All patients attending the clinic (including patients attended on domiciliary visits) were closely questioned to elicit a history suggestive of malarial infection and blood slides taken for examination in suspected cases. During the height of the maximum malaria transmission season, all patients who were willing to co-operate had blood examination. From mid-April to mid-July, relatives who accompanied patients were also examined where possible. In cases where the physician felt that malaria was clinically the most likely diagnosis, the blood tests were repeated if initially negative.

Thick films, using Field's quick staining method was the standard procedure — when pressure of work was less heavy, thin films were also examined.

In the 12 months (1970), 6,382 blood examinations for malaria were made.

In the 12 months (1970), 1,664 blood examinations were positive for malaria.

In the 12 months (1971), 6,767 blood examinations for malaria were made.

In the 12 months (1971), 1,829 blood examinations were positive for malaria.

There is not an absolute relationship between these two figures, as many of the examinations were repeated tests before the parasite was discovered and also many were follow-up tests after treatment.

### Analysis of Positive blood slides:—

	1970	1971
Total no. of blood examinations	= 6382	6767
Total no. of blood film positive for malaria	= 1664 (26%)	1829 (27%)
Male	= 905 (54.4%)	957 (52.3%)
Female	= 759 (45.6%)	872 (47.7%)

In 1970, the figure of 1,664 positive blood slides represent 1,664 episodes of malaria in 1,273 individuals.

In 1971, the figure of 1,829 positive blood slides represent 1,829 episodes of malaria in 1,594 individuals.

These figures represent in some cases follow-up blood examinations after treatment, indicating either actual failure of treatment (especially in *P. falciparum*) or recrudescence (*P. vivax*). Some episodes were presumably fresh infections (*P. falciparum*) many months after initial treatment and clinical and parasitological cure. As in other series, males predominate but in this series the sex difference is not significant.

	1970	1971
Malay	853 (51.2%)	810 (44.3%)
Indian	397 (23.9%)	523 (28.6%)
Chinese	354 (21.3%)	456 (24.9%)
Europeans & Others	60 (3.6%)	40 (2.2%)
	<u>1664</u>	<u>1829</u>

As can be seen in Table 2, the greatest incidence was among Malay patients — all but a very few of whom came from the rural areas, i.e. kampongs and land development schemes. While some of the Indians came from the town areas, the vast majority came from rubber or oil palm estates. Many of the Chinese came from Seremban town and its environs, others from rubber estates, small villages or even logging camps in the rural area. The remainder were Europeans, all of whom came from rubber or oil palm estates, with the exception of one bank executive in the town and four dependants of British army personnel who were resident in Seremban in early 1970.

### Age Distribution

While we have only divided our subjects into two age groups, i.e. under 12 years and over 12

years, we found, as others have, that malaria has a predilection for the young and most of our cases were under 35 years of age.

	1970	1971
<b>Children under 12 years:</b>		
Under 2 years	= 180 (10.8%)	187 (10.2%)
3 — 5 years	= 129 (7.8%)	150 (8.2%)
6 — 12 years	= 198 (11.9%)	213 (11.6%)
Total	= 507 (30.5%)	550 (30.0%)
Adults and children over 12 years	= 1157 (69.5%)	1279 (70.0%)
Total	= 1664 (100.0%)	1820 (100.0%)

Our youngest patient was 18 days old (mixed *P. vivax* and *P. falciparum*). The mother of this infant also had a mixed infection as had 9 other members of that family. Over the two-year period, we had 22 episodes of cerebral manifestations in children under 12 years of age — ranging from behaviour disorder (aggression, hostility and altered mood) to stupor and semi-coma. As to the former, one eight-year-old Malay boy, with heavy *falciparum* infection, chased his grandmother with a chopper before he developed rigors which indicated his physical illness to his parents.

	1970	1971
<i>P. vivax</i>	1187 (71.3%)	1112 (60.8%)
<i>P. falciparum</i>	436 (26.2%)	619 (33.9%)
<i>P. malariae</i>	3 (0.2%)	Nil
Mixed <i>vivax</i> & <i>falciparum</i>	38 (2.3%)	98 (5.3%)

*Falciparum* malaria was certainly a greater problem from the therapeutic point of view in 1971. While there was an actual increase in the number of individuals with *falciparum* infection in 1971, some of the increase is more apparent rather than real as some of the incidents of *parasitaemia* reported were those occurring in the same patients who failed on chloroquine therapy. It is of interest that in the Singapore report (Toh and Yeo 1971) *falciparum* predominated.

Table 5 calls for some analysis to see the figures in true perspective. While the overall figures for Negri Sembilan are higher in 1972 than in the preceding year, the greatest number of repeat blood examinations took place in this group. The actual number of individuals infected remained about the same. For obvious reasons (the clinic and laboratory

	1970	1971
Negri Sembilan (Total)	= 1523 (91.5%)	1664 (90.97%)
Seremban Town Board	= 727 (43.7%)	639 (34.93%)
N.S. (outside Seremban)	796 (47.8%)	1025 (56.04%)
Selangor	= 71 (4.3%)	113 (6.17%)
Pahang	= 46 (2.8%)	11 (0.6%)
Malacca	= 20 (1.2%)	27 (1.47%)
Johore	= 2 (0.1%)	13 (0.71%)
Perak	= 2 (0.1%)	1 (0.05%)

are in this state) the overall percentage of cases (of the total) is the same. There has been a marked drop in cases occurring in the Town Board area and once again, the drop is much greater than the figures suggest — there were more repeat blood examinations in town patients close to the clinic than in any other group. This drop was due, we feel, to our increased reporting of malaria and vigorous steps taken by the health authorities to deal with mosquito breeding as a result of these reports.

The number of cases reported in individuals from other states will vary from such diverse reasons as the heavy floods in the earlier part of 1971 and difficulty in travelling to the clinic because of road conditions, to the fact that in 1970 many people were sent from Pahang land schemes for blood screening (and this did not happen in 1971).

However, the Selangor figures are of interest. In 1970, we saw 71 cases of malaria from this state from an area just bordering Negri Sembilan in the north. This year, very few cases were detected from this area (the number of patients coming from this area did not drop) and it is assumed once again that reporting the cases had the desired effect. However in 1971, 113 cases from Selangor were detected and reported. 84 of these cases were from one estate in a different area along the state border and many of them were Chloroquine resistant *falciparum* malaria as confirmed by culture and in-vitro testing at the United States Army Medical Research Unit at the Institute for Medical Research in Kuala Lumpur.

#### The "Seasonal Variation" in Malaria Incidence

While in the equatorial zone malaria transmission is possible all the year round, our experience is consistent with established belief that there are

## EXPERIENCES OF MALARIA IN MEDICAL PRACTICE

two "seasons" of maximum transmission, i.e. the spring season (mid-April to mid-July) and the autumn season (October to November) (Sandosham 1965). It is of interest to note how malaria incidence "snowballs" from March to reach a peak in late June — early July and then drops off quite abruptly. This held true for 1970. It was a very classical year. The rise in November-December, 1970 was consistent with the autumnal rise. Many of these were possible recrudesences of Vivax malaria and Gametocyte carriers. The picture in 1971, while it followed the general pattern of 1970 differed in as much as a higher level of transmission appeared to be taking place in the first 3 months of the year. The "rise", when it did come, was about one month late and did not come to a sharp peak and rapid fall-off as in 1970. There was more of a plateau curve and the September to December level was sustained with a sharp rise in December, i.e. 228 cases in December, 1971 as against 93 in the corresponding month of 1970.

What is most pertinent in studying this graph is to be aware that malaria transmission is taking place all the year round and to dismiss malaria as a possible diagnosis "because it is not the malaria season" can be a dangerous error in clinical medicine.

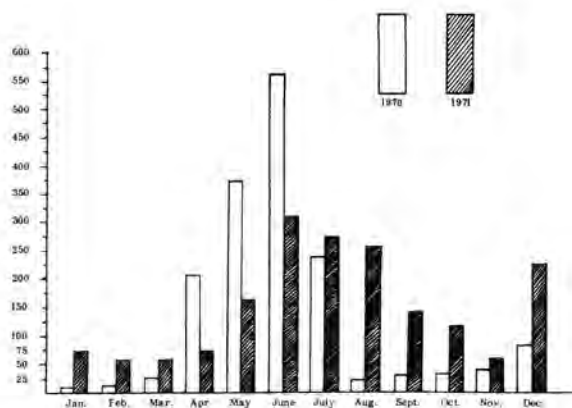
### Discussion

This report being in the nature of a "stock taking" of the incidence of malaria parasitaemia in the writer's own practice needs little further elaboration. All cases of malaria presented were notified week by week to the relevant health authorities (i.e. to the M.O.H. of the patient's district) as is required by law. An analysis of the figures is of interest as one tends to remember months when febrile illnesses were more common than usual but in the absence of meticulous blood examination, one can only form an "impression" that malaria may have been the cause.

From the clinical standpoint, several features of interest arise. The amount of "reported malaria" depends primarily on the clinician — not on the laboratory services. If the physician feels strongly that his patient has malaria, he will order repeated tests. The laboratory will only usually deal with what is sent to it. This is what in fact happened here. Whenever patients were willing to co-operate (they usually were), repeated blood tests were made. We found that if the parasite was not found on examining 200 fields, it was better to take a second blood sample right away (or even later in the day) than to continue searching on the same slide. The number of occasions that a patient, who

TABLE 6

POSITIVE BLOOD SLIDES MONTH BY MONTH 1970 - 1971



was negative on first test and then produced the parasite in the first 10-20 fields on the next test (often half an hour later) was legion. We also made a practice of recording how many fields were examined before detecting the parasite. These figures have not been analysed as yet.

The other feature that was of clinical interest was that at the height of the "season" we could predict, with a high degree of accuracy, that the patient was probably having falciparum malaria. This was especially so with children. If the patient presented with a moderate pyrexia (under 100°F), pallor, sweating, and complained of nausea with one or two loose stools (with or without abdominal pain) falciparum was very likely. If he presented on the first day of his illness, the parasite was usually found without much searching but if on the second or third day, repeated tests had often to be made. This type of "abdominal malaria" or "intermittent bilious malaria" as described by the older workers was quite common in 1970. Vivax malaria, in general, tended to be more dramatic in its onset but less serious in its clinical course, whereas falciparum came in like the proverbial lamb, but untreated, became a lion that required considerable taming!

One of the problems we encountered in this work is ironic and not a little paradoxical! Patients (and not a few medical men) will accept a clinical diagnosis of malaria (in the absence of a blood examination) with good grace on the basis that anything is possible and as long as they get well, it does not really matter. It is, however, surprising how many resent a diagnosis of malaria which has been made after a careful search for, and discovery, of the parasite. This is especially so in patients



who have not experienced the classical triad of chills, fever and sweats. Many such patients who present with low-grade fever (or are apyrexial), cough, malaise and often insomnia, will only reluctantly admit to attacks of "flu" over the preceding days or weeks. Many have already had courses of antimalarials (along with other drugs) and the parasite is difficult to find.

Whatever the merits of the old arguments that vivax malaria in semi-immune adults (who are asymptomatic) should be left alone, one cannot stress too strongly the dangers of missing the diagnosis of falciparum malaria in infants and young children. This form of malaria so often presents with vomiting and diarrhoea (with or without bronchitis) which fails to respond to anything other than specific antimalarial therapy (especially parenteral quinine at the onset of treatment) that failure to examine the blood for malarial parasite in an endemic malarial zone in such cases is a dangerous omission, to say the least!

There is little scope in this brief report to deal with chemotherapy of malaria in details — we are dealing here chiefly with personal experiences over the past two years and have gone into

this problem in depth recently elsewhere (O'Holohan and Matthews 1971).

There is much work being done at present on the role of the 4-aminoquinolines in malaria chemotherapy. That *P. falciparum* is Chloroquine resistant in many areas of West Malaysia is now an established fact. A more vexed question is the status of the 4-Aminoquinolines and *P. vivax*. We have found it necessary to use larger and more prolonged dosage schemes to clear the blood of the asexual stage of *P. vivax* than heretofore. The moral is that one must not adhere blindly to the recommended dosage, i.e. 900 mg. base the first day, followed by 300 mg. base in divided doses to a total of 1.5 G.. McKelvey et al (1971) recommended up to 2.5 G. to 3 G. total dose in, especially, falciparum malaria before declaring the parasite drug resistant.

Before assuming that vivax malaria is failing to respond, it must be ascertained that the patient is taking the drug and furthermore is getting enough of it for a sufficient period of time. This is important because our experience is that about 60% of adults suffer side effects from the 4-Aminoquinolines, some of them intolerable and certainly more disabling than their vivax malaria. Fortunately children are more tolerant of this drug.

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# The problem of postpartum haemorrhage in the Malaysia-Singapore region

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POSTPARTUM HAEMORRHAGE is still a major cause of maternal mortality. This is especially so in the underdeveloped countries of Asia, where an interplay of a multitude of factors become contributory, such as poor nutrition and anaemia, grande multiparity, and the lack of adequate skilled obstetric personnel and hospital facilities. Postpartum haemorrhage is also the most important underlying cause of maternal morbidity during the puerperium (Thomas, 1962).

## Study of the Problem

The results of the problem of postpartum haemorrhage and maternal mortality pattern for the Obstetric Unit of the University Hospital, University of Malaya, in Kuala Lumpur, Malaysia, during

the first 3½ years since its establishment, from March 1968 to August 1971 inclusive, and covering just under 8,000 consecutive comprehensively documented deliveries, is reviewed in this paper.

## RESULTS OF STUDY AT THE UNIVERSITY HOSPITAL

### Maternal Mortality Pattern

In the period under review, there was a total of 7,771 mothers delivered at the University Hospital, in which there were 5 maternal deaths, giving an overall maternal mortality rate of 0.64 per 1,000 deliveries. Two of these deaths were due to severe septicaemia, two to fulminating eclampsia, and the last maternal death to advanced pulmonary tuberculosis with severe pulmonary in-

<b>Table I</b> <b>University of Malaya</b> <b>University Hospital</b>	
<b>Maternal Mortality Pattern</b>	
Period of Study: March 1968 to August 1971 3½ years (42 months)	
Total No. of Deliveries	7,771
Total No. of Maternal Deaths	5
Overall Maternal Mortality Rate	0.64/1,000
No. of Maternal Deaths from PPH	Nil
Maternal Mortality Rate from PPH	Nil

<b>Table II</b> <b>University of Malaya</b> <b>University Hospital</b>	
<b>PPH Incidence Pattern</b>	
Total No. of Deliveries	7,771
No. of PPH Deliveries	196
Incidence of PPH	2.5% or 1 in 40 Deliveries

<b>Table III</b> <b>University of Malaya</b> <b>University Hospital</b>		
<b>PPH Severity Distributional Pattern</b> <b>(196 cases)</b>		
	<i>No. of Cases</i>	<i>%</i>
PPH of 500 ml. to 1,000 ml.	164	83.7
PPH of 1,000 ml. to 1,500 ml.	9	4.6
PPH of over 1,500 ml.	4	2.0
PPH associated with BBA* (undetermined blood loss)	19	9.7
*BBA = Born Before Arrival		

sufficiency. All 5 of these maternal deaths were unbooked, not having had any previous ante-natal care at this hospital. Hence, there was no maternal mortality from postpartum haemorrhage in this hospital, during the period under review.

**P.P.H. Incidence Pattern**

The criterion of postpartum haemorrhage used in this study is the widely accepted criterion of at least 500 ml. blood loss in the first 24 hours following delivery. There were 196 cases of postpartum haemorrhage amongst the 7,771 deliveries in this study, giving an incidence of PPH of 2.5%, or 1 in 40 deliveries. This incidence of 2.5% is low, compared to the estimated incidence of

<b>Table IV</b> <b>University of Malaya</b> <b>University Hospital</b>	
<b>Retained Placenta Incidence Pattern</b>	
Total No. of Deliveries	7,771
No. of Retained Placenta Deliveries	123
Incidence of Retained Placenta	1.6% or 1 in 62.5 Deliveries
Incidence of Retained Placenta (Excluding BBA Deliveries)	1.3% or 1 in 76.9 Deliveries

<b>Table V</b> <b>University of Malaya</b> <b>University Hospital</b>		
<b>Retained Placenta Distributional Pattern</b> <b>(123 cases)</b>		
	<i>No. of Cases</i>	<i>%</i>
Retained Placenta with PPH	14	11.4
Retained Placenta/BBA with PPH	7	5.7
Retained Placenta/BBA without PPH	13	10.5
Retained Placenta only without PPH	89	72.4

<b>Table VI</b> <b>University of Malaya</b> <b>University Hospital</b>		
<b>BBA (Born Before Arrival) Pattern</b> <b>(116 cases)</b>		
	<i>No. of Cases</i>	<i>%</i>
BBA with PPH only	12	10.3
BBA with PPH and Retained Placenta	7	6.0
BBA with Retained Placenta only	13	11.2
BBA only	84	72.5

10% postpartum haemorrhage, as quoted by Eastman (1956).

**P.P.H. Severity Distributional Pattern**

In Table III is shown the distributional pattern of the severity of the cases of postpartum haemorrhage. It is apparent that most (83.7%) of the 196 cases of postpartum haemorrhage had a total blood loss of 500 to 1,000 ml. In 4.6% (9 cases) of the PPH cases, the blood loss was between 1,000 ml. to 1,500 ml.; and in a further 2% (4 cases) of cases, the blood loss was over 1,500 ml. In the remaining 9.7% (19 cases) of the PPH cases, the delivery occurred before the mothers could be

PROBLEM OF POSTPARTUM HAEMORRHAGE

**Table VII**  
**Comparative Maternal Mortality Trends from Post-Partum Haemorrhage**

PLACE	KANDANG KERBAU HOSPITAL, SINGAPORE	ENGLAND & WALES	UNIVERSITY HOSPITAL UNIVERSITY OF MALAYA
Period Under Review	1955-1962 (8 Years)	1955-1960 (6 Years)	March 1968-Aug. 1971 (3½ Years)
Total No. of Deliveries	255,926	4,471,625	7,771
Total No. of Maternal Deaths	208	2,663	5
Total Maternal Mortality Rate	0.81/1,000	0.60/1,000	0.64/1,000
Total No. of Maternal Deaths from PPH	56	228	Nil
Maternal Mortality Rate from PPH	0.219/1,000	0.051/1,000	Nil
Total No. of Maternal Deaths Reviewed	208	2,196	5
% of Maternal Deaths from PPH	26.9%	10.4%	Nil
No. of Deaths from Atonic PPH with Retained Placenta	22	39	Nil
Maternal Mortality Rate	0.086/1,000	0.009/1,000	Nil
No. of Other PPH Deaths excluding Trauma	20	104	Nil
Maternal Mortality Rate	0.078/1,000	0.023/1,000	Nil
No. of Traumatic PPH Deaths	14 (12)	85 (62)	Nil
Maternal Mortality Rate	0.055/1,000	0.019/1,000	Nil

admitted to the hospital (BBA), and hence their total blood loss could not be accurately determined.

**Retained Placenta Pattern**

In this hospital, it is the standard routine practice to administer oxytocics in the management of the third stage of labour, prior to delivery of the placenta. This is either as I/V Ergometrine 0.5 mgm. with the delivery of the baby's anterior shoulder or as I/M Syntometrine 1 ml. with the crowning of the foetal head. To what extent this practice has influenced the incidence of retained placenta in this unit is difficult to evaluate. In this study, there were 123 cases of retained placenta amongst the 7,771 deliveries, giving an incidence of 1.6% or 1 in 62.5 deliveries. However, if the BBA deliveries are excluded, the incidence of retained placenta is 1.3% or 1 in 76.9 deliveries.

In Table V is shown the breakdown pattern of the 123 cases of retained placenta encountered in this study. This table is self-explanatory. It will be of note that in 72.4% of retained placenta cases, there was no associated postpartum haemorrhage.

**B.B.A. (Born Before Arrival) Pattern**

During the period under review, there were 116 cases, where the baby was born before arrival (BBA) of the mother at the University Hospital. Complications of the third stage of labour are the common reasons for such unplanned admissions. In this study, 10.3% (12 cases) of BBA cases were admitted because of postpartum haemorrhage, 6.0% (7 cases) with postpartum haemorrhage and retained placenta, and a further 11.2% (13 cases) of BBA cases because of retained placenta per se.

**Table VIII**  
**Post-Partum Haemorrhage**  
**An Evaluation of the Factors Contributing**  
**to the Good Results at the University Hospital,**  
**University of Malaya**

**A. In Ante-Partum Period**

1. Early booking for ante-natal care.
2. Routine haemoglobin estimation at booking visit, and thereafter at 4 weekly intervals.
3. Comprehensive investigations for all cases of anaemia with haemoglobin levels of 10 Gm.% or less.
4. Aggressive treatment of all cases of anaemia with haemoglobin levels of 10 Gm.% or less, including the liberal use of Total Dose Infusion of Imferron intravenously, when indicated.

**B. In Intra-Partum Period**

1. Blood group determination of all cases.
2. Cross-match blood (2 pints) for all cases with Hb. less than 10 Gm.%.
3. Operation of a "Flying Squad" Service.
4. All deliveries are doctor-supervised.
5. I/M Syntometrine 1 ml. for all deliveries.
6. I/V Ergometrine 0.5 mgm. for all deliveries, with past history of PPH, or present episode of PPH.
7. Active management of the 3rd stage of labour using the "Controlled Cord Traction" philosophy.
8. Early and prompt manual removal of retained placenta, (when retained for more than half an hour).
9. Observance of the "Fourth Stage of Labour" philosophy.
10. Liberal use of blood and plasma expanders to combat shock.
11. Treatment of severe post partum uterine atonicity by I/V Oxytocin Drips in high concentrations of 50, 100, or 200 units per pint.
12. The use of Direct Intra-Uterine Oxytocin by trans-abdominal route, found to be very effective by author in the management of cases of severe uterine atonicity, not responding to I/V Oxytocin Drip.
13. Skilled intrapartum obstetric practice to avoid traumatic PPH.
14. Prompt and aggressive treatment of all cases of severe accidental haemorrhage to prevent coagulation disorders and uterine atonicity.
15. Hysterectomy to be undertaken timely, when indicated. But good obstetric practice can avoid the need for hysterectomy.

**Comparative Maternal Mortality Trends from Postpartum Haemorrhage**

In Table VII is presented the comparative maternal mortality trends from postpartum haemorrhage in 3 areas. In the first column is presented the pattern as seen at the Kandang Kerbau Hospital, Singapore (Lean, 1965 and Sinnathuray, 1965). In the second column is the pattern prevailing in England and Wales at about the same time (Walker et al, 1957, 1960 and 1963). In the third column is presented the comparative data for the University Hospital, University of Malaya, Malaysia, for the first 3½ years (March 1968 to August 1971), since the inception of the Hospital Unit.

It is apparent from the study of Table VII that the overall total maternal mortality rate of 0.64/1,000 for the University Hospital, Malaysia, is much lower than the rate of 0.81/1,000 for the Kandang Kerbau Hospital, Singapore, and is very

closely comparable to the rate of 0.60/1,000 for the developed area of England and Wales then. However, when the maternal mortality in relation to the varied aspects of postpartum haemorrhage is comparatively reviewed in the three regions (as shown in the rest of Table VII), it is quite apparent that the maternal mortality in all aspects of postpartum haemorrhage is several times (3 to 9) worse at the Kandang Kerbau Hospital, Singapore, as compared to that for England and Wales (Sinnathuray, 1965). In sharp contrast, there were no maternal deaths associated with any aspect of postpartum haemorrhage at the University Hospital, Malaysia, although there were 5 other maternal deaths (Table I).

**An Evaluation of the Factors Contributing to the Good Results at the University Hospital, University of Malaya**

It is reasonable to state that the availability of skilled medical personnel in adequate numbers

**Table IX**

**"Action" Plan for the Reduction of Maternal Mortality and Morbidity from Post-Partum Haemorrhage in the Malaysia-Singapore Region**

1. Improvement in the Socio-Economic Standards of the community, and thereby ensure optimal nutrition (especially anaemia) of pregnant women.
2. Comprehensive Ante-Natal Care:—
  - (a) Detection and treatment of anaemia
  - (b) Detection and treatment of Toxaemia of Pregnancy
  - (c) Selection of cases for Hospital confinement
3. Adequate Hospital Facilities for the confinement of high risk cases.
4. Health Education of the public to ensure full utilisation of the Available Health Services.
5. Skilled Intrapartum Obstetrical Care:—
  - (a) Adequate trained obstetric personnel
  - (b) Avoidance of prolonged labours
  - (c) Skillful management of the second stage of labour
  - (d) Proper and active management of the third stage of labour including the routine use of oxytocics and controlled cord traction
  - (e) Prompt treatment of causative factor of PPH
  - (f) Observance of the fourth stage of labour — close observation of the mother for one hour following the delivery of the baby.
6. Obstetric Anaesthetic Service.
7. Adequate Blood Transfusion Service:—
  - (a) Elective blood grouping/cross-matching of high risk Ante-Natal cases
  - (b) Establishment of a Regional (Hospital) Blood Transfusion Service
  - (c) Ready availability of blood stocks
8. "Flying Squad" Service, to ensure efficient treatment of postpartum haemorrhage outside the Hospital.
9. Comprehensive Family Planning Service, so as to reduce the number of grande multiparity who are most susceptible to have postpartum haemorrhage.

and the excellent physical facilities have, in general, been responsible for the low incidence of postpartum haemorrhage (Table II), the absence of maternal mortality, and low incidence of maternal morbidity from postpartum haemorrhage at the University Hospital, Malaysia. However, there are many specific factors operating not only in the intrapartum but also in the antepartum period of patient care, which have contributed to the good results at the University Hospital, and these have been tabulated in Table VIII, which is self-explanatory.

**'Action' Plan for the Reduction of Maternal Mortality and Morbidity from Postpartum Haemorrhage in the Malaysia-Singapore Region**

In Table IX is put forth an "action" plan for the reduction of maternal mortality and morbidity from postpartum haemorrhage in the Malaysia-Singapore region, based upon the author's experiences at the Kandang Kerbau Hospital, Singapore (Sinnathuray, 1965) and the University Hospital, Kuala Lumpur, Malaysia. The contents of this table (Table IX) are self-explanatory.

It is quite apparent from the suggested "action" plan that there are many aspects of the health services which have a contributory part to play, if the maternal mortality and morbidity trends from postpartum haemorrhage in Asian countries are to be effectively reduced to those comparable levels prevailing in the developed Western countries.

**Summary**

1. The overall maternal mortality pattern and the problem of postpartum haemorrhage at the Obstetric Unit of the University Hospital, University of Malaya in Kuala Lumpur, Malaysia during the first 3½ years, since its establishment in March 1968, and covering just under 8,000 consecutive deliveries, is comprehensively reviewed.

2. A comparative study is made of the maternal mortality trends in cases of postpartum haemorrhage, as seen in the two major teaching hospitals of the Singapore-Malaysia region, and for the "England and Wales" region of the United Kingdom. The absence of maternal mortality from postpartum haemorrhage, and the relatively low incidence of postpartum haemorrhage and maternal morbidity from postpartum haemorrhage at the University Hospital in Kuala Lumpur, as compared to the Kandang Kerbau Hospital, Singapore and United Kingdom appear strikingly obvious.

3. Some of the important factors that have contributed towards the attainment of better results at the University Hospital, Kuala Lumpur as compared to the Kandang Kerbau Hospital in Singapore are discussed.

4. Every maternal death from postpartum haemorrhage is theoretically an "avoidable maternal death", and in the light of this philosophy, an "action" plan is put forth for the reduction of maternal mortality and morbidity from postpartum haemorrhage in the Malaysia-Singapore region in particular, and the rest of Asia in general, based upon the above experiences.

**Acknowledgement**

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# Amnioscopy in high risk pregnancy

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## Synopsis

EXPERIENCE WITH AMNIOSCOPIC studies on 280 patients with high risk pregnancy in the University Hospital, Kuala Lumpur, is reported. The technique of Saling (1962) was employed. Results are classed as clear (negative) or meconium-stained (positive).

Toxaemia of pregnancy forms the largest single group of patients (57.1 per cent). Prolonged pregnancy (28.9 per cent) forms the next largest group. Of 51 patients with meconium staining, 32 (61.7 per cent) were correctly diagnosed, giving 19 false negative. There were also 34 false positive.

The examination is not difficult to master, does not cause the patient great discomfort and the results useful as an aid in the management of patients with high risk pregnancy. It is suggested that plentiful of black hair may be a hindrance in the method.

The passage of meconium is regarded as an unfavourable sign to the fetus. Almost 50 per cent of neonates, with this sign alone, shows a delay

in onset of respiration for more than 4 minutes after delivery (Wood and Pinkerton 1961). This increased hazard to fetal well-being has also been shown by White (1955), Wren (1960), and Cox (1961).

The presence of meconium-stained liquor, in the absence of fetal heart arrhythmias, has been shown by Coltard et al (1969) to be associated with a 9 per cent fetal distress as demonstrated by acidosis in fetal blood sampling. However, it must be remembered that in some, the meconium has been passed days previously and the fetal blood sampling. However, it must be remembered that in some, the meconium has been passed days previously and the fetal acidosis no longer exists.

Amnioscopy is now widely used as a means of detecting meconium-staining in the liquor. Saling (1962) pioneered this work; in 1,355 high risk patients monitored by amnioscopy, he reduced the perinatal mortality to 14 per thousand. This study sets forth to evaluate the value of amnioscopy in monitoring high risk patients. Further, it looks into



the maintenance of such a service in a busy obstetric unit. The study was carried out in the University Hospital, Kuala Lumpur.

**Method**

The technique for amnioscopy has been documented (Saling 1962, Barham 1968). The authors have adopted the method and recommendations of Saling (1962). The technique has been found to be relatively simple and can be performed by any doctor after a brief period of training. Patients could be either in-patients or out-patients. They feel no ill-effects after this simple and quick procedure. High risk patients were amnioscoped every 48-72 hours. The amnioscopic studies were carried out under aseptic conditions. Swabs for culture were taken from the cervical canal before each examination.

Amnioscopy clinics are organised in the morning to facilitate inductions of labour where indicated. The procedure is explained to each patient before she is included in the study. Whenever any suspicious signs are seen, a joint examination by both authors is carried out.

The colour of the forewaters is simply classified as clear or meconium-stained. The volume of liquor in the forewaters and the presence of vernix caseosa are noted. In patients where the head is engaged and no liquor seen in the forewater, the fetal head is gently displaced and the liquor examined. In spite of this, some patients showed no liquor in the forewater.

Patients with positive findings are induced by low amniotomy, either at amnioscopy, or within a few hours. At amniotomy, the colour of the liquor was noted. This observation is sometimes carried out by independent observers.

**Racial Distribution**

The racial distribution of the 280 patients are shown in table I. The distribution is similar to that of the ratio of the various races admitted to the maternity wards.

**Age Group**

All the patients are between 16 to 45 years old. The majority (59.4 per cent) are between 21-35 years old.

**Indications for amnioscopy**

Toxaemias of pregnancy form the largest single group of patients in this study — 57.1 per cent. This group includes any patient with a blood pressure reading of 120/90 mm Hg and above, after bed rest in the ward. There may or may not be other signs of pre-eclampsia.

**Table I**  
**Racial Distribution of 280 patients**

Race	No. of Patients
Chinese	149 (53.0%)
Malay	68 (24.0%)
Indian	52 (18.0%)
Others	11 ( 5.0%)
Total	280 (100.0%)

**Table II**  
**Indications for Amnioscopy**

Indications	No. of Patients
Toxaemias of pregnancy	160 (57.1%)
Post-dates	81 (28.9%)
Doubtful/Unknown dates	25 ( 8.9%)
Miscellaneous	14 ( 5.1%)

The next group of patients are those who have passed the expected dates of delivery — 28.9 per cent. Unless otherwise indicated by amnioscopy or other clinical signs, the pregnancies in these patients were terminated 14 days after the expected dates of delivery.

Other patient had amnioscopic supervision because of uncertain dates, diabetes mellitus, bad obstetrical history and suspected placental insufficiency.

The aim in this series is to use amnioscopy as an ancillary aid in the management of patients whose pregnancies are considered to be high risks. Hence, pregnancies may be terminated in spite of favourable amnioscopic findings.

**Number of examinations**

Table III shows 51.8 per cent of the patients required only one amnioscopic examination each. Of these, 34 patients went into spontaneous labour within 24 hours of amnioscopy. Despite favourable amnioscopic findings, patients had induction of labour for other reasons.

Patients who had 2 amnioscopic examinations form 23.2 per cent and 15.0 per cent had 3 examinations. One patient who had uncertain dates had 8 amnioscopic examinations. She subsequently delivered spontaneously a baby weighing 3250 gms.

**Gestation period**

The majority of patients, who had amnioscopic monitoring, were between 38 to 42 weeks of gestation. There were two exceptions — a patient

## AMNIOSCOPY IN HIGH RISE PREGNANCY



Fig. 1: Amnioscopic view of clear liquor amni.



Fig. 2: Amnioscopic view of meconium-stained liquor amni.

at 32 weeks of gestation and a patient at 35 weeks of gestation. The former, a patient with twin pregnancy, had severe pre-eclampsia; urine estimations showed falling levels of oestriols. Meconium-stained liquor was detected by amnioscopy. The pregnancy was terminated at 33 weeks gestation. A live first twin was delivered. The liquor was meconium-stained. The second twin was a macerated still-born.

The second patient was also a case of severe pre-eclampsia with falling urinary oestriol level. Amnioscopy showed meconium-stained liquor. A healthy baby was delivered following induction.

The main contra-indication to early amnioscopic supervision is accidental amniotomy. In this series, accidental rupture of the forewaters occurred once, an incidence of 0.35 per cent. It is the authors' opinion that the risk of accidental rupture of membrane is not so significant as to deter clinicians from performing amnioscopy before the 36th week of gestation, if monitoring is indicated.

### Result

The results are shown in Table IV.

Of 51 patients who actually had meconium-stained liquor, 32 patients (61.7 per cent) were correctly detected before the onset of labour. The meconium-stained liquor in the other 19 patients (38.3 per cent) were missed at amnioscopy. The actual incidence of meconium-stained liquor in this series of patients was 18.2 per cent. This is fairly high when compared with the results of: Hintingford (1968) 11.2 per cent; Saling (1962) 13.0 per cent; Korknacki (1968) 12.8 per cent; and Barham (1968) 13.0 per cent.

Thirty-four patients, diagnosed as having meconium-stained liquor at amnioscopy, were found to have clear liquor at amniotomy. They all had uncomplicated deliveries thereafter. Many had scanty liquor.

### Outcome of pregnancy

Of 280 patients, 170 patients (58.9 per cent) had induced labours. This group consisted of those patients who were diagnosed as having meconium-stained liquor at amnioscopy and patients who failed to respond to management.

Seventy-one patients (25.3 per cent) were

**Table III**  
Number of Amnioscopic Examinations Each Patient Underwent

No. of Amnioscopic Examinations	No. of Patients
1	145
2	65
3	42
4	14
5	9
6	4
7	0
8	1

**Table IV**  
Results of Amnioscopic Study in 280 patients

Amnioscopic Finding	Number
Positive	32
False Negative	19
False Positive	34

allowed to continue their pregnancies, until they went into spontaneous labours.

One of the known complications of amnioscopy is that some patients tended to go into labour after amnioscopic examinations. In this study, 34 (12.1 per cent) patients went into labour within 24 hours of the first amnioscopic examination.

Of these patients who went into labour following amnioscopy, 17 (50.0 per cent) patients were more than 40 weeks maturity and none of the patients was less than 38 weeks maturity. In this group of patients, all the babies produced were healthy. The results are shown in Table VI.

#### Complications

A cervical swab was taken as a routine before each amnioscopic examination. The incidence of infection before, during and after labour and delivery was not significantly different from patients who did not have amnioscopy.

Accidental amniotomy accounted for 0.35 per cent — only one patient. She went into labour and delivered a healthy infant. The incidence of accidental rupture of membranes reported by various workers are: Saling (1962) 2.1 per cent; Barham (1968) 1.0 per cent; and Browne (1968) 3.0 per cent. Brisk bleeding as a result of amnioscopy was not encountered.

**Table V**  
Types of labour following amnioscopy

Type of Labour	No. of Patients
Induced	170
Spontaneous	71
Spontaneous with 24 hours of amnioscopy	34
Elective Caesarean section	5
Total	280

**Table VI**  
Thirty-four patients who had "Amnioscopy Induced" labours

Gestation Period	No. of Patients
38 — 39 weeks	5 (14.7%)
39 — 40 weeks	9 (26.6%)
Over 40 weeks	17 (50.0%)
Unknown	3 (8.8%)
Total	34 (100.0%)

#### Perinatal mortality

There were two perinatal deaths. The first baby died four hours following a difficult vacuum extraction delivery. Autopsy showed a severe intracranial injury and haemorrhage. The second baby lost was the second twin, born macerated. The corrected perinatal mortality (excluding the death from birth trauma) was 3.5 per thousand.

#### Discussion

Bailey (1948) was the first to report on the use of amnioscopy on monitoring the fetus in utero. He was not convinced of its value. Saling (1962) produced good results by amnioscopic supervision of high risk patients. Mainly due to Saling's work, amnioscopy has gained popularity in many centres in Europe, the United Kingdom and Australia. The basic aim is to monitor the intrauterine environment of the fetus.

The mechanism which causes the passage of meconium is controversial. However, it is generally accepted that the relaxation of the sphincter ani muscles is initiated by fetal hypoxia.

Walker (1954) suggested that the passage of meconium is associated with reduced oxygen tension of the blood in the umbilical vein, usually at or below 30 per cent. The low oxygen tension is said to stimulate the vagus nerve and relax

## AMNIOSCOPY IN HIGH RISE PREGNANCY



**Fig. 3: Amnioscopic view. Blood vessels and stains obscuring view.**



**Fig. 4: Amnioscopic view. Blood stains obscuring view.**

the sphincter ani. In a study of 2,301 patients, Leonard (1962) found 4.3 per cent had meconium-stained liquor. The aetiology of this was unknown in 58 per cent of the patients. The perinatal loss in the group with meconium-stained liquor was 9.5 per cent, 8 times higher than usual.

Perinatal mortality in patients with meconium-stained liquor has been reported as 100 per thousand by Fitzgerald and McFarlane (1955); 30.0 per thousand by Cox (1961). Even though the presence of meconium in the liquor suggests a current or past episode of hypoxia (Morris and Beard 1968), the degree of risk to the fetus is still uncertain. On the other hand, a fetus may perish from hypoxia in the absence of meconium-stained liquor.

In this study, the pick-up rate has not been encouraging. Of 66 patients diagnosed as having meconium-stained liquor, 32 turned out to be correct at amniotomy. On the other hand, 19 patients with meconium-stained liquor were missed. (See Table IV) This large number of false negative is worrying. This may be due to the inexperience

of the workers rather than the inadequacy of the method. Hintingford et al (1968) reported 2 false positives and one false negative in a group of 290 patients. Henry (1969) reported one false negative in 204 patients. Browne et al (1968) reported two patients with antepartum intrauterine death with maceration who were found to have clear liquor at amniotomy, four days and six days after intrauterine deaths respectively. Three of their 1,434 patients failed to reveal that hypoxia was imminent. The fetuses succumbed during labour within 24 hours of the last amnioscopic examination when the liquor was reported to be clear.

Barham (1968) stated that, with practice, the amnioscopist should be able to detect meconium-stained liquor in at least one half of the examined patients who develop meconium-staining. The authors agree with this view. However, there are certain groups of patients in whom assessment of the liquor is difficult, e.g. patients with scanty liquor in the forewater in spite of having displaced the fetal head.

However, Henry (1969) considered these

patients with scanty liquor as positive amnioscopic findings. This is then taken as an indication to terminate the pregnancy. In the other group of patients, for some unknown reason, meconium does not circulate to the forewaters; often the meconium is old and the liquor scanty. The presence of old blood stains on the membranes can also cause confusion at amnioscopy. Asian babies tend to have rich growth of black hair. The authors consider this black background may hinder the

appreciation of the colour of the liquor. Hence the high percentage of false positive. However, until further work is done on black-haired babies, this remains a conjecture.

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# A case of glomus jugulare tumour

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GUILD (1941, 1951) DESCRIBED the glomus jugulare as consisting of one or more bodies lying in the adventitia of the dome of the jugular bulb. Since then, it is known that the glomus jugulare is part of the chemoreceptor system, the carotid body being the best known example. The glomus jugulare has a histology which resembles the carotid body. It consists of capillaries separated by a delicate stroma containing numerous epitheloid cells rich in cytoplasm.

Rosenwasser (1945) reported the first tumour arising from this structure when he suggested that "carotid body tumour of the middle ear and the mastoid" might originate in the glomus jugulare. Such tumours are composed of cells in alveolar arrangement with numerous sinusoidal vessels (Latles and Waltner, 1949). Situated in the jugular foramen, they produce symptoms by eroding into the middle ear, or intracranium, especially the

posterior cranial fossa causing palsies of the related lower cranial nerves.

The purpose of describing this patient is to discuss the possible diagnosis and review the more common presentations.

P.C.M. U.H. R.N. 080769, a 39-year-old Chinese married woman, when seen on 9th July 1969, first noticed a change in her voice, which became softer and hoarse about a year ago. She also experienced progressive dysphagia in which both liquid and solid food appeared to be stuck at her throat. Together with these symptoms, she had persistent tinnitus and increasing deafness of her right ear. She also complained of blurring of vision, with diplopia on seeing distant objects. These symptoms appeared to have followed one another fairly quickly. She became definitely aware that a lump on the right side of the neck seemed to be growing in size over a period of a month,



Fig. 1 Tomogram of Jugular Bulb  
Arrow indicates site of erosion of  
Right Jugular Bulb

prior to her being seen in this hospital. On direct questioning, she revealed she had aches on that side of the neck, for years, and this was sometimes initiated by neck movements. She had also noticed a small lump in that region.

For these symptoms, she was admitted to the surgical unit of another hospital on three separate occasions for investigations of a possible nasopharyngeal carcinoma within the last year. A laryngoscopy revealed a paralysis of the right vocal cord. Biopsy of the post cricoid region showed evidence of slight mild chronic inflammation only. Other examinations, like oesophagoscopy, barium swallow and bronchoscopy, provided no additional information.

When she was first examined, she had multiple lower motor neurone cranial nerve palsy of the right 5th, 6th, 8th, 9th, 10th, 11th and 12th cranial nerves. No papilloedema was seen. A swelling was found on the right side of the neck extending from almost the right angle of the jaw to just across the midline posteriorly. It was pulsatile, which ceased immediately on pressure over the right carotid artery. No bruit was heard over it or the right carotid artery. The right ear drum was thickened and bulging, suggesting presence of a tumour. The rest of the examination provided no significant findings.

Investigations revealed a haemoglobin of 14 gm%, P.C.V. of 41%, total white cell count of 8,500 cells/cu.mm. with a normal differential count. The E.S.R. was 9 mm/hr. C.S.F. pressure was normal with a normal Queckenstedt test. There were no cells, protein was 22 gm% and sugar was 60 mgs.%. Blood and C.S.F. Kahn tests were negative. Chest X-rays and plain X-ray of nasal sinuses showed no abnormality.

Ordinary X-ray of the skull showed no abnormality. Special views of the jugular foramen with tomography showed a destruction of the base of the skull on the right side (Fig. 1), beginning from just behind and below the tip of the petrous pyramid. The right jugular fossa had lost its outline, being partially eroded and extended. The destructive process extended backwards to involve the posterior cranial fossa behind the region of the posterior tip of the foramen magnum.

X-rays of the mastoids showed that there was bony destruction at the medial and inferior aspects of the right petrous pyramid. The tip itself appeared to have been partially destroyed. A right carotid angiogram, with the needle placed into the proximal portion of the external carotid artery, showed the occipital and maxillary branch both hypertrophied, the former much more than the latter. An abnormal vascular pattern was seen in the right sub-occipital region resembling an A-V malformation (Fig. 2). A large draining vein at the posterior region was seen in sequential films. It revealed a tumour pattern of 10 cm. by 6 cm. extending from the medial margin of the base of the skull. The radiological conclusion appeared to be consistent with a glomus jugulare tumour. Other tumours that might show the vascular pattern included an A-V malformation or a very vascular secondary deposit. A diagnosis of glomus jugulare tumour was made. No biopsy was performed because of the danger of bleeding after even a relatively minor operation.

As the tumour was very extensive and surgical removal not possible, she was given deep X-ray therapy. No apparent change in the size of the tumour was noted during the course of radiotherapy. When reviewed one month later, there was no progression in the neurological symptoms. When last seen by one of us (T.P.D.) on 5th October, 1971, she was feeling well and had returned to her work as a rubber tapper. Her voice was no longer hoarse. She had no tinnitus but there was slight deafness of her right ear. There was no dysphagia, though she had to chew her food slowly before swallowing. She had no complaints regarding her vision.

On examination she appeared in good health. There was no lump in the neck. The only cranial nerve lesions still present were right VIII (slight hearing defect), IX and X (minimal loss of elevation of soft palate), XI (slight weakness of sternomastoid and trapezius) and XII (mild wasting of the right half of tongue and inability to protrude tongue out of mouth). The ear drum was normal and so were the fundi. There were no

## GLOMUS JUGULARE TUMOUR



Fig. 2a. Right carotid Angiogram  
Arrow shows early arterial phase of tumour



Fig. 2b. Arrow shows late arterial phase  
of tumour

enlarged lymph nodes. The rest of the examination was essentially negative.

### Discussion

In the excellent reviews by Bickerstaff and Howell (1953), Hanson, Crawford and Cavanagh (1953), it is noted that the tumour is four to five times commoner in women than in men. The long history of symptoms was stressed. About half of the patients had symptoms for more than ten years. The presentations fall into two main groups. The majority of patients reviewed present with aural symptoms, consisting of tinnitus and progressive deafness. Otorrhoea and vertigo are less frequent. Pain in the ear is not common. A striking feature is aural bleeding which sometimes occurs after coughing, sneezing or straining or following interference. Frequently, a red bulging drum is noticed and myringotomy invariably resulted in profuse bleeding. Also a polyp may be seen in the external auditory meatus. Sometimes this follows a myringotomy which permits the tumour to bulge through the drum or it erodes spontaneously through it. The only neurological involvement at this stage may be only a facial nerve palsy.

The other group of symptoms consists of neurological involvement which usually follow several years later. Dysphagia and hoarseness usually make

the patients seek medical aid. The ninth, tenth, eleventh and twelfth cranial nerves are most frequently affected; much less common, the sixth and fifth cranial nerves may be involved.

Sometimes, neurological and aural symptoms appear together. Much less commonly, neurological symptoms precede aural manifestations (Revilla, 1948; Capps, 1952). Intracranial spread, usually into the posterior cranial fossa, is indicated by ataxia, incoordination and nystagmus. Sometimes the pyramidal tract may be involved. Raised intracranial pressure may be associated. Intracranial bruit and pulsatile mass below the mastoid and behind the ear are seen in some patients.

In the patient reported here, both aural and neurological symptoms appeared more or less simultaneously. There was a pulsatile lump on the right side of the neck. No aural polyp, haemorrhage or discharge were present. In the second case of Poppen and Riemenscheider (1957), there was no haemorrhagic manifestations. A pulsating tumour was found anterior to the mastoid. In Revilla's patient, bleeding occurred only after exploration of the cerebello-pontine angle. Two patients of Bartels (1949) had no aural bleeding, but both had aural symptoms only.

The possible differential diagnosis consists of



an angiomatous meningioma, an acoustic neuroma, a nasopharyngeal carcinoma. In the early stages, it may be difficult to differentiate them from a tumour jugulare. In most cases, the lower cranial nerve palsies with external aural symptoms exclude other possibilities. Nasopharyngeal carcinoma is common among Chinese. In this Chinese patient, it could have been difficult to decide but the lack of positive findings in the pharynx and post-nasal space, along with a pulsatile tumour, make such a diagnosis extremely unlikely. Besides, the lower cranial nerves are usually involved late in nasopharyngeal carcinoma and headache becomes very prominent by then. This latter symptom was conspicuously absent in this patient. Other diagnosis, like a racemose angioma, may present a problem (Bickersstaff and Howell).

With better awareness and more refined investigations, glomus jugulare tumours are being diagnosed at an early stage. Special tomography has been used by Kim, S.K. and Cop (1966) and Jane Metz Strickler (1966) to display the jugular foramen. Kohut and Lindsay (1965), in an effort to determine the suitability for surgical removal and to determine tumour of middle ear origin from that which arises from the jugular fossa, employed subtraction angiographic techniques with tomography to great advantage. Gejrot and Lauren (1964) stressed the importance of retrograde jugularography preoperatively in detecting the presence

of an intravascular involvement by the tumour of the jugular bulb and the jugular vein.

The treatment in early cases, if possible, is surgical excision (Kim, S.K. et al, McSwanz, Calson, Scott, 1959). Irradiation is indicated when extensive bone resection would be necessary to remove all the tumour. In a review of 38 cases of glomus jugulare tumour concerning the current management, Rosenwasser (1967) divided the cases into three groups. Group I cases are those with intact drum membrane and a small lesion apparently confined to the middle ear space; there is a moderate conduction type of hearing loss. In Group II cases, the middle ear, aditus, antrum and mastoid bone are involved. Group III cases have widespread extension, at times intracranially. In Group I cases, transtympanic removal is advised. Exploratory endaural mastoidectomy is always done in Group II cases. Irradiation is the treatment of choice for Group III cases. The patient reported here obviously belongs to Group III and radiotherapy was selected. She remains well at the end of two years. Encouraging results have been reported for radiotherapy (Alexander et al, 1951 and Copps, 1951).

### Summary

A case of glomus jugulare tumour treated by deep X-ray therapy is reported with the patient remaining well at the end of two years. The symptomatology and literature are briefly reviewed.

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# Follicular carcinoma thyroid

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## Introduction

THYROID CARCINOMAS are for simplicity classified as benign and malignant tumours. The benign tumours are essentially adenomas and the malignant tumours of the thyroid are the papillary, follicular, medullary and the anaplastic carcinomas<sup>1</sup>. The papillary carcinomas are the more common tumours and they are usually seen in the younger age group with good prognosis — 60% survival in 10 years<sup>2</sup>. At the end of the spectrum of thyroid malignancies are the anaplastic carcinomas, seen usually in patients above 60 years of age and have a 10-year survival of 1%, though Gramer and Buckwater found a 10-year survival rate of 15%, based on a study of 59 patients<sup>3</sup>.

In the middle of the spectrum are the follicular carcinomas, which are three times as frequent in women than in men and is seen around middle and later age groups<sup>4</sup>. Macroscopically, the neoplasm varies in size, from 1 cm. to 15 cm<sup>4</sup>. The tumour may take the form of a single nodule or of a mass of conglomerate nodules. Follicular

carcinomas tend to invade adjacent structures and metastasize by blood stream, rather than to local lymph nodes. Histologically, these tumours are characterised by its tendency to form acinar structure with varying colloid content and the conspicuous absence of any papillary growth pattern. The degree of differentiation varies greatly amongst different neoplasms and sometimes to a considerable extent in different parts of the same tumour. Secondary changes, like cystic degeneration, haemorrhage, irregular fibrosis and calcification, are common. This tumour has a tendency to encapsulation, but there is usually penetration of the capsule by the groups of cancer cells.

The follicular carcinomas are unique in that the first presenting sign may be due to a skeletal deposit, the primary tumour being small and impalpable. Skeletal metastases from follicular carcinomas have been reported in the skull, sternum, long bones, pelvis and the ribs. Lung metastases are sometimes seen in this group of tumours. The bony and pulmonary metastases are highly vascular



## FOLLICULAR CARCINOMA THYROID



Fig. 1c: Scintiscan superimposed on X-ray of chest. The lump is seen at the sterno-clavicular junction and extends downwards.

swelling was growing bigger in size and was provisionally thought to be an osteoclastoma. However, radioiodine studies were done on him (approximately one year after the subtotal thyroidectomy). These showed that there was slight activity over the left side of the neck and the sternal mass took up iodine well, suggesting that it was of thyroid in origin. Drill biopsy of the sternal mass was done and it was conclusively proven to be follicular carcinoma thyroid.

As the mass was taking up iodine well, it was decided to treat him with doses of radioiodine. He was given 150 cm C of  $I^{131}$  in June 1971 and a repeat scintiscan of the neck and sternum in November showed that the mass had grown smaller. It was decided that he would be given a number of courses of radioiodine at intervals of two to three months, with replacement therapy, in between the therapy interval. The patient is doing well with this treatment.

### Discussion

Follicular carcinoma of the thyroid are well known for their bizzare presentation. In this patient,

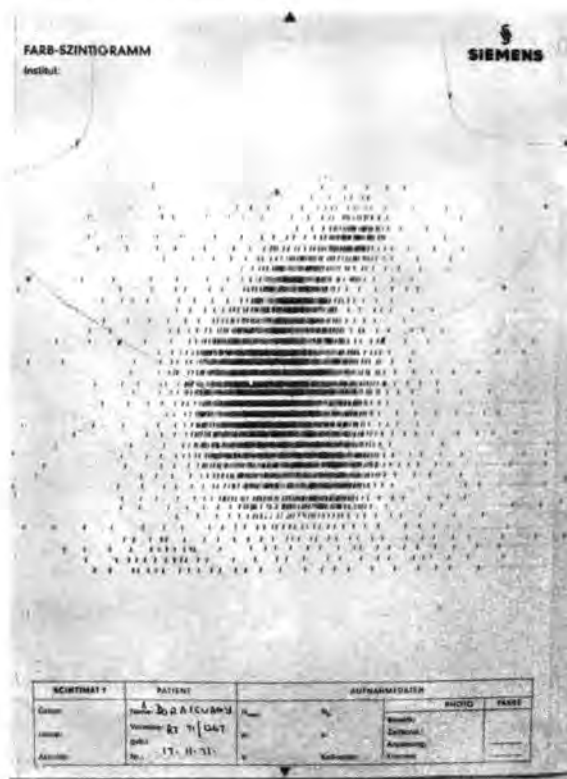


Fig. 2: Scintiscan of sternum four months after ablative dose of radioiodine. The mass appears smaller.

the mass in the sternum was thought to be an osteoclastoma and separate from the primary thyroid tumour. However, radioiodine studies and drill biopsy proved beyond doubt that the mass was thyroidal in origin. The follicular carcinomas are also interesting in that, amongst the group of thyroid malignancies, they show the highest incidence and degree of initial radioiodine uptake while mixed follicular-papillary, anaplastic and other types of carcinoma show decreasing initial uptake in that order. This fact makes it an ideal tumour for treatment with radioiodine. The choice of therapy varies from centre to centre, but it is now accepted that follicular carcinomas should have total thyroidectomy followed by radioiodine. The first total dose of radioiodine varies from centre to centre (from 100m C to 600m C), but we decided on 150m C. The interval between successive treatment varies, depending on the size of the tumour.

It has been shown that the uptake in the tumour is seldom more than 15% at first therapy dose, and as that tumour regresses with successive doses, the radioiodine uptake is reduced, perhaps by as much as 90% each time. When the uptake



Fig. 3: Scintiscan of spine showing uptake in thoracic 10 vertebrae.

has been reduced to 0.01%<sup>8</sup> and no residual tumour can be detected clinically, it is then reasonable to assume that all the tumour has been destroyed. One of the objections to this type of massive radioiodine therapy is the complication of leukemia. This is a serious complication and there are 11 published reports in literature. In Pochin's series of 192 patients treated with radioiodine, there was a 2% risk! However, this is a small proportion and it is not definitely sure whether leukemia was due to radiation therapy<sup>9</sup>.

It has been reported that rarely metastases from follicular carcinoma could present with symptoms of thyrotoxicosis. This patient, when

first seen, had symptoms of hyperthyroidism, which did not respond to anti-thyroid drugs. However, the patient was not well investigated before surgery and radioiodine therapy and we are unable to confirm this.

Lastly, we have on our follow-up a few other cases of thyroid carcinomas on radioiodine therapy and we hope to publish them at a later date, when we have a large enough series.

### Summary

A case of follicular carcinoma thyroid with metastases in the sternum, which has responded well to initial radioiodine therapy. We feel that this metastases was probably secreting excess thyroxine, but we are unable to substantiate this statement.

### Addendum

Since the documentation of this case report, the patient came for follow-up in January 1972. At this time, he complained of pain over the spine and an X-ray of the thoraco-lumbar spine showed collapse and destruction of 10th thoracic vertebrae. Scintiscan of the spine, following tracer dose of I<sup>131</sup>, showed good uptake and activity over the thoracic 10 level, suggesting that it was secondary from the follicular carcinoma.

(Fig. 3). Because of the location of the secondary and the potential danger of sudden cord compression, we decided to treat the secondary with external radiation up to 5500r.

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## Book Reviews

### MOTHER AND CHILD HEALTH

Delivering the Services

C.D. WILLIAMS AND D.B. JELLIFFE

Oxford University Press, Lon. 1972. Pp. 164

£2.20 net.

WRITTEN BY TWO AUTHORS with extensive working experience in "developing" countries, this book aims at providing a practical guide to establishing effective health care (both curative and preventive) for mothers and children. It projects the philosophy of comprehensive medical care encompassing the hospital and clinic on the one hand and the family and community on the other.

It examines the health hazards to which mothers and children are particularly vulnerable, discusses common childhood diseases, the influence of cultural patterns, measurement of health in "underdeveloped" communities and the health hazards of overpopulation. It traces the development of maternal and child health services and outlines the scope of these services. It provides detailed suggestions on the organisation of services to suit local conditions with special reference to paediatric wards, health centres, maternal and child health clinics and also gives a detailed commentary on the training of personnel.

The book contains a good selected bibliography on different aspects of maternal and child health care.

Indira Pathmanathan

**VECTOR CONTROL IN INTERNATIONAL HEALTH.** Coordinated and edited by J.V. Smith and R. Pal and published by the World Health Organisation, Switzerland.

pp. 144. £3.20. US \$8.00

IT IS A VERY useful practical guide to all those who are responsible for the control of vectors and pests at ports and airports, for the prevention of the transportation of potentially harmful arthropods and rodents from one area to another. This field is a major but very often neglected one in vector control. Special emphasis has been given to biology and control of major insect vectors like *Aedes*, *Culex*, *Anopheles*, fleas, lice and rodents, like domestic rats and mice. Basic principles for control of vectors and pests at ground installations in ports and airports and aboard ships and aircrafts are discussed.

General keys to the identification of medically important arthropods are appended. Keys to the larvae and adults are also provided for the identification of most of the medically important mosquitoes. Keys to genus *Armigeres*, however, have not been included. Good diagrams and charts which are included to supplement the keys are of great value for accurate identification of major vectors and arthropods of medical importance.

Tables of pesticide data for insect and rodent control are appended with useful instructions.

Vijayamma Thomas

**MASS HEALTH EXAMINATIONS.** Pub. Hlth. Papers No. 45 World Health Orgn. Geneva. 1971. US\$2.00 pp.99.

Obtainable thro' WHO Rep. P.O. Box 2250, Kuala Lumpur.

THE TECHNICAL DISCUSSIONS at the World Health Assembly are an annual event, though they are not part of the formal proceedings. The delegates to the assembly, as well as the representatives of associate member states and of other organisations, attend informally and not as delegates of their governments or as officials of their organisations.

The 1971 discussions were devoted to *Mass Health Examinations as a Public Health Tool*. Because of the practical importance of this subject and the growing interest in screening for the early detection of disease, it was felt that the views expressed should be made available to a wider audience. In addition to the reports of the eight discussion groups, this volume in the *Public Health Papers* series includes the background paper that served as a basis for the discussions, the chairman's address, and the joint report prepared in the light of the comments of the participants.

The background paper, by Dr. J. M. G. Wilson, presents a general review of the subject based on the comments received by WHO from governments and intergovernmental and non-governmental organisations in response to the outline document also included in the volume. The address, by Professor Herman E. Hilleboe, chairman of the technical discussions, places mass health examination methods in the wider context of health planning, the delivery of health services, and the evaluation of health programmes. In the reports of the individual groups, the problems raised in the two intro-

ductory papers are examined in greater detail, while the final report attempts a synthesis of all the views put forward in the course of the discussions.

**HISTOLOGICAL TYPING OF ORAL AND OROPHARYNGEAL TUMOURS**

by P.N. Wahi, B. Cchen, U.K., Luthra and H. Torloni. W.H.O. Geneva 27pp. US\$4.00. Obtainable thro' WHO Rep. P.O. Box 2250, Kuala Lumpur.

THE WHO INTERNATIONAL REFERENCE CENTRE for the Histological Definition and Classification of Oral and Oropharyngeal Tumours was established in 1963 at the Department of Pathology, Sarojini Naidu Medical College, Agra, India.

It has worked in close collaboration with pathologists in 11 countries to produce this latest volume in the series of tumour classifications being published by WHO. By developing uniform classifications and nomenclatures for the microscopic definition of tumours, WHO is seeking to facilitate international communication and comparability of data in oncology.

An introductory text outlines the histological considerations pertaining to the oral and oropharyngeal tissues and discusses the grading and spread of carcinomas in this region of the body. The classification itself is divided into seven major categories. Accompanying explanatory notes embody some useful diagnostic criteria, especially in regard to tumours of squamous epithelium and tumour-like conditions.

The book includes 40 colour plates reproducing photomicrographs of the main tumours and related lesions covered by the classification. A set of 52 colour transparencies is also available.