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CONTENTS

# Editorial

## HIGHER EDUCATION IN MALAYSIA

by: Lim Kee Jin

A serious problem faces any country that attempts to modernize itself through education of its citizens particularly in respect to tertiary education. Malaysia is now facing such a problem. Confronted by the urgent need to provide adequate numbers of university graduates to staff the expanding economy and bureaucracy, universities were created one after another in rapid succession until we now have 5 universities - the University of Malaya, the Universiti Sains Malaysia, Universiti Kebangsaan, the Institute Tecknologi Kebangsaan and the Universiti Pertanian. I will not discuss the problems of obtaining staff, of building and finance which are themselves immense and which can be surmounted given goodwill and time. One serious problem is the imbalance between the numbers of arts and science graduates, there being a large predominance in arts graduates. Examples of student enrolment in the University of Malaya for 1973 illustrate this point.

| | |
|---|---|
| Agriculture | 322 |
| Arts | 3002 |
| Econs. & Admin. | 1478 |
| Dentistry | 62 |
| Engineering | 689 |
| Science | 1548 |
| Law | 103 |
| Medicine | 649 |
| Education | 598 |
| Accountancy | 68 |
| Total: | 8519 |

It is natural that more students should seek admission to arts and humanities courses for a variety of reasons, partly on account of preference, partly because it is less intensive and more leisurely. Further, until recently, opportunities for advancement for the arts and humanities graduates have been better than science and technological graduates in Government service and the private sector.

Fewer students are attracted to the study of science largely because of lack of opportunities and facilities in many schools, particularly in rural areas and smaller towns. However, it is true to say that there is also a lack of interest among parents and teachers in encouraging students to take up science. While the Government is trying to persuade more students, particularly among the Malays, to take up science and technology, much more needs to be done through the mass media, through teachers and parents on a sustained basis. School heads should make greater efforts to stimulate the interest of their students by encouraging science societies and inviting scientists and technologists to actively participate in student activities. The quality of teaching of science and mathematics should also be improved and this is where the teachers have to take on the responsibility of making their subjects interesting and easy to understand.

We are also concerned that there seems to be an imbalance in the pattern of tertiary education, for there are more Universities than schools of technology and polytechnics. This, we fear, may give rise to a situation where there are more University graduates than what our economy can absorb, while at the same time, we find ourselves short of middle level technologists. That this problem is receiving the attention of Government is evidenced by the creation of the Higher Education

Advisory Council. We hope that this body will submit its recommendations early to Government and that its recommendations are given as wide a circulation as possible.

There should be a higher proportion of middle level technologists being trained as against University graduates and in order to achieve this, we consider that no new universities be created for the next few years. This will allow the existing Universities to consolidate and strengthen the existing disciplines.

Priority should be given to the formation of more polytechnics and middle level institutes of technology. This will permit a more rational approach to the development of the nation and avoid the pitfalls which some Asian countries have fallen into, of having a large surplus of University graduates, particularly in Arts and Humanities, who may be faced with lack of opportunities in employment, and who lack the training to equip them to survive in a free economy.

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# Behavioral approach in training the Mentally Retarded[1]

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## Measurement

The term "behaviour modification" refers to a technology of behaviour change based upon principles of learning developed by Pavlov, Watson, Skinner, Bandura and others. The most significant feature of the behavioural approach is its reliance upon precise and reliable ways of measuring and recording observable behaviour. This is the key to the success of behavioural modification techniques in education, medicine, industry, and numerous other fields. Without precise behavioural measurement an individual's performance cannot be accurately assessed, appropriate behavioural change programs cannot be developed, and the results of intervention cannot be meaningfully determined. Behaviour is action and therefore is readily observable and recordable. Walking, eating, dressing, laughing are be reliably reported by several observers, whereas thinking or feeling are not observable behaviours. Any reference to such acts must be based upon inference or assumption on the part of the reported and is thus subject to possible bias.[3]

Behaviourists have developed a number of measurement and recording techniques, many of which have now become standard in the behavioural research literature.

*Automatic Recording* devices provide electrical or mechanically produced records of an individual's response activities, like the number of times a pigeon pecks at a key or the number of times a child pushes a switch in response to some training situation. Such devices are common in the laboratory but not generally suited to use in the clinic, home, or classroom without technical expertise.

*Product Recording* refers to the measurement of the products of behaviour, such as the number of words spelled correctly, the number of paintings painted, or the number of biscuits baked.

*Event Recording* as the term implies, refers to the counting of discrete events of a certain type as they occur. A teacher may count the number of times a child gets out of her seat, talks out in class, hits another child, or speaks. Such recordings are easily taken with the help of pencil and paper, or a wrist counter.

*Duration Recording* refers to the measurement of the time required for a behavioural act. For example, how long does it take Jon to tie his shoe or do his homework. The most efficient tool is of course a stopwatch, or simply a wristwatch with a sweep second hand.

*Interval Recording* refers to the counting of the number of times a behaviour occurs during a specified time interval, for example, the number of times Billy hits Susie during a one hour play period.

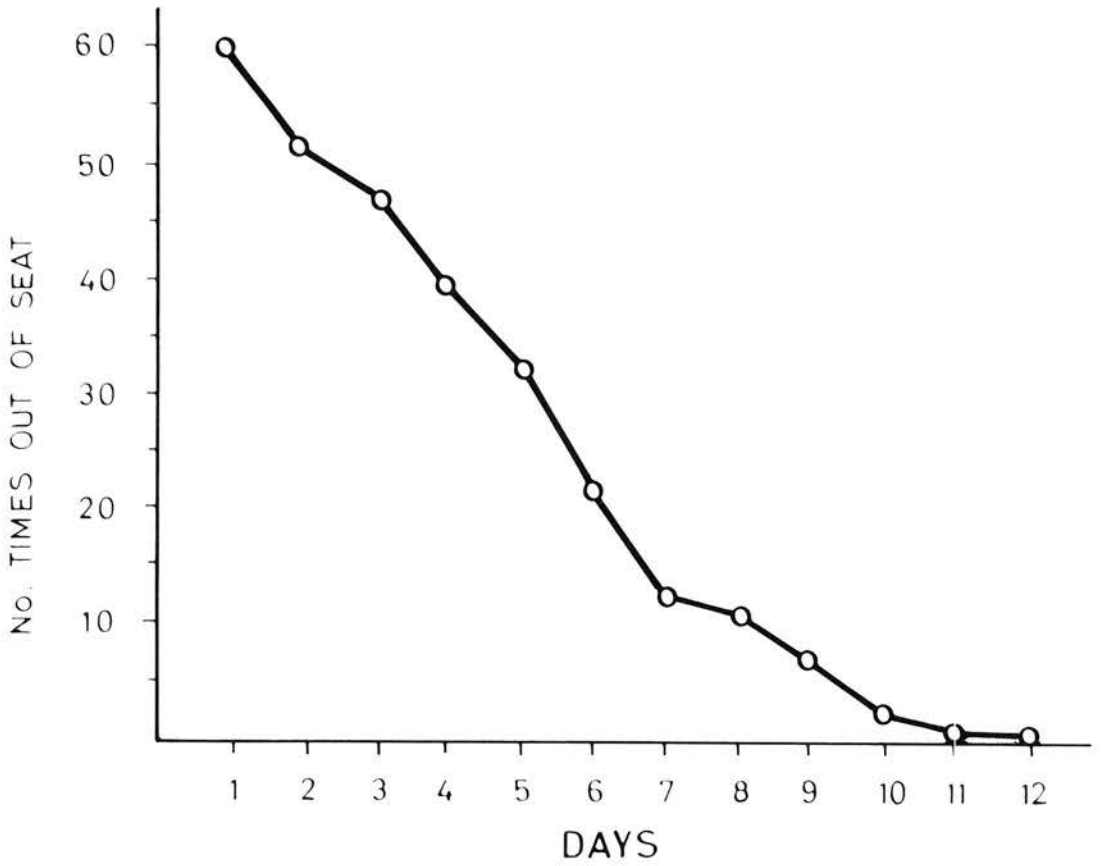
*Time Sampling* is a variation on interval recording where the observations are not made continuously but rather at spaced intervals. For example, we may not wish to sit and watch Billy and Susie for

1. Delivered at the Training Course for Teachers of the Mentally Retarded, Kuala Lumpur, 28/11/74.

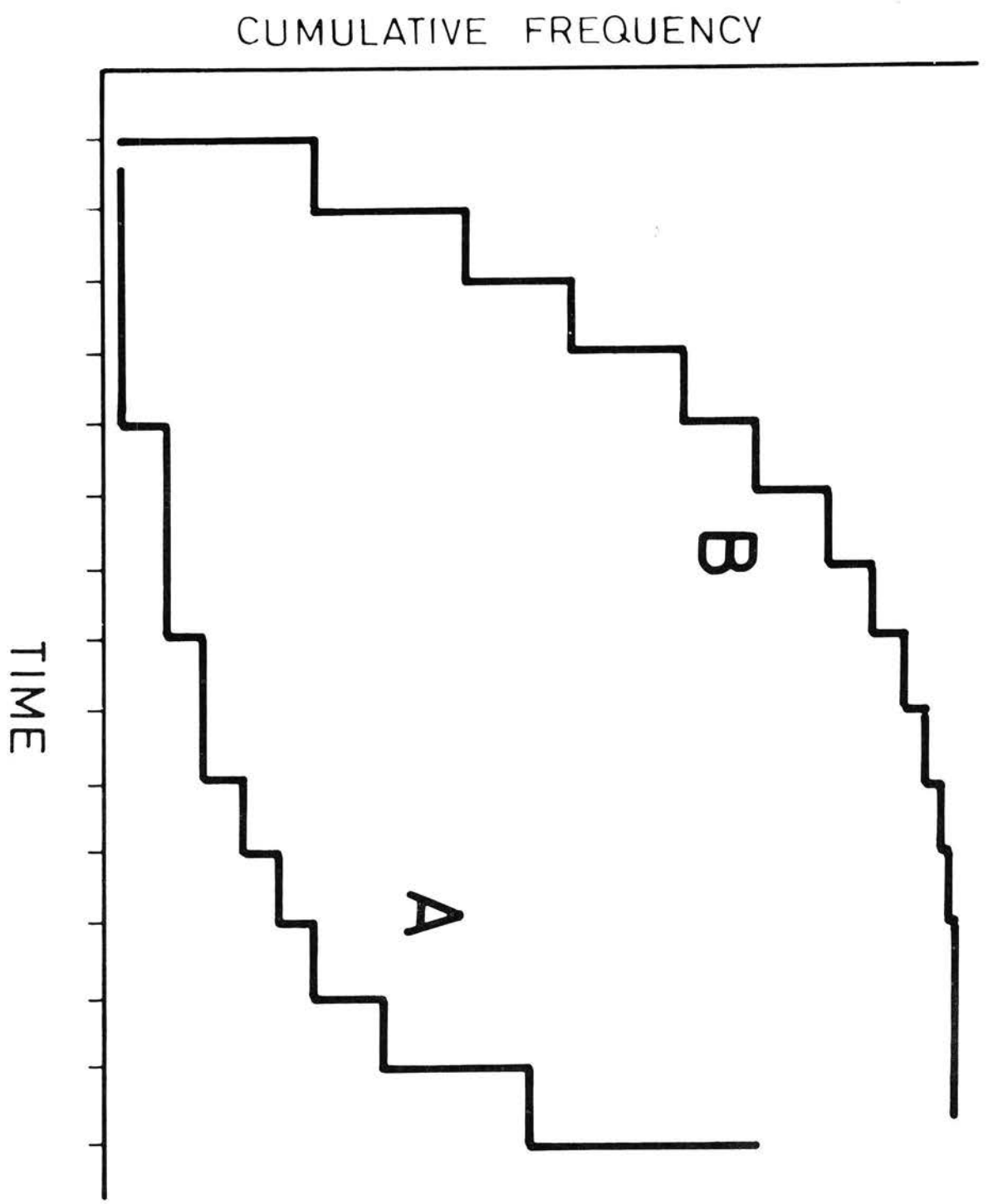
an hour so we might make an observation at the end of every 20 minute period.

It has already been stated that one of the purposes of recording behaviour is to provide an accurate assessment of the original rate of behavioural response so that we can better judge the effects of any intervention program. We refer to this as establishing the baseline. Thus, before any behaviour modification of temper tantrum behaviour can be carried out, we must know the exact number of tantrums now occuring must be known. By obtaining such a record it is possible to note when they occur, where they occur, and with whom they occur, all important bits of information if a successful intervention program is to be devised.

The significance of behavioural data is most easily appreciated when it is graphically displayed on standard graph paper. For example, if we are interested in knowing whether Billy's ability to stay in his seat during school is improving, we have only to look at the graph in Fig.1 below to note that definitely it has.



The noted behavioural researcher B.F. Skinner developed a recording technique which in certain situation improves upon the conventional graphing technique. Cumulative recording involves the graphing by sequential time periods of the cumulative sum of behaviors (see Fig. 2). Thus, a progressively



accelerating curve (A) would tell us that the behaviour is increasing in rate of occurence while a progressively decelerating curve (B) would tell us that the behavior is decreasing.

## Basic Principles

The fundamental principles of the behavioural approach is that behaviour is determined by its consequences. Such behaviour we call operant since the organism operates on the environment, and the environment operates on the behaviour and the behaving organism in turn. Thus operant behaviour is voluntary and may occur freely in the course of day to day activities. It is what happens subsequent to that behaviour, its consequences, that influences the probability that a response will increase or decrease in frequency in the future.

When the consequence of a behaviour increases the frequency or strength of a response, then that consequence is called a reinforcer. Reinforcers may take a variety of forms but their general effect is to reward behaviour. Food, money, praise, or a smile may all serve a reinforcing function. If the consequence of a behaviour is non rewarding, as in the case of punishment, or merely the cessation of reinforcement, then we would observe a reduction in the frequency or strength of the response. Such a phenomenon is called extinction. In the case of withdrawal of previous reinforcement, the extinction may be slow and gradual, whereas in the case of punishment, the extinction may be quite rapid and sudden.

Reinforcers that have an innate and immediate ability to "reward" behaviour are called primary reinforcers since they derive their ability to influence consequences through their satisfaction of basic biological needs. However, many reinforcers exist which have acquired the ability to reward behaviour through their repeated association with primary reinforcers, for example money, or praise. The ability of a reinforcer to influence behaviour depends upon a person's need or continued desire for the reinforcer. A hungry child will be more responsive to food as a reinforcer than will a child who is continually fed or satiated. Similarly, if a teacher praises her pupils continuously, the reinforcing value of her words may diminish unless varied with other forms of reinforcement. As in all forms of behaviour excessive repitition is boring, not rewarding.

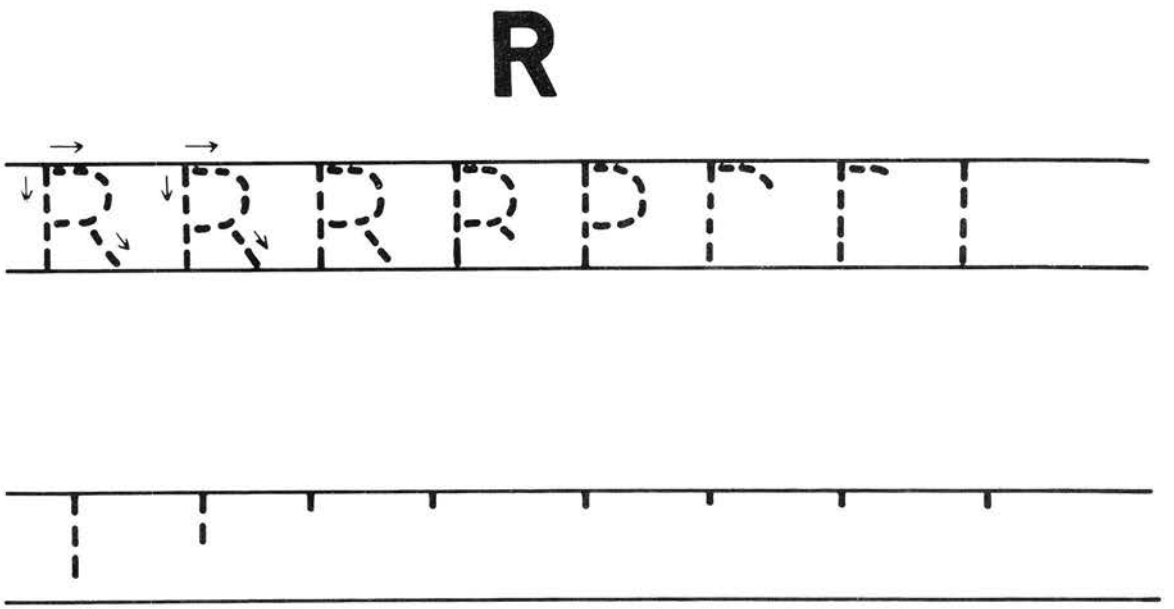
While the giving of a reward is the most obvious way of reinforcing behaviour the taking away of a punishment or something had can also have a 'reinforcing' effect. These consequences, called "negative reinforcement" are rewarding because "it feels so good" to stop feeling so bad. Such behaviour is quite common and can be seen daily on the nations highways. A police car passes a driver and he notes with satisfaction than he has avoided arrest by driving at the prescribed speed limit. Indeed, it can be said that most law abiding behaviour works on the principle of negative reinforcement, that is, it is rewarding to avoid punishment. At the same time this points out the drawback of negative reinforcement in that its use often leads to avoidant behaviour, e.g., we are rewarding people for not doing things rather than doing. A baby giving a smile when picked up by her father is a positive reinforcer for the father and leads to positive behaviour on his part. A child ceasing to cry when picked up by a parent is also reinforcing (negative) but can lead the parent to feel punished or angry and the baby to learn to cry in order to get attention.

*Operant Conditioning.* Having an understanding of the principles by which the consequences of behaviour influence its future probability, the behaviour modifier is in a position to increase or decrease selected behaviours by a process of systematic arrangement or management of the consequences. This involves three steps:

1. defining the behaviour
2. determining the baseline level of the behaviour
3. delivering reinforcement following the behaviour to increase its frequency.

As a scientific check on whether or not the reinforcer actually caused the behavioural change, a fourth step can be added, called verification, or reversal. In this stage the original conditions (without reinforcement) are reintroduced to determine if the behaviour returns to its original baseline level. Of course, in many treatment conditions, such a test of the treatment procedure may be waived.

*Shaping.* When the desired behaviour is beyond the immediate capabilities of the child, it is often possible to gradually train a repetoire of more simple responses which increase in difficulty or demand, thereby progressively approximating the desired response. In a sense, shaping is merely operant conditioning where the baseline is progressively shifted upwards as our expectations regarding the child's performance increase. For example, we may reinforce non-disruptive behaviour in a child if he goes




first only 5 minutes, then 10 minutes, then 20 minutes, etc. Gradually we "shape" his non-disruptive behaviour until he may be able to go an entire day, without annoying other children.

Since it is not always possible to have sufficient staff to provide on the spot reinforcement for a child's every desirable behaviour, systems for delayed reward have been developed, to be used especially with children where continuous supervision may not be required. Such systems, called token systems, work according to the same principles as monetary systems and have all the advantages and limitations e.g. inflation of monetary systems. In brief, the child performs a desired behaviour and as reinforcement, receives a token (poker chip, card, or similar "token") which can then be cashed or redeemed for some toy sweet, or desired priviledge. The system therefore provides greater flexibility in individualizing the reinforcement, provides a mechanism for delay of reinforcement, and enables the child to function increasingly independently.

*Punishment.* When the consequence of a behaviour is aversive and leads to a reduction in the response, then that consequence is called punishment. It cannot always be inferred that if a behaviour decreases rapidly following an aversive act, then the act is punishing. Punishment is generally quite effective in rapid response reduction, but not without some potentially undesirable effects, leading some clinicians to advise against its use except in unusual circumstance (e.g. where a child's life or health may be in danger). Others disagree that punishment is always undesirable as a planned consequence, especially if the punishment itself is not extreme in its aversive effects, e.g. deprivation of a priviledge.

## Training the Retarded

The principles outlined above are readily applied to the care and training of the retarded as evidence by the outstanding success of behaviour modification programs for the retarded child. Every successful program begins with *selecting the target behaviour:*

1. define the behaviour objectively and to specific
2. make certain the behaviour is relevant
3. make certain it is similar to something the child already does.

Care should also be exercised in the *selection of reinforcers,* especially since "one child's reinforcer may be another child's extinguisher". Individuals differ and tastes differ over time. As a general rule, watch the child play and determine what are his or her favourite toys, or sweets, or anthing having a high degree of attractiveness. Have several alternative

reinforcers available in case he/she satiates on the original choice and vary the menu occasionally.

When *applying reinforcement* it should be remembered that behaviour will change if the child is reinforced:

1. only when the desired behaviour is performed
2. immediately following the behaviour, and
3. frequently when learning a new behaviour

*Shaping* programs are especially important in the training of the retarded since even the most basic social and self help skills must be trained in progressively approximated fashion. This has given rise to a series of behaviour *prompting* techniques which guide the child's initial response in the desired direction toward the behaviour goal. For example, the "fading" technique shown in Figure 3 is used to teach children to print.

Another variation on the *shaping* technique is *chaining*, where the child is taught a series of discrete steps which, if chained together lead to the successful completion of a target behaviour. For example, in learning to tie a shoelace, the child is first reinforced for putting on the shoe, then for pulling the strings with both hands, then for crossing the strings, then for looping one string about the other, etc.

The importance of record keeping and the techniques used by behaviourists for recording behaviour have already been discussed. It should be reiterated however, that record keeping is especially crucial in the training of the retarded. When we say "John is doing well" it is a far less meaningful statement as to his progress than if we were able to say "John is on step 6 of the dressing program and step 3 of the printing program." With this statement we know exactly where John is relative to his beginning performance, and therefore we know exactly how much progress he has made. Graphs or other displays are especially useful, not only for the rapidity with which they communicate information to the therapist, but also in terms of the feedback, and therefore, *reinforcement* they provide to the child. Nothing succeeds like success, and there is nothing more rewarding to a child than to see visible evidence of his/her progress.

In large part the benefit of behavioural approaches derives from the structure and guidelines provided to the teacher for the management of the retarded child. As any educator knows, it is relatively easy to teach a child, if you can get him to school, make him stay in his seat, and remain attentive and well behaved for several hours. In most cases the retarded child is incapable of such standards. One teacher had considerable difficulty getting the children to behave in the bus on the way to school. She was becoming frantic as their behaviour grew increasingly riotous over the 50 block route to school. In desparation she sought advise with the usual challenge that accompanies such requests, "Well, I've a situation I'll bet your behaviour modification won't stop!" and she explained her dilemma. Actually the situation was quite straight-forward. Having *defined the behaviour* (disruptive noise) she was asked to make a note the following day as to how many blocks the children could go without making noise *(the baseline)*. The following day she reported that "the little devils could not go more than 2 blocks without making a racket!" At this point, she was asked what the children would consider a special but inexpensive treat *(the reinforcer)*. The reply as, of course, "sweets". The next step was to devise an appropriate *program*. It had to be easily administered by the teacher, be within the immediate capabilities of the children, and provide for a progressive *shaping* of their behaviour in the direction of the desired *criterion*, e.g. no disruptive noise for the duration of the trip. It was suggested that on the first day the teacher instruct the children that if they could be quiet for a distance of 3 blocks they would each receive a sweet. The next day she reported that the goal had been achieved without exception. The following day the children were required to go 5 blocks. Again success! The third day 10 blocks, and so on. Within a week the teacher was enjoying a rather quiet uneventful ride of 50 blocks each way for a total cost of a penny sweet per child per ride *(criterion success)*. Within a few weeks she was able to reduce the reinforcement to 1/day and finally 1/week. By the end of the year, reinforcement was no longer required but the teacher wisely "surprised" her riders now and then with an occasional sweet. We have come to call these subsequent rewards "booster shots".

The same approach can be used to train a variety of skills to the retarded child from toilet training to show-lace tying, from dressing onself, to feeding oneself. In the case of more borderline children it is an especially effective approach in the development of academic programes.

The guidelines for the development of such programs are quite simple[3]:

1. Be specific in defining the target behaviour to be learned, e.g. "washing face and hands"

rather than "cleanliness".

2. Break the total behaviour down into as many discrete steps as necessary. Go through the behaviour yourself to determine the number of steps required.
3. Arrange the discrete steps in a logical sequence from the easiest to the most difficult, and so that each step prepares for doing the next.
4. Decide upon what criterion must be achieved before going on to the next step. How many successes, or how long to achieve success before you move on?

### Putting on Dress[4]

1. For the dress on child stopping just below the chest (Hold the garment in position, then give the direction "Susie, dress down")
2. Put dress on child, stopping just above the chest.
3. Put dress on child stopping at top of child's head (child pulls it over and down).
4. Put dress on child, stopping at elbows
5. Put dress on child stopping at wrist
6. Hand the dress to the child

### Putting on Shoes[4]

1. Place shoe just off edge of heal (Direction, "John, put shoe on")
2. Place shoe on up to the arch
3. Place shoe on at ball of foot
4. Place shoe at toes
5. Place shoe next to child's foot

The behavioural approach has been proven to be of significant value in increasing the effectiveness of treatment programs for the mentally retarded. Retarded children can be taught new skills and the behavioural approach has provided the special education teacher with the means for accomplishing this worthwhile goal.

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# Review of tuberculosis among the Orang Asli (Aborigines) in West Malaysia from 1951-1970

by

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## SUMMARY

A tuberculosis control programme among the 55,000 isolated Orang Asli (Aborigines) in West Malaysia is described. This programme is integrated with the medical service provided for these people. There is a central base hospital which has access by helicopter to numerous deep jungle medical posts and is in wireless contact with them. An attempt is being made to give B.C.G. to all Orang Asli under the age of 25. A mass mobile X-ray machine, flown, round the jungle by helicopter, is the principal instrument in finding new tuberculous patients. The incidence of tuberculosis is found to be highest in the most isolated deep jungle communities and is twice as high in men as in women. The incidence of the disease increases with age. Patients suspected of having contracted it are brought out of the jungle to the base hospital for diagnosis and treatment. Details of the treatment regimes given to over 800 Orang Asli are described, together with the relationship between the length of hospital stay and the ultimate state of the patient. The incidence of drug reactions and relapses is given. An attempt is made to justify the cost of the programme.

## INTRODUCTION

The aborigines in West Malaysia are now referred to collectively by the Malay ethnic name "Orang Asli' which, translated into English, means 'original people'. There were 55,000 Orang Asli at the time of the 1969 census, and an increase of 2.6% per annum since the census taken in 1961. There are 18 Orang Asli ethnic sub-groups, fourteen of which have their own distinct language. These belong to one of the three main groups, the Senoi, the Aborigine Malays or the Negritos. Most are animists by religion. Economically the Orang Asli fall into three categories, the deep jungle nomads, the deep jungle settled communities and the jungle fringe-settled communities. Only 2% of the Orang Asli are nomadic; they have no settled agriculture but live on jungle roots supplemented by what they can catch by hunting and fishing. The deep jungle settled people account for 35% of the Orang Asli. These practise shifting cultivation, felling and burning areas of jungle each year and planting cassava, hill rice, maize and millet. They hunt with blow-pipes, using poisoned darts, and catch animals in traps. The remaining Orang Asli live in jungle fringe areas or in settled villages outside the jungle. Most of them continue to hunt and fish in the jungle and practise shifting cultivation, but many of them also have smallholdings, rearing hens and goats, and some own rubber trees or coffee plantations.

The Orang Asli medical services are provided by the Malaysian Government and the Ministry of Health encourage these people to make use of the clinics and hospitals provided for all races in the country, when these are available near their homes. The treatment of Orang Asli living in areas remote from other health services is undertaken by a medical division of the Department for Orang Asli Affairs.

which is also responsible for environmental and preventive health measures in the whole of the Orang Asli population. The base hospital at Gombak near Kuala Lumpur has accommodation for 400 patients. There are 120 deep-jungle posts, 65 of them manned by trained Orang Asli personnel and the remainder by part-time medical aids; all 120 are in two-way radio contact with the Hospital at Gombak. Adequate funds are available for this service, details of which have been given in a previous paper (Bolton 1968).

## METHODS

a) *Diagnosis of tuberculosis by Mass X-ray*

The principal method of detection of pulmonary tuberculosis among the Orang Asli has been by Mass X-ray. The initial Mass X-ray was started in September 1961. A machine was borrowed from the Malaysian National Tuberculosis Centre for two months and was used for over 3,000 Orang Asli accessible by road. In July 1962 the Department took delivery of a Phillips Mobile X-Ray Unit (Model R.R.I. with Odelca camera), taking 70mm. chest films. The unit weighed 1,200 lbs and the generator 260 lbs and with these mounted on a three-ton lorry, the Orang Asli living in jungle fringe areas accessible by road were X-rayed. To reach those living in deep jungle areas the X-Ray machine was flown in sections by helicopter into the 120 jungle medical posts. Arriving at a jungle clearing, the X-ray machine was reassembled on level ground, usually the bamboo helicopter landing-pad, and all the Orang Asli in sight X-rayed. This done, the X-ray staff went into the jungle and called in any others living within six miles of the post. In the evenings the the X-ray team showed cine films and during the long interval in the middle of the film show, the audience was checked to find anyone who had not yet been done. These were then given chest X-rays before the film show continued. Those who came voluntarily for X-ray were given a small packet of tobacco as a reward. The length of time the X-ray machine was left at each jungle clearing was largely dependent upon the availability of helicopter support, but usually the team and equipment were moved on to another jungle location after one week.

At first the X-ray team was under the supervision of members of the Peace Corps assisted by four Orang Asli medical staff. Unfortunately, an attempt to move the X-Ray machine by boat to visit riverine villages was less successful. On the 21st March 1963 the machine was left in a small boat near the mouth of a river on the east coast of Malaysia. While the Peace Corps volunteer and his team slept peacefully on the bank, the boat was swamped by the rising tide and sank. The saline water damaged the X-ray machine beyond repair and it was not until May 1964 that an identical mobile X-ray unit was received as a replacement. The new machine was manned by four Orang Asli staff and is still in use to-day (1971). Since October, 1970, the Department has had the use of a second machine which is mounted on a vehicle and serves to X-ray the Orang Asli in the jungle fringe areas, leaving the first machine for use in the deep jungle.

The frequency of the X-ray surveys and the areas visited have of necessity followed an irregular pattern. Visits to deep jungle have been dependent upon the availability of helicopters. Between 1964 and 1968, when there were large capacity R.A.A.F. helicopters stationed in West Malaysia, the X-ray unit was moved extensively in these deep jungle areas. Following the transfer of these helicopters to Vietnam, there were none available for two years. Since 1969 there has been only limited helicopter capacity, using R.M.A.F. Sikorsky helicopters. The transport of the X-ray machine and team into jungle clearings and the evacuation of patients from these places provides the pilots with valuable operational experience.

Initially the Orang Asli came willingly to be X-rayed. If they did not come out of curiosity, they were attracted by the film show in the evening. But, subsequently, on finding that an abnormal X-ray led to pressure being put upon them to go to hospital a number were reluctant to be X-rayed. This problem in being overcome by employing staff to persuade and convince them.

The mass miniature X-rays were read initially at the National Tuberculosis Centre in Kuala Lumpur. Each X-ray was read separately by two doctors in the Centre; those picked out as possibly abnormal were then re-examined by the two doctors together. Then those selected as probably abnormal were examined by the authors and where possible compared with previous X-rays of the patient. We excluded the X-rays of patients where there was no disease progression, since a previous X-ray, and the lesion and thought to be inactive or of non-tuberculous origin. The remainder were put on the 'wanted' list and the patients called into the Orang Asli Hospital, Gombak for further investigation and treatment.

Persuading Orang Asli with suspicious X-rays to come to hospital is a long and painstaking process, especially when the patient is symptom free. When he eventually decides to come, it is usually only on condition that he is allowed to bring his whole family with him. Only when it is certain that the patient is willing, can a helicopter be requested to lift him and his family out of the jungle. The airlift usually takes place when there is next a helicopter on a routine flight in the vicinity of the patient's home. There is often a delay of several months between the patient first being called and his arrival in hospital.

There is a difficulty in identification of many Orang Asli patients sought, following an abnormal X-ray, as in any village there are several people with the same name. Nearly all the eldest children are called 'Along' and subsequent siblings are named according to the order of their birth. To add to the confusion, most are known by several names and they change them frequently. Whereas in jungle fringe villages the Orang Asli, in common with the rest of the population, have identity cards, those living in the jungle areas are not issued with them. It is often difficult to decide which of several people in a village is the person wanted for an abnormal X-ray, and sometimes more than one is called for re-X-Ray before the T. B. suspect is found. Recently, to help in identification, all T.B. patients are photographed holding a board with their name and case number written on it (Fig. 1). Also, any ill-looking Orang Asli attending mass X-ray are photographed.

Besides the mass X-ray in the jungle, routine X-rays are taken at the Gombak hospital of all patients, their relations and any Orang Asli visiting the hospital for whatever purpose. During the initial mass X-ray in 1961-1963 and again in 1965, over half the total Orang Asli population over the age of nine were X-rayed by these means. Subsequently, between 18% and 33% of the population have been X-rayed each year, as shown in Table No. 1. By March 1971 those over the age of nine had been X-rayed on an average of 2.7 times.

b) *Other methods of diagnosing tuberculosis*

Prior to 1970 the National Tuberculosis compaign, covering the whole of West Malaysia, operated a number of mobile mass X-ray units. However, in 1967 only 13% of the sputum-positive cases of tuberculosis were picked up by this means. A further 13% were picked up from mass X-ray static units in hospital from a total of 60,000 X-rays. It was decided that not only was the mass X-ray a very expensive method of finding new tuberculosis patients but, also, what was more important, a large proportion of the medical officers' time was monopolised by following up shadows in M.M.R. X-rays. For these reasons the mobile mass X-ray was discontinued nationally after 1969, and resources are now concentrated on examining the sputum of everyone who has had a productive cough over more than two weeks (Ministry of Health Malaysia 1971).

The problem with the Orang Asli is different from other Malaysians in that the majority of the Orang Asli try to hide their disease. Even in advanced cases of tuberculosis the patient will often not admit to any symptoms or, at best, admits to a cough for three days. Although facilities are available at the jungle medical posts to collect sputum and make slides, which are later examined in a government hospital, few new cases are detected by this method. Sputum slides taken in the jungle are useful, however, in the follow-up of old tuberculosis patients, and also to confirm the diagnosis where the medical assistant has found a patient with signs of advanced disease. Among the Orang Asli, 52% of new patients with tuberculosis since 1962 have been found from the mobile mass X-ray and a further 10% from routine X-rays taken by a static mass X-ray unit in hospital. Haemoptysis is the only symptom of pulmonary tuberculosis that really frightens the Orang Asli, and 12% of new cases presented with this symptom.

c) *Treatment methods*

All Orang Asli with tuberculosis are treated initially in hospital. Those with M.M.R. X-rays suggestive of tuberculosis are also admitted to hospital for further investigation. Tubercle bacilli are carefully sought by sputum examination before starting treatment. Where the sputum is repeatedly negative but the clinical signs. Mantoux test and latest X-ray are suggestive of a tuberculous lesion, the patient is given a two week course of antibiotic, usually tetracycline. This gives time for further sputum examination and for patches of pneumonitis, which are very common in the Orang Asli, to clear. The patient is reassessed clinically and radiologically three weeks later. If there is no sign of improvement at this stage, the patient is usually started on anti-tuberculous therapy. The diagnosis of tuberculosis is made retrospectively if the lung lesion clears after a course of I.N.A.H. and P.A.S.

Where an Orang Asli has refused to come into hospital for investigation of an abnormal X-ray, no anti tuberculous drugs are given to him as an outpatient unless a positive sputum has been obtained. It is felt that an unco-operative patient is unlikely to take treatment for a sufficient length of time and any such half measures might lead to a resistant strain of tubercle bacilli developing. Rather than attempt to treat an unco-operative patient where the diagnosis is uncertain, treatment is withheld in the hope that the patient will later agree to come into hospital for investigation and treatment.

The therapy routinely given is daily I.N:A.H. 300 mg., P.A.S. 12 grams, and Streptomycin 1 Gram. In patients over 40 years, the Streptomycin is reduced to 1 Gram on alternate days. Provided there is no sign of toxicity, these drugs are continued for the duration of the patient's hospital stay. Patients who are sputum positive are usually given six to eight months in-patient treatment and whenever possible kept in hospital until their sputum has converted to negative and their cavities closed. Sputum-negative patients are given six to eight weeks in-patient treatment in order to impress upon them the gravity of their disease and to teach them to take their medication regularly. Those from deep jungle areas are usually kept in hospital for longer periods. Once they have settled down in hospital, it is safer to keep them longer rather than risk the patient not taking the drugs on his return to his inaccessible jungle home. Less than 5% of patients absconded from hospital; the highest figure was among patients from nearby states, who could easily jump on a bus to reach their homes.

Twenty-seven patients were treated initially with thiacetazone in place of P.A.S. but this drug is no longer used routinely, following two severe skin reactions. Twenty-one patients who were insensitive to primary drugs, as judged by persistent positive sputum and failure of their lesions to improve radiologically were later treated with secondary drugs. The earlier cases were usually given ethioamide, pyrazinamide and cycloserine; the later cases ethambutol and rifaden.

Only eight patients were treated with surgery at the Lady Templer Hospital. The operations were successful but the stories that were told when the Orang Asli patients returned home stopped others from going to hospital even for medical treatment.

No restriction is placed on the physical activity of in-patients. They would not stay in bed if ordered to do so unless they were too weak to walk. Patients are given normal hospital diet, supplemented by extra protein if necessary. Relations are allowed to stay with the patients. Breast-fed babies are not removed from their tuberculous mothers and are given I.N.A.H. prophylactically, as are all other children accompanying open tuberculosis patients, for a minimum of six months.

On discharge from hospital the patients are given I.N.A.H. and P.A.S. to take and are visited monthly by the medical assistant from the nearest jungle medical post, who ensures that drugs are being taken and replenishes them if necessary. The outpatient treatment is continued until the lesion is considered to be inactive and radiologically stable for eighteen months. Should the patient miss the mass X-ray visit to this village, he is kept on chemotherapy until he is eventually X-rayed again and his lesion thought to be inactive.

The only period when it is certain that the patient has taken his drugs is the time of in-patient treatment (Graph No.1). The total period of treatment (Graph No.2) is the length of time the doctor has instructed the patient to take his drugs. Although it is believed that the majority continue their chemotherapy as outpatients by a check of the number of I.N.A.H. and P.A.S. tablets left in the patient's care, made monthly by medical assistants, a few, by re-exacerbation of their disease, show that they have stopped taking their drugs.

d) *Control Methods*

Large scale innoculation with B.C.G. vaccine was started in 1961. All Orang Asli under the age of 25 without a B.C.G. puncture mark are innoculated by travelling health teams, without prior Mantoux testing. In addition, all patients admitted to the Gombak Hospital are given a Mantoux test, those found to be Mantoux negative - and all new-born babies - are given B.C.G. Innoculations are currently given at the rate of 5,700 per annum: this is 11% of the whole population or 18% of the population under the age of 25. In many of the villages, the children disappear in the undergrowth at the sight of a hypodermic needle. Since 1970 B.C.G. has been given by jet injection, using the Schuce "Fan Jet". This is practically painless and much more readily accepted by the Orang Asli.

Some degree of segregation of open cases of tuberculosis has been possible. Where the patient with tuberculosis does not agree to come into Hospital, the relations often agree to build a separate

house, so that at least at night he is kept away from them.

## RESULTS

### a) *Introduction*

This survey of tuberculosis in the Orang Asli is based on information from two sources:—

i) 93,373 X-rays taken between 1961 and 1971
ii) 1,225 new cases of tuberculosis diagnosed from 1951 to 1971

All admission books of hospitals in West Malaysia have been examined and details of Orang Asli admitted extracted. Details are given in Table No. IV. Although all these cases are included in the survey in respect of age, sex, ethnic group, incidence and symptoms, only 846 patients, 541 with positive sputum and 305 with negative sputum, are included in the examination of the clinical and radiological findings (Tables No. VIII to XII and the three Graphs refer). The remaining 379 patients were excluded from the analysis of clinical and radiological findings for the following reasons:—

81 patients with non-pulmonary tuberculosis
184 patients with pulmonary tuberculosis diagnosed after 1968, where there was insufficient time for follow-up after the statistics were analysed.
114 patients, mostly diagnosed before 1960, who were either not treated by the authors or whose X-rays and notes have been destroyed.

### b) *Analysis of mass X-ray*

Details of the mass X-ray are given in Table No. 11. 2,911 (4.1%) of the 71,748 X-rays taken were picked out as possible cases of tuberculosis. All abnormal cardiac X-rays and pulmonary conditions unlikely to be tuberculous were not included in this figure. Out of these 2,911 patients with X-rays showing suspected tuberculosis, 1,159 were known old cases of tuberculosis. Of the remaining 1,752 patients, a further 1,379 were investigated radiologically and with sputum examinations where necessary. Of the 1,379 patients so investigated, 483 were later diagnosed as new cases of tuberculosis. It will be noted from Table No. 11 that of the 373 patients remaining from the total of 1,752 whose abnormal X-rays were not further investigated, 98 (3%) died prior to being investigated and the remaining 275 (9%) are still on the 'wanted' list for a further investigation.

Also in Table No. 11 there is a column showing an amended figure of the prevalence of new cases of tuberculosis, to include those patients whose abnormal X-rays were not further investigated. Of the 1,379 new patients with abnormal X-rays investigated, 483 (35%) were subsequently diagnosed as fresh cases of tuberculosis. 35% of the number of cases not yet further investigated (373) has been added to the number of new cases of tuberculosis, to give this amended figure of the prevalence shown in Table No. 11.

In the initial mass X-ray in 1961-1963, there was a prevalence of 2.0% new cases of pulmonary tuberculosis nearly half with positive sputum. As shown in Table No. 11 this prevalence has fallen to an average of 0.5% from 1965 onwards. The prevalence of new tuberculosis patients varies in different parts of the country. In both the mass X-ray findings and the analysis of all tuberculosis patients given in Table No. V the prevalence of tuberculosis is highest in the State of Kelantan in the Temier subgroups, where they all live in deep jungle. Prevalence is lowest in the lowland groups living in the States of Selangor, Negri Sembilan and Johore. In Selangor, where it has been possible to X-ray over 50% of the Orang Asli population annually, the prevalence of new cases has fallen from 1.4% in 1962 to 0.2% since 1967.

### c) *Age and sex incidence of tuberculosis*

As shown in Table No. VI, the age and sex distribution of the patients admitted to the Orang Asli Hospital, Gombak, is the same as that of the whole Orang Asli population, suggesting that at all ages they are equally susceptible to the disease. However, among the tuberculosis patients there is a marked sex and age difference, the incidence being twice as high in males compared with females, and in both sexes increasing with age. Only 5% of the tuberculosis patients are in the 0–10 age group, to which 39% of the Orang Asli population belong, and 28% of the new tuberculosis patients are over the age of 40, whereas only 13% of the Orang Asli are in this age group.

### d) *Radiological appearance*

The radiological appearance prior to treatment is given in Table No. IX. Cavitation was present in over 40% of patients and in nearly a quarter of the patients the disease had infiltrated over two-thirds of the lung fields. Positive sputum was found in over 60% of the patients (Table No. VIII) of which over 80% converted to negative with the first two

months of anti-tuberculosis therapy.

e) *Treatment*

Virtually all the patients were treated with I.N.A.H. and P A.S. (Table No. X). 90% of the patients were given streptomycin in addition. Drug reactions were noted in 8% of patients receiving streptomycin: the incidence of reaction increasing with the time of treatment with this drug. 21 out of the 846 patients were treated with secondary drugs, following the failure to control the infection with the primary drugs. Only 8 of the 846 patients were treated surgically.

The length of hospital treatment given to these patients averaged 4.7 months (See Graph No.1) and 45% of the sputum positive patients were given over six-months in-patient treatment. The total length of anti-tuberculosis therapy is shown in Graph No.2. 50% of the patients received over two years treatment, and 40% of the sputum positive patients were treated for over three years. The ultimate state of the patients in relation to the length of hospital treatment is shown in Graph No.3. Over 70% of the patients who received over six months hospital treatment are still alive, with the disease quiescent in about 30% to 40% of them. The period of follow-up is detailed in Table No. XI. Over half the 846 patients were followed up for over four years and 12% (107 patients) for over ten years.

In 42 patients there was a later relapse of the disease after chemotherapy had been discontinued on our advice based usually on radiological evidence alone. Half of these patients had discontinued treatments for over three years when their relapse was diagnosed (See Table XII).

## DISCUSSION

The Orang Asli are mostly an uneducated people living in inaccessible places, a backward hill tribe who, until recently, had little contact with the outside world. Being geographically isolated, they are generally found to have little immunity to diseases such as measles and upper respiratory infections, which are common outside the jungle. The population density is low with 18,000 people in 5,000 square miles of virgin jungle on the high ground in the centre of Malaysia: an average of less than four people per square mile. The incidence of tuberculosis in these people is high, higher than in the rest of the country. It is often asked how and when did tuberculosis reach the Orang Asli. Some come out of the deep jungle at least once a year to sell jungle produce such as rattan, jelutong and sometimes tin ore to buy salt and cloth for themselves. Others come out periodically to work on plantations for several weeks. Whilst out of the jungle they usually stay in quarters at the back of over-crowded Chinese shop-houses, and it is here that they may have become infected originally with tuberculosis. Where they live normally, in their jungle longhouses, the thinly clad Orang Asli spend the cold nights sleeping in close proximity, round a wood fire, coughing in the smoky atmosphere. They share eating and drinking utensils. It is not difficult to understand how the disease spreads in these communities. The Orang Asli living on the jungle fringe and in lowland areas have a lower incidence of tuberculosis, although they have much greater contact with other races.

There is an extensive medical service, 90% of the staff are Orang Asli and the medical posts they man cover all jungle areas, are in radio communication with the Orang Asli Hospital at Gombak and can call upon helicopter support. Because of this medical service it has been possible to control and treat tuberculosis in these people, and moreover it has also been possible to educate the majority of the tuberculous patients to continue to take their drugs for sufficiently long to inactivate their disease.

Although the ultimate mortality rate of patients in this series is high, 33% of the 541 sputum positive patients having been known to have died of tuberculosis, and a further 4% of non-tuberculous disease (Table No. XI), these figures reflect the number of years that many of them were followed up. The mortality at the end of one year from the time of diagnosis is 14.5%, calculated by including the sputum positive patients alive at one year (430) plus those who died in under one year (73). This is higher than the 8% of found by Turner (1962) in Kenya, and the 13% mortality in the British Medical Research Council Survey (1970), also in Kenya. The present series differs from others in that all the latter are selective; they start with patients who have come for treatment. This survey includes every patient diagnosed as having tuberculosis in a whole group (the Orang Asli), including those refusing treatment.

The prevalence rate of new Orang Asli cases arising from mass X-ray is 0.5% and the incidence of new cases is 0.14%; both have remained at the same level since 1966. The prevalence rate in the rest of West Malaysia is 0.57% in adults over 15 years of age,

TABLE NO. I. TOTAL NUMBER OF ORANG ASLI GIVEN CHEST X–RAYS

| YEAR | Total Orang Asli population aged 9 and above | Number X–rayed with M.M.R. | Number X–rayed routinely on admission to hospital | Total X–rayed | Percentage of population aged 9 and over X–rayed |
|---|---|---|---|---|---|
| 1961/63 | 30,500 | 13,165 | 2,260 | 15,425 | 50% |
| 1964 | 31,800 | 7,714 | 2,095 | 9,809 | 31% |
| 1965 | 32,500 | 14,360 | 2,140 | 16,500 | 51% |
| 1966 | 33,200 | 7,210 | 2,595 | 9,805 | 30% |
| 1967 | 33,900 | 4,469 | 2,720 | 7,189 | 21% |
| 1968 | 34,600 | 4,436 | 2,380 | 6,816 | 20% |
| 1969 | 35,300 | 4,132 | 2,385 | 6,517 | 18% |
| 1970 | 36,000 | 6,746 | 2,420 | 9,166 | 25% |
| 1971 | 36,800 | 9,516 | 2,630 | 12,146 | 33% |
| TOTAL | | 71,748 | 21,625 | 93,373 | |


*IDENTIFICATION OF T.B. PATIENT.*

TABLE NO. II. MASS MINIATURE X–RAY IN ORANG ASLI (1961–1971)

| YEAR | Total X rayed with M.M.R. | No. of patients with X–rays suspicious of T.B. | No. of patients further investigated. | No. of patients who died prior to investigation. | No. of patients not yet further investigated. | NEW CASES OF TB. | | | | Amended figure for prevalence | Known old cases of T.B. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sputum Positive | Sputum Negative | Total | Prevalence | | |
| 1961–63 | 13,165 | 739 | 657(89%) | 45 | 37 | 115 | 129 | 244 | 1.9% | 2.0% | 75 |
| 1964 | 7,714 | 412 | 382(93%) | 16 | 14 | 38 | 29 | 67 | 0.9% | 1.0% | 195 |
| 1965 | 14,360 | 503 | 453(90%) | 19 | 31 | 33 | 27 | 60 | 0.4% | 0.6% | 226 |
| 1966 | 7,210 | 292 | 254(87%) | 9 | 29 | 12 | 12 | 24 | 0.3% | 0.5% | 158 |
| 1967 | 4,469 | 136 | 123(90%) | 4 | 9 | 5 | 5 | 10 | 0.2% | 0.3% | 80 |
| 1968 | 4,436 | 140 | 127(90%) | 1 | 12 | 9 | 6 | 15 | 0.3% | 0.4% | 79 |
| 1969 | 4,132 | 179 | 160)89%) | 2 | 17 | 11 | 12 | 23 | 0.5% | 0,7% | 102 |
| 1970 | 6 746 | 247 | 217(88%) | 1 | 29 | 17 | 7 | 24 | 0.3% | 0.5% | 123 |
| 1971 | 9,516 | 263 | 165(62%) | 1 | 97 | 9 | 7 | 16 | 0.2% | 0.5% | 121 |
| TOTAL | 71,748 | 2,911 | 2,538(87%) | 98 | 275 | 249 | 234 | 483 | | | 1,159 |

TABLE NO. III SOURCE OF PRESENTING SYMPTON OF NEW PULMONARY PATIENTS 1962–1971

| Year | Mass X-Ray | Routing X-Ray | Unrelated Medical Condition | Cough | Maemoptysis | Loss of Weight | Other Symptons | Not Recorded | Total Patients |
|---|---|---|---|---|---|---|---|---|---|
| 1962 | 122 | 4 | 1 | 29 | 10 | 1 | 1 | 7 | 175 |
| 1963 | 36 | 1 | 2 | 17 | 13 | 0 | 0 | 10 | 79 |
| 1964 | 47 | 8 | 3 | 23 | 9 | 3 | 4 | 2 | 99 |
| 1965 | 50 | 5 | 4 | 5 | 6 | 0 | 10 | 4 | 84 |
| 1966 | 36 | 10 | 1 | 8 | 8 | 0 | 4 | 1 | 68 |
| 1967 | 14 | 4 | 6 | 11 | 7 | 2 | 3 | 2 | 49 |
| 1968 | 13 | 5 | 4 | 10 | 11 | 0 | 1 | 3 | 47 |
| 1969 | 24 | 3 | 3 | 10 | 9 | 2 | 7 | 0 | 58 |
| 1970 | 26 | 2 | 4 | 6 | 8 | 1 | 4 | 0 | 51 |
| 1971 | 35 | 8 | 2 | 8 | 16 | 2 | 4 | 0 | 75 |
| TOTAL | 403 | 50 | 30 | 127 | 97 | 11 | 38 | 29 | 785 |
| PER-- CENTAGE | 52% | 6% | 4% | 16% | 12% | 1% | 5% | 4% | |

TABLE NO. IV NEW TUBERCULOSIS PATIENTS 1951–1971

| YEAR | Total Orang Asli Population | Total number of new Tuberculosis patients | Incidence | Patients with pulmonary tuberculosis | Patients with only non pulmonary tuberculosis | Patients with pulmonary and extra pulmonary tuberculosis |
|---|---|---|---|---|---|---|
| 1951 | 32,500 | 5 | 0.002% | 5 | 0 | |
| 1952 | 33,500 | 5 | 0.002% | 4 | 1 | |
| 1953 | 34,500 | 11 | 0.003% | 9 | 2 | |
| 1954 | 35,500 | 6 | 0.002% | 3 | 3 | |
| 1955 | 36,500 | 10 | 0.003% | 9 | 1 | 1 |
| 1956 | 37,500 | 27 | 0.007% | 24 | 3 | |
| 1957 | 38,600 | 41 | 0.011% | 37 | 4 | |
| 1958 | 39,700 | 44 | 0.011% | 44 | 0 | 1 |
| 1959 | 40,800 | 41 | 0.010% | 38 | 3 | 1 |
| 1960 | 41,900 | 51 | 0.012% | 51 | 0 | 4 |
| 1961 | 43,000 | 138 | 0.032% | 135 | 3 | 7 |
| 1962 | 44,100 | 178 | 0.040% | 175 | 3 | 5 |
| 1963 | 45,300 | 86 | 0.019% | 79 | 7 | 1 |
| 1964 | 46,500 | 108 | 0.023% | 99 | 9 | 3 |
| 1965 | 47,700 | 90 | 0.019% | 84 | 6 | 9 |
| 1966 | 48,900 | 79 | 0.016% | 68 | 11 | 2 |
| 1967 | 50,200 | 51 | 0.010% | 49 | 2 | 2 |
| 1968 | 51,500 | 59 | 0.011% | 47 | 12 | 2 |
| 1969 | 52,800 | 64 | 0.012% | 58 | 6 | |
| 1970 | 54,100 | 53 | 0.010% | 51 | 2 | |
| 1971 | 55,400 | 78 | 0.014% | 75 | 3 | 2 |
| TOTAL | | 1,225 | | ( 1,144 ) ( 1,225 ) | 81 ) | 40 |

Based on 1961 census of 43,000 and 1969 census of 53,000 giving growth rate of 2,6% per annum.

TABLE NO. V. INCIDENCE OF TUBERCULOSIS CASES IN DIFFERENT ETHNIC GROUPS AND JUNGLE LOCALITIES

| Ethnic Group | Population | Number of T.B. Patients 1951–1971 | Incidence * | Deep Jungle Patients | Jungle Fringe Patients | Percentage in Deep |
|---|---|---|---|---|---|---|
| Temiar | 9.929 | 445 | 4.5 | 351 | 94 | 79% |
| Semai | 15,506 | 479 | 3.1 | 173 | 306 | 36% |
| Negrito | 1,215 | 27 | 2.2 | 9 | 18 | 33% |
| Mahmeri | 1,198 | 22 | 1.8 | 0 | 22 | Nil |
| Temuan | 7,240 | 123 | 1.7 | 0 | 123 | Nil |
| Semelai | 2,391 | 28 | 1.2 | 0 | 28 | Nil |
| Jahut | 2,013 | 13 | 0.7 | 0 | 13 | Nil |
| Jakun | 9,045 | 48 | 0.5 | 0 | 48 | Nil |
| Others | 4,416 | 17 | 0.4 | 0 | 17 | Nil |
| Not recorded | | 23 | | 10 | 13 | |
| TOTAL | 52,943 | 1,225 | | 543 | 682 | 44% |

* Incidence. In this column the total number of T.B. patients diagnosed from 1951–1971 is expressed as a percentage of the population in 1949 census.

TABLE NO. VI. INCIDENCE OF TUBERCULOSIS IN RELATION TO AGE AND SEX

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Tuberculosis patients 1951–1971 | Age | 0–5 | 6–10 | 11–15 | 16–20 | 21–40 | 41+ | Total |
| | Male | 21 | 22 | 24 | 84 | 439 | 225 | 815 (67%) |
| | Female | 7 | 13 | 9 | 38 | 224 | 119 | 410 (33%) |
| | Total | 28 | 35 | 33 | 122 | 663 | 344 | 1,225 |
| | Percentage | 2% | 3% | 3% | 10% | 46% | 28% | |
| Total admissions to Orang Asli Hospital in one year (1970) | Age | 0–5 | 6–10 | 11–15 | 16–20 | 21–40 | 41+ | Total |
| | Male | 434 | 155 | 66 | 149 | 501 | 253 | 1,558 (50%) |
| | Female | 454 | 147 | 98 | 167 | 521 | 152 | 1,539 (50%) |
| | Total | 888 | 302 | 164 | 316 | 1,022 | 405 | 3,097 |
| | Percentage | 29% | 10% | 5% | 10% | 33% | 13% | |
| Whole Orang Asli Population (1969 Census) | Age | 0–11 | | 12–20 | | 21+ | | Total |
| | Male | 10,891 | | 4,150 | | 12,442 | | 27,483 (52%) |
| | Female | 10,511 | | 3,991 | | 10,958 | | 25,460 (48%) |
| | Total | 21,402 | | 8,141 | | 23,400 | | 52,943 |
| | Percentage | 40% | | 15% | | 45% | | |

TABLE NO. VII. RELATIVE INCIDENCE OF TUBERCULOSIS, LENGTH OF HSOPITAL STAY AND ABSCONDING FROM HOSPITAL IN DIFFERENT STATES AND LOCATIONS.

| State | Total Orang Asli Population | T.B. Patients 1951–1971 | Incidence of T.B. * | Deep Jungle Patients | Jungle Fringe Patients | Percentage in deep Jungle | Average stay in hospital in months | Absconded from hospital |
|---|---|---|---|---|---|---|---|---|
| Kelantan | 4,758 | 221 | 4.6% | 220 | 1 | 100% | 5.5 | 4 (2.1%) |
| Pahang | 19,501 | 279 | 1.4% | 163 | 116 | 58% | 4.8 | 19 (8.4%) |
| Perak | 16,660 | 554 | 3.2% | 160 | 384 | 29% | 4.5 | 15 (3.3%) |
| Selangor | 4,557 | 92 | 2.0% | 0 | 92 | 0 | 3.8 | 11 (14%) |
| Negri Sembilan | 3 119 | 39 | 1.2% | 0 | 39 | 0 | 3.6 | 4 (12%) |
| Johore | 3,664 | 34 | 0.9% | 0 | 34 | 0 | 3.2 | 5 (19%) |
| Malacca | 391 | 7 | 1.8% | 0 | 7 | 0 | 5.5 | 0 |
| Kedah | 78 | 9 | 9.1% | 0 | 9 | 0 | 7.2 | 0 |
| Trengganu | 195 | 0 | | | | | | |
| TOTAL | 52,943 | 1,225 | | | | | | |

* Incidence. In this column the total number of patients 1951–1971 is expressed as percentage of the population in the 1969 census.

TABLE NO. VIII. SPUTUM

Positive sputum found in 541 patients.
No positive sputum or not recorded in remaining 305 patients.
Conversion of positive sputum to negative under treatment:–

| | | |
|---|---|---|
| Converted within 2 months of treatment | – | 396 patients (81%) |
| Converted between 2 months and 6 months | – | 27 patients ( 5%) |
| Converted after over 6 months treatment | – | 15 patients ( 3%) |
| Remained sputum positive | – | 55 patients (11%) |

(Details of sputum conversion not recorded in the remaining 48 patients).

TABLE NO. IX.

RADIOLOGICAL APPEARANCE ON PATIENTS WITH PULMONARY TUBERCULOSIS

| Radiological appearance | Number of patients | Patients with cavitation | Patients with positive sputum | Patients with negative sputum |
|---|---|---|---|---|
| Normal | 3 | 0 | 3 | 0 |
| Stage One | 388 | 103 | 168 | 220 |
| Stage Two | 272 | 147 | 213 | 59 |
| Stage Three | 183 | 120 | 157 | 26 |
| TOTAL | 846 | 370 | 541 | 305 |

Of the 370 patients with cavitation, 324 were confirmed sputum positive.

Stage One = Total area of disease NOT exceeding one third of lung aggregate
Stage Two = Total area of disease NOT exceeding two thirds of lung aggreggate
Stage Three = Total area of disease EXCEEDING above.

TABLE NO. X. REACTIONS TO DRUGS

| Drug | Cases with reactions | Cases under treatment | Incidence of reactions |
|---|---|---|---|
| I N.A.H. | 1 | 812 | 0.1% |
| Streptomycin | 62 | 746 | 8.3% |
| P.A.S. | 8 | 807 | 1.0% |
| Thiacetazone | 2 | 27 | 7.5% |
| Secondary drugs | 1 | 52 | |
| The single reaction to INAH occurred after five years treatment | | | |
| Reactions to PAS occurred at a constant percentage throughout treatment | | | |

| Drug | Time of reaction | Cases with reaction | Cases under treatment | Incidence |
|---|---|---|---|---|
| Streptomycin | < 1/12 | 21 | 733 | 2.9% |
| " | < 3/12 | 16 | 655 | 2.4% |
| " | < 6/12 | 15 | 454 | 3.3% |
| " | 6/12+ | 7 | 178 | 4.0% |
| " | 12/12+ | 1 | 25 | 4.0% |
| " | 18/12–24/12 | 1 | 5 | 20.0% |
| " | Time not recorded | 1 | | |

TABLE NO. XI. FOLLOW UP OF PULMONARY TUBERCULOSIS PATIENTS

| Duration of follow-up | Total number of patients followed-up | Number of sputum positive patients followed-up | ULTIMATE KNOWN STATE OF SPUTUM POSITIVE PATIENTS | | | |
|---|---|---|---|---|---|---|
| | | | Alive T.B. quiescent | Patient still prescribed drugs | Dead due to T.B. | Dead from other disease |
| Under 1 year | 846 | 541 | 211 | 126 | 182 | 22 |
| Over 1 year | 678 | 430 | 211 | 88 | 109 | 22 |
| Over 2 years | 628 | 392 | 209 | 80 | 84 | 19 |
| Over 3 years | 563 | 342 | 205 | 59 | 60 | 18 |
| Over 4 years | 490 | 286 | 180 | 50 | 41 | 15 |
| Over 5 years | 409 | 239 | 149 | 45 | 31 | 14 |
| Over 6 years | 314 | 192 | 123 | 34 | 23 | 12 |
| Over 7 years | 260 | 149 | 97 | 23 | 17 | 12 |
| Over 8 years | 203 | 116 | 79 | 14 | 11 | 12 |
| Over 9 years | 158 | 90 | 67 | 7 | 8 | 8 |
| Over 10 years | 107 | 65 | 52 | 3 | 5 | 5 |
| Over 11 years | 53 | 34 | 27 | 2 | 3 | 2 |
| Over 12 years | 36 | 25 | 21 | 1 | 2 | 1 |
| Over 13 years | 24 | 16 | 14 | 0 | 2 | 0 |
| Over 14 years | 15 | 8 | 7 | 0 | 1 | 0 |
| Over 15 years | 8 | 5 | 4 | 0 | 1 | 0 |
| Over 16 years | 6 | 3 | 3 | 0 | 0 | 0 |
| Over 17 years | 3 | 2 | 2 | 0 | 0 | 0 |

TABLE NO. XII. RELAPSE PATIENTS

A) Time from discontinuing chemotherapy by the doctor until diagnosis of the relapse.

| Time | <1 year | 1 year + | 2 years + | 3 years + | 4 years + | 5 years + | 6 years + | 7 years + | Total |
|---|---|---|---|---|---|---|---|---|---|
| Number of relapses | 2 | 13 | 6 | 6 | 5 | 6 | 2 | 2 | 42 |

B) Number of relapse cases in relation to the length of initial treatment

| Duration of initial treatment | <1 year | 1 year + | 1½ years + | 2 years + | 2½ years + | 3 years + | 4 years + | 5 years + | Total |
|---|---|---|---|---|---|---|---|---|---|
| Number of patients relapsing | 0 | 1 | 9 | 10 | 8 | 9 | 3 | 3 | 42 |
| Total treated | 213 | 73 | 70 | 142 | 81 | 122 | 78 | 62 | 841 |
| Percentage relapsing | 0 | 1% | 13% | 7% | 10% | 7% | 4% | 5% | 5% |

C) Treatment of relapse cases.

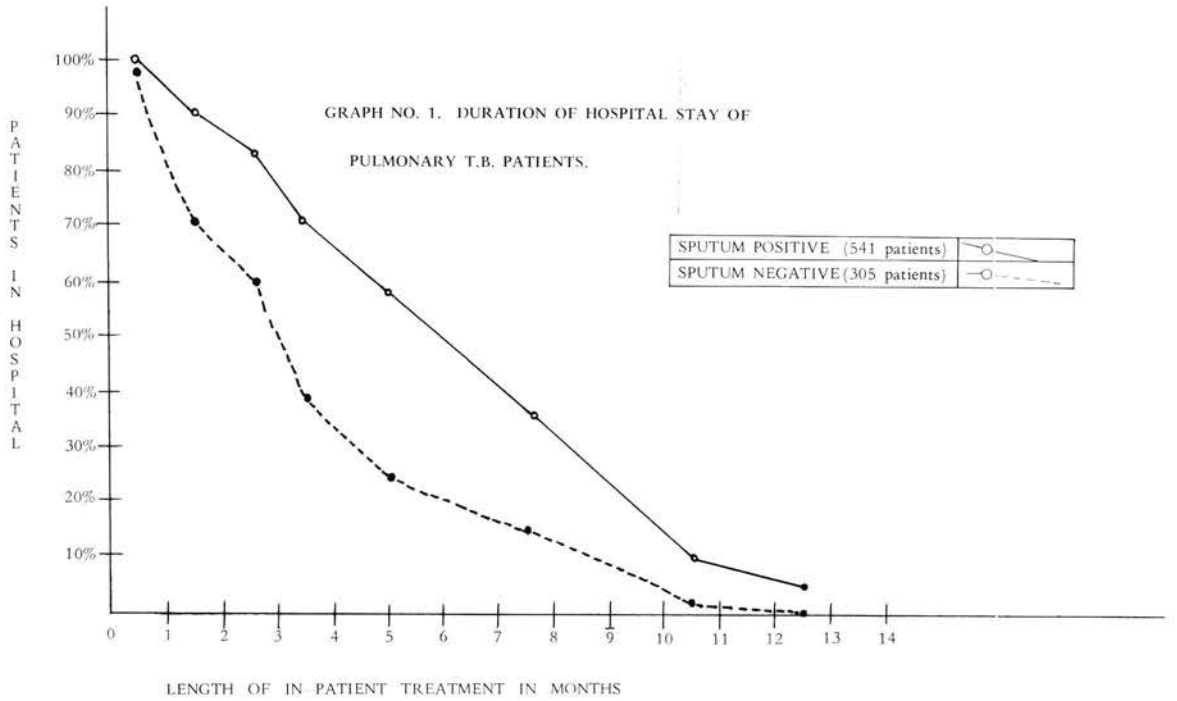
29 of the relapse patients were further treated.
They were given INAH ( 29 patients), PAS (28 patients), Streptomycin (18 patients)
Thiacetazone (6 patients) Ethambutal (3 patients) Pyrazinamide (1 patient) and Rifadin (1 patient)

D) Ultimate state of Relapse patients.

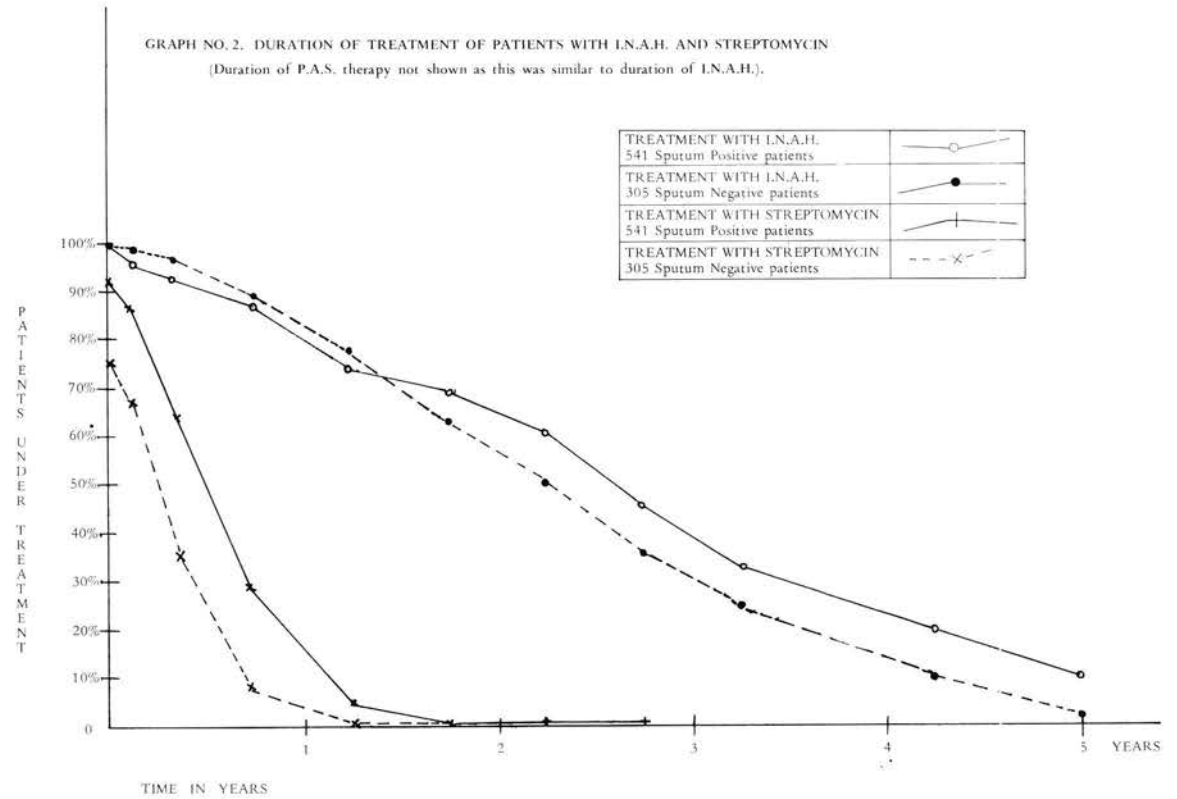
Alive – TB quiescent 10
TB active 26

Died from TB 5.
Died from known other disease 1.

GRAPH NO. 1. DURATION OF HOSPITAL STAY OF PULMONARY T.B. PATIENTS.

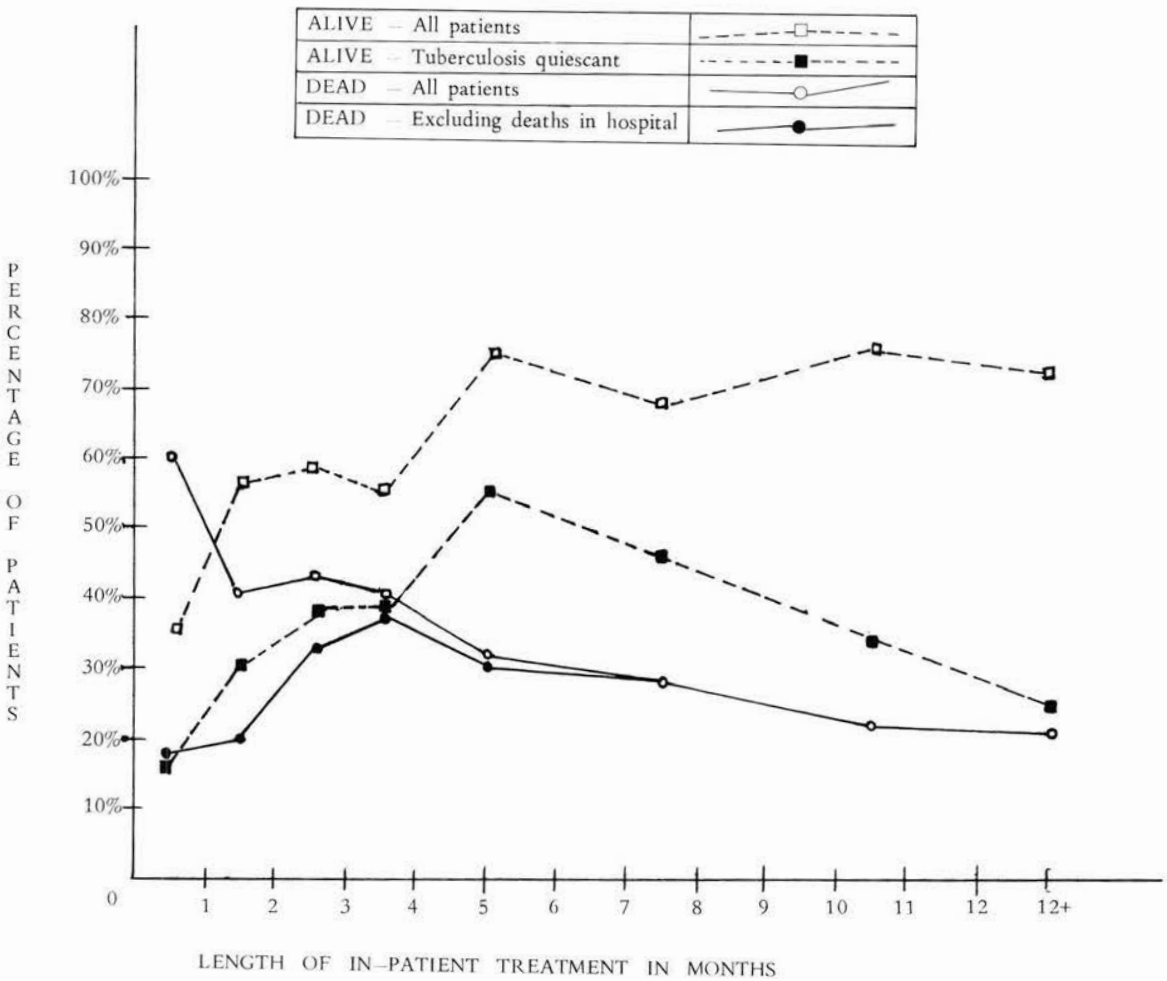



GRAPH NO. 2. DURATION OF TREATMENT OF PATIENTS WITH I.N.A.H. AND STREPTOMYCIN
(Duration of P.A.S. therapy not shown as this was similar to duration of I.N.A.H.).



GRAPH NO. 3. ULTIMATE STATE OF TUBERCULOSIS PATIENTS IN RELATION TO THE LENGTH OF PRIOR IN–PATIENT HOSPITAL TREATMENT.

(541 Sputum Positive patients)



giving an estimated prevalence rate of 0.28% for the whole population (W.H.O. 1970). The annual incidence is calculated as 0.56%, using the W.H.O. ratio of one fifth of the prevalence rate. The tuberculosis morbidity of the Orang Asli is therefore twice the national average.

The higher incidence of tuberculosis in males is not confined to the Orang Asli, with the 2.0 males to one female predominance; there is an even higher ratio of 2.8 males to one female in the whole population of West Malaysia, with the same increasing prevalence in both sexes with the higher age group (W.H.O. 1970). In Sabah there is a smaller male predominance of 1.6 males to one female (Roy 1968). Turner (1962) in Kenya found a slightly higher incidence of tuberculosis in males than females over the age of 16. Among the Orang Asli, even in the under five and five to ten age groups, the incidence of tuberculosis is twice as high in males. Here a possible explanation is that boys are considered more valuable than girls, so that more effort is made to report their illness.

The most important finding is that in the Orang Asli tuberculosis is very much more common with advancing age. In the majority of these elderly patients admitted with advanced pulmonary tuberculosis, we have miniature X-rays taken in previous years, with no radiological abnormality, thus showing the infection to be of recent origin in most of them. Following this finding, the B.C.G. innoculation programme has been extended to include all age groups, not just the under 25.

No mention has been made of cost. In assessing this, the problem of tuberculosis in West Malaysia must be considered as a whole. Malaysian $211 million (£31 million in 1971) is spent annually on the medical services for a population of nine million people. Of this sum, about Malaysian $2½ million (£0.75 million in 1971) is spent directly on the national tuberculosis programme. In contrast, the Orang Asli number 55,000 with twice the incidence of tuberculosis and Malaysia $1.4 million (£0.2 million in 1971) is spent annually on medical services to them, of which probably 10% is spent on tuberculosis.

The overall cost of keeping patients at the Orang Asli Hospital is Malaysia $5.5 (£0.78 - 1971) per day compared with Malaysian $19.6 (£2.0) per day in other Malaysian Government hospitals. The helicopter support is not paid for out of the medical budget; it is considered important peacetime training for the R.M.A.F. pilots. In former years, support was given by the R.A.F. and the R.M.A.F. as part of their 'hearts and minds' campaign to make and keep friends with these people. Concurrently with the tuberculosis control programme, there is a large malaria control project and other preventative health schemes among the Orang Asli, all using the same facilities.

A vigorous attempt is being made to control tuberculosis in the Orang Asli. In a few years time it will be easier to judge whether these efforts have been successful and wise, or whether they have been extravagant and misdirected.

## ACKNOWLEDGEMENTS

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# Medical services for the Orang asli (Aborigines) of West Malaysia

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## INTRODUCTION

The Medical Service for the Orang Asli (Aborigines) is part of the Department of Orang Asli Affairs, which is presently in the Ministry of Home Affairs. It is separate from the Ministry of Health although its medical officers and guidance for its medical policies come from that Ministry. The aim of the Medical Service is to provide total health care for the Orang Asli and this is carried out in the villages, jungle posts and in the Gombak Orang Asli medical centre. The medical staff divide their time between the jungle posts and the hospital wards, work in both being complementary to each other.

An early problem in the medical programme was the influence of traditional indigenous medicine. It had advantages for the sick Orang Asli, the use of food taboos, community dancing and spiritual trance requiring little effort on the part of the patient. However this influence regressed as the people became exposed to the outside world. Western medicine is more readily acceptable nowadays. Staff training was also a problem and this was solved by carrying out the training in Gombak Hospital. The third major problem in setting up the Medical Service concerned communication between the medical posts in isolated jungle villages and Gombak Hospital. A wireless network was set up to link them, and a helicopter service allowed the medical officers to visit the posts regularly each month.

## HISTORY

The medical section of the Department of Orang Asli Affairs was started in late 1954 by the Department itself. The Ministry of Health had been asked to provide a medical service for the Orang Asli especially those in deep jungle areas who at that time were quite outside the medical services provided for the rest of the population. However, the Ministry of Health was unable to do this as it was already overextended in dealing with problems created by the First Malayan Emergency (1948 - 1960). The Department of Orang Asli Affairs was convinced that the setting up of a medical service for Orang Asli even in skeleton form, was quite essential if the Government was to make any progress in improving the life of the Orang Asli population. Furthermore, the Government had to show them that it cared for them in order to enlist their help for the Security Forces in the jungle. In late 1954 therefore the Department requested the Ministry of Health to recruit two medical officers to be attached to the Department for full-time work among the Orang Asli community. These two doctors, Dr. Malcom Bolton and Dr. Lichtenstein immediately started the recruitment of 14 Field Assistants, who were ex-medical orderlies or other personnel in the Royal Army Medical Corps of the British Army. Initially, one Field Assistant was posted to each of the 13 jungle posts which existed at the time and this provided the basis of the Medical Section.

The two Medical Officers travelled all over Malaya by helicopter, land vehicle, boat and/or foot, visiting the posts on a regular basis to provide medical treatment for the Orang Asli living near them and to supervise the field assistants. Visits were also made to other groups not living near the posts as often as possible. Initially, a 12-bed hospital was set up in Kuala Lipis, Pahang. The Medical Staff were able to bring Orang Asli who needed treatment there and send them back when they were well. The need for a bigger hospital was soon felt when more Orang Asli accepted treatment, and in 1957, the present hospital was set up in Gombak, 12 miles north-east of Kuala Lumpur. The hospital in Kuala Lipis was downgraded and the Department concentrated its effort in the development of the medical centre in Gombak. The number of jungle posts was increased to its present strength of 135 with a proportionate increase in staff.

The first success of the Medical Section was the complete elimination of Yaws by mid-1956. In 1954, this disease was widespread amongst the Orang Asli Community. Its treatment was simple and effective. The elimination of this disease in their community played a great part in convincing the Orang Asli of the benefits of modern medicine.

## STRUCTURE OF THE MEDICAL SERVICE

### Jungle Posts

There are 135 jungle posts. These are made up of a clinic, medical posts and emergency evacuation posts.

There are 70 jungle medical posts, each manned by an Orang Asli medical orderly or midwife, assisted by a porter. These posts are distributed throughout the inhabited jungle area of West Malaysia, but concentrated mainly in the central mountain chain. Each post has two beds for sick patients, a dispensary, a wireless transmitter-receiver and a landing zone. The medical orderly has a programme whereby he spends some time in the post, maintaining it and treating patients who go there, and some time (about 10 days a month) visiting the surrounding villages in an area of about 30 square miles. He treats simple illnesses and consults the doctors in Gombok Hospital via wireless or during the routine helicopter visits if a patient is more seriously ill. When he thinks a patient needs hospitalisation, he will consult Gombak Hospital and a road vehicle, boat or helicopter will be sent in to bring the patient out. Whenever a patient cannot be carried to a landing pad, the medical orderly will make a new one near the patient and direct the helicopter in by wireless. The orderly's work includes following up tuberculosis and leprosy patients who have been discharged back to their villages. His rations and medical supplies are sent in similarly - by road (usually only a jeep track), river, or air (air drops are done monthly). In most of the posts, there are also antimalarial workers who carry out house spraying and issue weekly prophylactic drugs to the villagers. The one clinic in the jungle has a laboratory and a midwife clinic as additional features.

There are 64 emergency posts similarly distributed in the country. While the medical posts are situated in areas of relatively high population concentration, these are in areas of small groups of people. There is a small building with a small range of drugs, a helicopter landing zone and a wireless transmitter-receiver set (most of these posts are now equipped with these wireless sets). A local Orang Asli porter is in charge of the post and he maintains the landing zone, gives first aid which he has been trained to do, and reports on any seriously ill person to Gombak Hospital or to the medical orderly in his area. The medical orderly visits these posts monthly. The post is also visited by a medical officer on his routine helicopter run.

### Gombak Hospital

This is a base hospital at Gombak, 12 miles from Kuala Lumpur along the Selangor - Pahang trunk road. It is sited beside a river and is surrounded by primary jungle. It has a capacity for 450 patients but presently has an average daily in-patient population of 350. There are 13 wards:--

1 intensive nursing/acute care ward;
4 wards for tuberculosis and chest disease;
2 antenatal wards;
1 postnatal ward;
1 paediatric ward;
3 general medical and surgical wards.
and 1 ward for staff.

One building houses the labour room, minor operating theatre, offices, library and classrooms (and the paediatric ward). Another houses the dental clinic-cum-surgery, central sterilising and supply unit and laboratory. The hospital also has its own dispensary, store, medical record section, X-ray and tuberculosis department, and outpatient department.

Previously the trained staff in the hospital were solely expatriates, but now they are mostly Malaysians. The hospital is now run by a local Malaysian doctor. The trained staff act as supervisors to the medical orderlies, eighty percent of whom are Orang Asli.

The hospital is the nerve centre of the medical service and all medical programmes are directed from the Hospital.

### Communications

A wireless network links the medical and emergency posts to Gombak Hospital. It also links Gombak Hospital, the ambulances, helicopters and helicopter squadron headquarters. Transmission takes place from 7 o'clock in the morning to 7 o'clock in the night. A general news broadcast is sent out at 8 o'clock and posts are told to stand by if there are messages for them. Each post them reports in alphabetical order and switches off after the report. Messages are then transmitted to specific posts which have been on standby. These messages include notice of visits and administrative orders.

All sets then close down while the main station at Gombak Hospital and substations at the main towns remain on standby, ready to receive news. The post will call the main station in Gombak, if medical help or otherwise is needed, or the substation if the news is of regional interest or if the signal is two weak to be received by Gombak.

Many posts are accessible by road or river, but many are accessible only by jungle tracks and helicopters. The transport section sees to it that movement of patients, staff and material between Gombak Hospital and the posts is as smooth as possible.

## STAFF

The medical section has one senior medical officer, four other medical officers, two dentists, three non-medical administrative officers, five nurses (with 6 more unfilled posts), one trained assistant nurse, and 278 medical orderlies.

While the trained staff were formerly completely expatriates, volunteers from the British V.S.O., New Zealand V.S.A., Canadian-American Care-Medico, the American Peace Corps and U.S. Army, and the Canadian C.U.S.O., the majority are now Malaysians. There are two Canadian and two British nurses in Gombak presently. The trained staff supervise the medical orderlies and help in their guidance and training. To succeed in this, it is very important that the trained staff have a genuine interest in the Orang Asli and try to understand both patients and staff. The Orang Asli are very sensitive to the moods and attitudes of the officers and if offended, tend to withdraw into themselves.

The medical orderlies are mainly Orang Asli. The non-Orang Asli orderlies are based in Gombak doing administrative work and in district Orang Asli Department offices treating the Orang Asli in the jungle fringe. Some work in the hospital wards. The Orang Asli medical orderlies work in the hospital and the jungle posts. One has become the assistant administrative director of the medical section. The orderlies alternate between working in the hospital and in the jungle posts. In Gombak Hospital, they initially undergo a six-month training programme after which they have in-service training. When the orderlies go into the posts, they treat patients in the way they are trained to. One third of these orderlies, male and female are also trained in midwifery. In Gombak Hospital, the medical orderlies also work in the special units such as the X-ray and tuberculosis unit.

The Orang Asli were specially chosen for training and work in the medical service because of several reasons. Initial experience with the training of Orang Asli for work in the medical service was encouraging as they showed an ability to acquire skills and responsibilities. They were also trusted by their own people. This makes it easy for them to influence their people to accept modern medicine. It is also easier for the Orang Asli patient to find that he is among his own people when he leaves his jungle home to enter Gombak Hospital. He knows that he can possibly find someone from his area who can converse in his tribal dialect. The Orang Asli orderly is also physically suitable for work in the jungle. He is used to living in the jungle with its "wild" environment, he can walk long distances in the jungle with a heavy pack on his back, and he can build rafts and ride the numerous rivers and streams. Furthermore, he can survive in the jungle when rations are delayed or destroyed in faulty airdrops. Bearing in mind that he is helping his own people, the Orang Asli orderly works extra hours and extra duties without complaint.

## MEDICAL PROBLEMS

Early in the Service, yaws, malaria, tuberculosis, leprosy, amoebic dysentery, worm infestation and malnutrition were the main problems. Presently yaws has been eliminated and tuberculosis, leprosy, amoebic dysentery and malnutrition have been controlled. Smoking is widespread and respiratory illnesses common. The disease pattern is becoming similar to that of the rural areas of the country.

The Orang Asli can presently be divided into three groups with regards to medical problems - the urban dwellers, those in the fringe jungle areas and those in the deep jungle. The urban dwellers are the few Orang Asli who work in the towns, many being staff of the Department of Orang Asli Affairs. Diseases due to poor hygiene and sanitation are not a problem with them. Malnutrition is also not a problem for these people eat relatively better than those in the jungle. Those living in the fringe jungle are the worst off. Water is contaminated and parasitic diseases common. Amoebic dysentary was once a great menace, but the digging of properly sited and built wells have controlled it. Malnutrition is a problem as the diet is poor. Fish and meat have to be bought. Money earned from tapping rubber is often spent on tobacco, sweets and store cakes. The deep jungle dwellers are more healthy. They grow and catch their own food. Water is clean and they have not been much exposed to diseases of the rural and urban areas. Amoebiasis is not a problem. Worm infestation is low. However, malaria is a big problem especially when new ladangs (agricultural clearings) are made.

## MEDICAL PROGRAMMES

### Treatment

Treatment starts in the medical or emergency posts. If the illness is severe, then the medical orderly requests for transport to take the sick patient and his relatives to Gombak Hospital. This may be by road, river or air (helicopter). Road vehicles may go into accessible villages and posts to send back patients, staff or material, and when they do so they take back people who are sick to Gombak.

In emergencies, posts which are not accessible by road are reached by helicopter in a medical evacuation ("medivac") service. In urgent cases, a helicopter leaves its base within one hour of notification (medivac alpha), flies into the jungle and returns to Gombak with the patient. If the case is very urgent, the helicopter lands and discharges the patient in the nearest general hospital or in the nearest post to be transferred by road to the general hospital if the hospital has no landing area. Unfortunately, some members of some general hospitals are ignorant of the urgency of such cases and patients have been lost because of this. This forces the medical section to try to land all medivac alpha patients in Gombak, no matter how far away the post is from Gombak.

Medivac "bravo" is requested for less urgent cases and the helicopter leaves within 24 hours. Medivac "charlie" obtains a helicopter within 3 days and medivac "delta" within 7 days. "Charlie" and "delta" are usually for patients who are not seriously ill but also cannot be otherwise transported to Gombak. (Figure 1)

The hospital runs an outpatient clinic where staff and non-Orang Asli from the area around the hospital are seen and treated. This allows the Orang Asli and non-Orang Asli to mix freely and also allows the people living around the use of the outpatient facilities.

### Field Visits

Teams regularly leave Gombak Hospital to visit the medical posts and their surrounding villages. Doctors and nurses in the service are expected to carry out field visits. Each is expected to spend seven to ten days a month in the field. At any time of the month, one doctor and one nurse are expected to be out in the field, either together or in separate teams. Two dental officers spend alternate weeks in the field treating the Orang Asli in the posts and schools set up by the Department of Orang Asli Affairs. One remains in Gombak Hospital to treat the inpatients and outpatients. Teams of medical orderlies also carry out field visits. The X-Ray and tuberculosis unit, the immunisation team and the dispensary have their own mobile teams.

### Health Programmes

These include tuberculosis control, malaria eradication, immunisation, family planning and social welfare. It is hoped that an applied nutrition project can be started soon.

### Health Education

There has not yet been an organised programme for health education although it is attempted in the hospital, medical posts and in the schools set up in the jungle. A programme is in preparation at the moment.

### Training

Training of medical orderlies is carried out in Gombak Hospital. After an initial six month course on first aid and medical treatment, the orderly starts to work in the wards where his training continues. At the end of one to one and a half years, he is ready to work alone in the medical post. While he is there, he can contact Gombak Hospital by wireless if he needs guidance.

Additional training courses are given for midwifery. The staff who work in special units are trained as they serve in them. Some have received training outside Gombak Hospital, in the Institute of Medical Research, Kuala Lumpur, the National Tuberculosis Centre, Kuala Lumpur, Malaria Eradication Programme Headquarters, Kuala Lumpur and the Public Health Training Centres in Rembau and Jitra.

A nursing school has been set up with the guidance of the Nursing Board of the Ministry of Health. The school aims to prepare the medical orderlies for the examination for trained assistant nurses by the Ministry of Health so that they would have a standard and a paper qualification equivalent to that of the assistant nurses in the hospital of the Ministry of Health. A two year in-service course is held for selected trainees for this purpose.

## FOREIGN AID

Foreign aid has played a big part in building and maintaining the medical service.

It has provided trained staff - doctors, dentists, nurses, midwives, an occupational therapist, laboratory technicians, a radio engineer, a radiographer and others. They have come from various volunteer organisations - the British V.S.O., New Zealand V.S.A., Canadian C.U.S.O., Japanese O.V.C., German Volunteer Service, the American Peace Corps, Canadian-American Care-medico and the U.S. Army.

Foreign aid has been helpful materially too. Foreign aid built buildings, brought vehicles (ambulances, land rovers, lorries, etc), radio transmitter-receivers, laboratory equipment, radiographic equipment, midwifery packs, and early in the service, medical supplies.

## MALAYSIANISATION AND PRESENT PROBLEMS

The Medical Service, once completely run by expatriates and foreign volunteers, has been taken over by Malaysians. Volunteers are still present and needed, especially for the work in the deep jungle. The first local Malaysian doctor joined the service four years ago, and since then, local doctors have been serving in the Department. Local Malaysian nurses have also served from about the same time.

The Ministry of Health has now become responsible for the supply of hospital equipment and medicine, although we still receive foreign material occasionally.

The process of Malaysianisation has brought its problems and these will have to be ironed out. The Service has to compete with other hsopitals for staff and material from the Ministry of Health. Some local officers are reluctant to work in the field which they do not have to when they are in Ministry of Health hospitals. There is also a strong tendency to treat and compare the Service with the Ministry of Health hospitals, forgetting the special circumstances that the Service was built for. These problems will gradually disappear as local officers understand, accept and dedicate themselves to the objectives and nature of the Medical Service.

The continuing existence of the Departmental Medical and Health Service for the Orang Asli outside the normal services provided by the Ministry of Health is justified by the geographical isolation of the majority of the people it deals with, the attendant problems of communication, and a difficult and rugged terrain. Although an increasing number of the more sophisticated Orang Asli are willing to be admitted to normal Ministry of Health Hospitals both at state and district levels, there are still a large number of deep jungle dwellers who feel quite out of place at such hospitals and regard the atmosphere of the Departmental Hospital as more sympathetic and understanding as regards their needs. The fact that most of the nursing staff are members of their own community strongly reinforces this attitute.

*Gombak Hospital.*

*A family in hospital.*

*A jungle medical post with its landing zone.*

*Orang Asli in their village.*

*A patient for Gombak Hospital.*


*Travelling dispensary attracts fringe jungle Orang Asli.*

## CONCLUSION

The Medical Service for the Orang Asli (Aborigines) of West Malaysia has been effective in providing them with medical care and in helping to bring about a change in their mental attitude and socio-economic status. Foreign nations have helped in setting it up and maintaining it. There has been an active Malaysianisation process and the service is now directed by local officers. Its unique circumstances justify its existence as a separate unit outside the normal services provided by the Ministry of Health, although there are problems created by this set-up.


## SUMMARY

The Medical Service for the Orang Asli (Aborigines) of West Malaysia was set up in 1954 as an effort to improve their well-being as well as an inducement to the Orang Asli to co-operate with the government security forces. It is now part of an overall project to help in the wellbeing and advancement of the aborigines.



## ACKNOWLEDGEMENT

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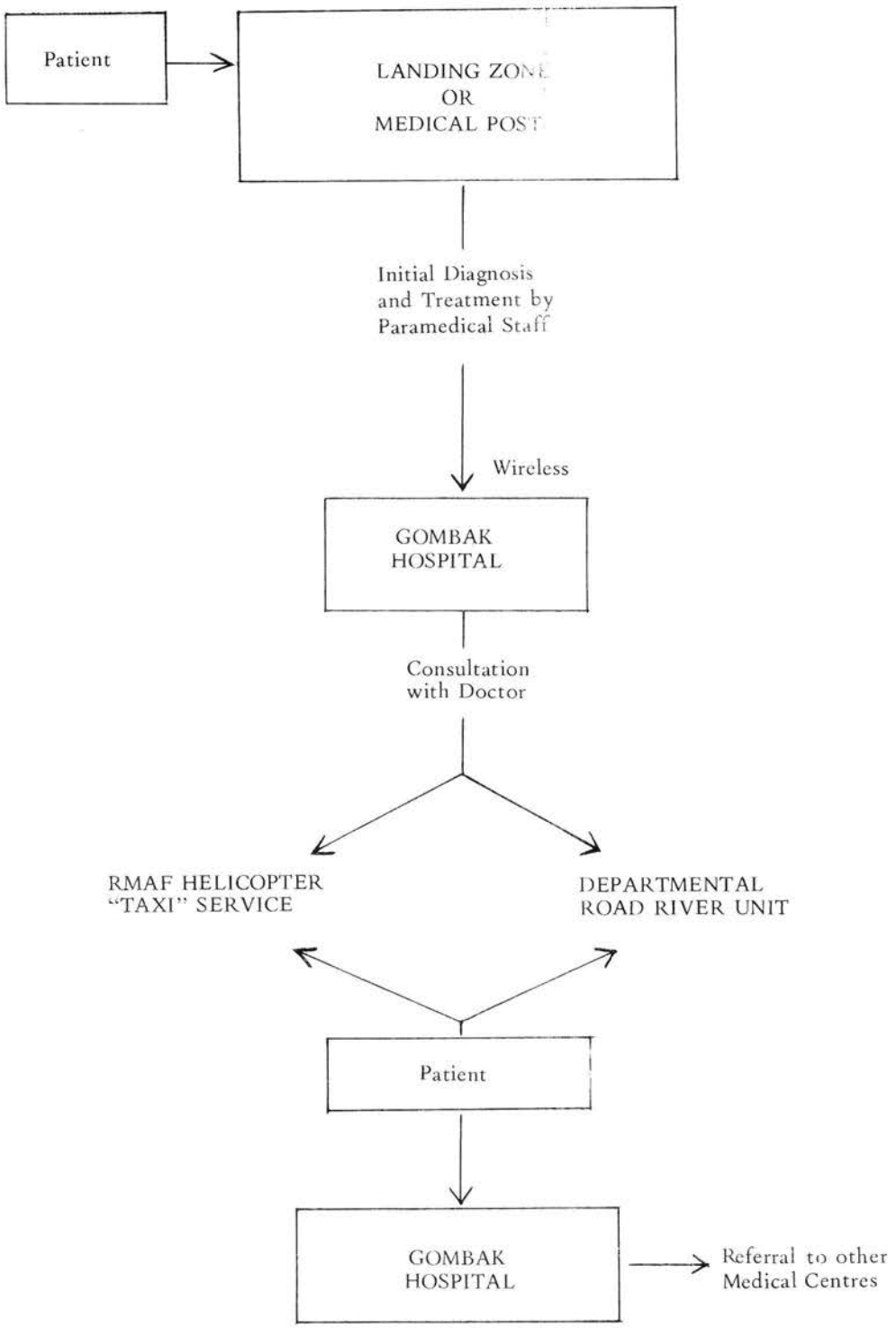


Figure 1: THE CALL FOR HELP

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# Recommended daily dietary intakes for peninsular Malaysia

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## INTRODUCTION

A dietary standard is a numerical expression, usually as a daily average, of quantities of certain nutrients believed to be needed by an individual assignable to one of the various categories into which a population may be divided for dietary purposes (Young, 1964). Other terms such as "recommended daily dietary allowances", "nutritional requirements", and "suggested daily dietary intakes" have been used to describe such a standard. In this paper, the term "recommended daily dietary intakes" will be used synonymously with "dietary standard".

Dietary standards are necessary yardsticks against which the diets of different segments of a community may be measured for study purposes. They can be used to advantage for planning agricultural food production. In times of social upheaval dietary standards are essential for the planning of food stockpiling and distribution when food rationing has to be instituted. Dietary standards are important to guide the formulation of diet scales for institution or for physicians to advise individual patients concerning dietary needs.

Dietary standards have evolved over a span of several decades. In 1950, when Burgess and Laidin A. Musa reported on the state of health, diet and the economic conditions of groups of people in the lower income levels in Malaya, the dietary standard used for their discussions on the adequacy of nutrient intakes was that recommended by the National Research Council, USA in 1948. In 1956, Millis used the recommendations of the Committee on Calorie Requirements Food and Agriculture Organisation of the United Nations (1950) to determine the energy requirements of the population in Singapore. Thomson in her study on child nutrition in Perak in 1959 used 'modified' (sic) recommended allowances from the Food and Nutrition Board of the National Research Council, USA (1954). In 1962, Recommended Daily Dietary Allowances - Malaya, based on the recommendations of the National Research Council, USA (1958) and the Food and Agriculture Organisation suggestions on Calcium requirements (1962) were worked out by the Institute for Medical Research in Kuala Lumpur. A further revision of these figures was made in 1964.

In 1969, a Technical Subgroup was formed consisting of representatives from the Public Health Institute, World Health Organisation, Institute of Medical Research and the writer from the Faculty of Medicine, University of Malaya, to advise on the dietary aspect of the then proposed applied nutrition pilot project. This Technical Subgroup worked out a new dietary standard for Malaysia based on various World Health Organisation recommendations published since 1964 (Chong, 1969).

New concepts and units have since been introduced and fresh recommendations have been promulgated by the World Health Organisation (WHO, 1970, 1973). In view of this development, a revision of the 1969 recommended dietary allowances is now necessary.

## METHOD

### Population

The table of recommended daily dietary intakes for residents of Peninsular Malaysia for 1973 (Table 1) itemizes eight distinct population groups viz: adult men, adult non-pregnant, non-lactating women, pregnant women, lactating women, infants, children, adolescent boys, and adolescent girls. These population groups are divided into suitable age subclassifications. For adults, men are assumed to have an average weight of 55 kilograms and women, (non-pregnant, non-lactating) 50 kilograms. This follows previous recommendations of the Institute for Medical Research (IMR, 1962) and the Technical Subgroup (1969).

### Engery

The dietary standard for energy intakes have been calculated according to suggestions contained in a joint FAO/WHO report on energy and protein requirements (WHO, 1973). In these calculations, four factors which influence the need for energy by a particular individual are taken into consideration. These factors are body-size (as measured by body-weight), age, sex and physical activity. The factor of climate (as measured by environmental temperature) which was formerly (FAO, 1957) included in the calculations has been dropped as it was felt that it was not possible to quantify the effects of the environment just by temperature alone. Further, if physical activity is restructed by environmental factors, the category of activity should be adjusted rather than involving another factor.

The category of "moderate" physical activity was chosen as a representative category for the population though it must be stressed that individuals may vary widely. This moderate activity category includes most men in light industry, male building workers, many farm workers, fishermen and soldiers not on active service. It also includes women in light industry, housewives without mechanical household appliances, department store sales girls and students of both sexes (WHO, 1973). Other categories are "light activity" which includes office workers, teachers and other sedentary workers; "very active" which includes unskilled labourers, forestry, steel and mine workers, and atheletes, and "exceptionally active" including lumberjacks and heavy construction workers. Using the moderate activity category figures for energy requirements (shown in Table 1) as a reference point (Value = 100) the following conversion factors for the other categories may be used:

| | men | women |
|---|---|---|
| Light activity | 91.3 | 90.0 |
| Moderate activity | 100.0 | 100.0 |
| Very active | 117.3 | 117.5 |
| Exceptionally active | 134.7 | 137.5 |

No distinction for activity category is made for children up to the age of 19 years. Distinction into sexes is only made from the age of 10 years.

Units of suggested energy intakes in the dietary standard (Table 1) are given both in kilocalories as well as in Megajoules (MJ) following the International System of Units. One megajoule is equivalent to 239 kilocalories.

### Protein

The dietary standard for protein has been obtained by utilising the recommendations of the joint FAO/WHO report on energy and protein requirements (WHO, 1973). In fixing the suggested intakes for protein, the quality of protein consumed is of much importance. The lower the quality, the larger the amount that has to be consumed to meet the needs of the body for protein. The quality of protein according to its essential amino acid composition of a given food can be expressed as a score. A score of 100 denotes an "ideal protein", which is closely approximated by the protein of whole egg. A score of 70 characterizes the quality of protein consumed in Malaysia which is a mixture of mainly vegetable protein with some animal protein. This parallels previous recommendations of the Institute of Medical Research (IMR, 1962) as well as that of the Technical Subgroup (1969) where the comparable Net Protein Utilisation (NPU) index value of 70 was used.

### Calcium

Calcium intakes suggested in Table 1 follow the recommendations of a report on calcium requirements by an FAO/WHO expert group (WHO, 1962). Identical suggestions were made by the Institute of Medical Research (IMR 1962) and the Technical Subgroup (1969).

# Table 1

SUGGESTED DAILY DIETARY INTAKES (1) - PENINSULAR MALAYSIA - 1973

| | Age | Weight | Activity | Energy | | Protein Score=70(3) | Ca | Fe (4) | Vit.A (Retinol) | Vit.D (5) | Thiamine | Ribo-flavin | Niacin Equiv | Folic Acid (6) | Vit.$B_{12}$ (7) | Ascorbic Acid |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Years | Kg | | Kcal | MJ(2) | g | mg | mg | mcg | mcg | mg | mg | mg | mcg | mcg | mg |
| ADULTS | | | | | | | | | | | | | | | | |
| MEN | 20 - 39 | 55 | Moderate | 2,530 | 10.6 | 45 | 450 | 9 | 750 | 2.5 | 1.0 | 1.5 | 16.7 | 200 | 2.0 | 30 |
| | 40 - 49 | 55 | Moderate | 2,400 | 10.0 | 45 | 450 | 9 | 750 | 2.5 | 1.0 | 1.4 | 15.8 | 200 | 2.0 | 30 |
| | 50 - 59 | 55 | Moderate | 2,280 | 9.5 | 45 | 450 | 9 | 750 | 2.5 | 0.9 | 1.4 | 15.0 | 200 | 2.0 | 30 |
| | 60 - 69 | 55 | Moderate | 2,020 | 8.5 | 45 | 450 | 9 | 750 | 2.5 | 0.8 | 1.2 | 13.3 | 200 | 2.0 | 30 |
| | 70+ | 55 | Moderate | 1,770 | 7.4 | 45 | 450 | 9 | 750 | 2.5 | 0.8 | 1.2 | 13.0 | 200 | 2.0 | 30 |
| WOMEN | 20 - 39 | 50 | Moderate | 2,000 | 8.3 | 37 | 450 | 28 | 750 | 2.5 | 0.8 | 1.2 | 13.0 | 200 | 2.0 | 30 |
| | 40 - 49 | 50 | Moderate | 1,900 | 7.9 | 37 | 450 | 28 | 750 | 2.5 | 0.8 | 1.2 | 13.0 | 200 | 2.0 | 30 |
| | 50 - 59 | 50 | Moderate | 1,800 | 7.5 | 37 | 450 | 9 | 750 | 2.5 | 0.8 | 1.2 | 13.0 | 200 | 2.0 | 30 |
| | 60 - 69 | 50 | Moderate | 1,600 | 6.7 | 37 | 450 | 9 | 750 | 2.5 | 0.8 | 1.2 | 13.0 | 200 | 2.0 | 30 |
| | 70+ | 50 | Moderate | 1,400 | 5.9 | 37 | 450 | 9 | 750 | 2.5 | 0.8 | 1.2 | 13.0 | 200 | 2.0 | 30 |
| PREGNANCY | 1st trimester | | | + 150 | +0.6 | - | - | - | - | - | - | - | - | - | - | - |
| | 2nd, 3rd trimester | | | + 350 | +1.5 | +13 | +750 | - | - | +7.5 | +0.2 | +0.2 | +2.3 | +200 | +1.0 | +20 |
| LACTATION | for 6 months | | | + 550 | +2.3 | +24 | +750 | - | +450 | +7.5 | +0.2 | +0.3 | +3.6 | +100 | +0.5 | +20 |
| INFANTS | 0 - 1 | | | 112 per kg/day | 0.47 per kg/day | 2.4 - 1.4 per kg/day | 550 | 10 | 300 | 10.0 | 0.4 | 0.6 | 6.6 | 50 | 0.3 | 20 |
| CHILDREN | 1 - 3 | | | 1,360 | 5.7 | 23 | 450 | 10 | 250 | 10.0 | 0.5 | 0.8 | 9.0 | 100 | 0.9 | 20 |
| | 4 - 6 | | | 1,830 | 7.6 | 29 | 450 | 10 | 300 | 10.0 | 0.7 | 1.1 | 12.1 | 100 | 1.5 | 20 |
| | 7 - 9 | | | 2,190 | 9.2 | 35 | 450 | 10 | 400 | 2.5 | 0.9 | 1.3 | 14.5 | 100 | 1.5 | 20 |
| BOYS | 10 - 12 | | | 2,600 | 10.9 | 43 | 650 | 10 | 575 | 2.5 | 1.0 | 1.6 | 17.2 | 100 | 2.0 | 20 |
| | 13 - 15 | | | 2,450 | 10.3 | 53 | 650 | 18 | 725 | 2.5 | 1.0 | 1.5 | 16.2 | 200 | 2.0 | 30 |
| | 16 - 19 | | | 2,580 | 10.8 | 54 | 500 | 18 | 750 | 2.5 | 1.0 | 1.5 | 17.0 | 200 | 2.0 | 30 |
| GIRLS | 10 - 12 | | | 2,350 | 9.8 | 41 | 650 | 10 | 575 | 2.5 | 0.9 | 1.4 | 15.5 | 100 | 2.0 | 20 |
| | 13 - 15 | | | 2,200 | 9.5 | 45 | 650 | 24 | 725 | 2.5 | 0.9 | 1.3 | 14.5 | 200 | 2.0 | 30 |
| | 16 - 19 | | | 2,100 | 8.8 | 43 | 500 | 28 | 750 | 2.5 | 0.8 | 1.3 | 13.9 | 200 | 2.0 | 30 |

NOTES:

(1) Adapted from:
- a. Recommendations by PHI/WHO/IMR/UM Technical Subgroup, 1969.
- b. WHO: Tech. Rep. Series No. 230, Geneva, 1962.
- c. WHO: Tech. Rep. Series No. 301, Geneva, 1965.
- d. WHO: Tech. Rep. Series No. 362, Geneva, 1967.
- e. WHO: Tech. Rep. Series No. 452, Geneva, 1970.
- f. WHO: Tech. Rep. Series No. 522, Geneva, 1973.

(2) MJ = Megajoules

(3) Score - a term used to describe the quality of proteins on the basis of essential amino acid composition.

(4) Recommended intakes of iron based on absorption of iron under different dietary conditions. For Malaysia, absorption assumed to be 10%.

(5) Adequate exposure to sunlight may partially or totally replace dietary Vitamin D. No values for Vitamin D content of foods available in food composition tables for Malaysia.

(6) No values for Folic Acid content of foods yet available in food composition tables for Malaysia.

(7) No values for Vitamin $B_{12}$ content of foods yet available in food composition tables to Malaysia.

## Iron

Recommendations for iron intakes are based on a report of a joint FAO/WHO expert group (WHO, 1970) which related iron intake to the capability of absorption of iron by the human body. Absorption of iron has been found (WHO 1968) to be related to the composition of diets consumed. The diets containing a higher proportion of calories from foods of animal origin tend to promote better absorption. Studies in a rural area in Peninsular Malaysia (Teoh, 1969) showed that during festival days, foods of animal origin contributed 12.5 percent of the calorie intake whilst during non-festival days, this amounted only to 6.6 percent. According to the above report (WHO, 1970), this would allow only a 10 percent absorption of iron consumed. For rating purposes, this absorption rate is assumed and women are also taken to be menopausal by age 50 years.

## Vitamin A

In considering the recommended daily dietary intakes for vitamin A, the recommendations of a joint FAO/WHO report (WHO, 1967) were followed. In view of the availability of crystalline vitamin A alcohol (retinol) as a standard, the practice of expressing vitamin A values in terms of international units (IU) was no longer deemed necessary. Thus, recommendations for intakes of vitamin A are given in terms of microgrammes of retinol (Table 1). A complicating feature in the statement of vitamin A intake is the possibility of consuming vitamin A from different sources. Animal sources give mainly retinol and vegetable sources furnish the less efficient provitamin beta-carotene which has to be converted by the human body into retinol a process involving losses. Diets in certain rural areas in Peninsular Malaysia derive more than 80 percent of their vitamin A from beta-carotene (Teoh, 1972). Urban diets of the higher socio-economic groups probably contain less from vegetable sources. Whatever the composition of sources of vitamin A in the diet, enough of the dietary mixture should be consumed to give an equivalent total activity of 750 microgrammes of retinol in the adult. If the diet contains a large proportion of the less efficient pro-vitamin, beta carotene, then a large amount has to be consumed so that ultimately, within the human body and after conversion, an equivalent activity of 750 microgrammes of retinol is available to an adult. The conversion factor given by the FAO/WHO report (WHO 1967) is:

1 microgramme of beta-carotene is equivalent to 0.167 microgramme of retinol.

## Vitamin D

Recommendations for the dietary standards for vitamin D are based on the suggestions of a joint FAO/WHO report (WHO, 1970). Adequate exposure to sunlight, may however, partially or totally replace dietary vitamin D.

## Thiamine, Riboflavin and Niacin

Values in the recommended daily dietary intakes (Table 1) for thiamine, riboflavin and niacin are based on a joint report of an expert FAO/WHO group (WHO, 1967). Since these vitamins are related to energy metabolism, recommendations for their dietary intakes are related to the suggestions for energy intakes. The following values were used in the compilation of the intake levels:

| | | |
|---|---|---|
| Thiamine | : | 0.4 mg thiamine per 1000 kilocalories |
| Riboflavin | : | 0.6 riboflavin per 1000 kilocalories |
| Niacin | : | 6.6 mg niacin equivalents per 1000 kilocalories |

Further, it was felt that previous recommendations (IMR, 1964 and Technical Subgroup, 1969) of certain minima for intakes of these vitamins be retained for the adult groups. These minimum values would operate when the suggested energy intake values for adults are below 2000 kilocalories. The minima (per day) may be stated as:

| | | |
|---|---|---|
| Thiamine | : | 0.8 mg thiamine |
| Riboflavin | : | 1.2 mg riboflavin |
| Niacin | : | 13.0 niacin equivalents |

It will be noted that recommendations for niacin are stated in 'niacin equivalents'. This acknowledges the ability of the human body to convert tryptophan into niacin. Thus the equivalent of 1 mg of niacin is 60 mg tryptophan.

## Folate, $B_{12}$ and Ascorbic Acid

Dietary standards for Folic acid, vitamin $B_{12}$ and ascorbic acid are based on the recommendations of a joint FAO/WHO report (WHO, 1970).

## USE OF DIETARY STANDARD

From the foregoing it is apparent that a table of recommended daily dietary intakes is calculated on the basis of certain assumptions. Fundamentally it represents current knowledge of the amounts of nutrients believed to be required by normal persons in order to maintain good health. It also incorporates within the values cited a "safety margin" in order to cover the "requirements" of about 95 percent (+ 2 standard deviations) of individuals in the population in their needs for particular nutrients). The recommendations are expected to change periodically as new knowledge about requirements of nutrients come to light. Thus the recommended intakes can only be used as a *guide* when applied to individuals or communities.

The recommended, daily dietary intakes are arranged in a table for ease of use. The values for pregnant and lactating women as given as additional amounts of nutrients "required ' which are to be added to the values for the non-pregnant and non-lactating state in the same age group. A dash (—) in these rows denote that no extra intakes are recommended.


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# A Battered Child

by

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## Introduction

Physical punishment of children by parents and adults has been justified over the ages in the belief that it is necessary to incalculate discipline in children. But the dividing line between "acceptable" punishment and child abuse has been vague and has always depended on the culture and mores of the society involved. It is also an emotionally charged issue as a case of "Battered Child Syndrome" would normally arouse the anger, abhorence and censure from the observer. As defined "Battered Child Syndrome" is "non-accidental physical assault or injury, minimal or fatal, inflicted on children by others caring for them." (Gill, 1968). This paper hopes to illustrate the psychodynamics of a family with a battered child and the problems arising from its management.

## Case History

Jill, a six year old twin girl was brought by her mother to a local doctor. The mother had complained that Jill was unable to cope with kindergarten and wanted to know if she could start normal school in a month's time. She also complained that Jill was disobedient and stubborn. She was referred to a University Hospital, for investigation of behaviour problem and suspected Battered Child Syndrome.

At the first interview, both parents described Jill as a very difficult child. She had been the source of great distress since birth, especially to the mother.

Her mother had planned for the second pregnancy. She was pleased to have a girl when the first twin was born but was surprised that a second child was on the way.

Jill, weighing 3 lbs. 10 ozs. could not suck and had to be tube-fed and nursed in an incubator. Her mother doubted if she could live. She was upset and ashamed that Jill was a difficult child who cried and screamed continously. Pat, birth weight 4 lbs. 8 0zs., was discharged after one month in the maternity home. Two months later, when Jill was 5 lbs. the mother had to accept her home after a staff of the maternity home had paid her a home visit to insist again on Jill's discharge. A servant had left one month earlier.

A week after Jill's return, the father was suddenly called away in his line of duty. The mother had to care for the three children. Tom, the eldest, (one and a half old) was beginning to crawl and walk. The mother was under severe stress at this crucial time. She slapped and shook Jill whenever she cried or refused her feeds.

The father returned five months later. Her mother said that Jill destroyed her toys, tore curtains, was messy and untidy, soiled her pants, had to be coaxed to eat and was generally unresponsive to her demands. The mother viewed this as Jill's stubborness and defiance of her. She slapped, shook, punched and caned Jill until her anger was dissipated. This occurred several times a day or a week.

Jill for the past one year, had not been able to

cry and did not attempt to hide or run from the beatings.

When Jill was four years old, she sustained a fracture of the left femur. The parents said that they knew of the fracture three days later when they noticed her limping. They denied any knowledge of the cause. Jill's brother said she fell off a swing.

Six months ago, Jill sustained a two inch incised wound, muscle deep, on her right forearm. The mother told the father that she had cut herself accidentally. Jill herself on the second day of admission to the present hospital said her brother cut her. But after Jill had been warded for sometime, and on being reassured that what she said would not be conveyed to her mother, revealed that her mother had cut her on the forearm. The father admitted later that he had suspected his wife but had not wanted to confront her on this.

Jill also was able to show the ways she was beaten including mimicing the strangle hold her mother had requently used on her neck.

### Developmental Milestones and Mental Status of Jill

Jill was a full term twin delivery. She weighed 3 lbs. 10 ozs. There was no history of respiratory distress after birth but she was unable to suck.

Her earlier milestones were not available but she talked at 18 months (one to two words) and walked at over two years. Her twin sister was ahead of her at all stages of development.

Jill had attended one year of kindergarten and could only count to three and recall her alphabets up to E. Her twin sister was able to count to ten and recall all alphabets.

Jill's verbal ability was adequate to answer most questions.

She was a friendly girl, mixing well with the other children in the ward, but did not form any attachment to the children or nurses.

She was not depressed even when the parents left the ward. There was no expression of any acute distress.

Her behaviour in the ward was contrary to the history of the mother. There was no temper tantrums, no destructive behaviour, she was contented and ate well. Significantly, the responses of the nurses were that the was a well behaved child.

### Physical Examination

At three feet four inches and thirty pounds, Jill was below the third percentile in both height and weight. Her skull circumference was 21½ inches. She looked wizen.

There was multiple small scars on the abdomen and neck. Those on the neck looked like nail scratches. There was a scar of an incised wound on the right forearm and a callus formation on the left femur.

She walked without a limp. Other systems were nromal.

### Investigations

Routine blood examination and urinanalysis were normal
V.D.R.L. was non-reactive
X-rays of the chest, skull, right forearm were normal.
Blood Group A, Rhesus positive
(Twin sister blood group AB, Rhesus positive).

### Family dynamics

The father, 32 years old, was a passive, soft-spoken man. He appeared calm and collected and resigned to the fact that his wife used to beat Jill. He was well educated and held a responsible job. His duties took him away from home for months at a stretch. He was brought up in a large family and his father was a retired school teacher who did not believe in caning his children

Jill's mother, 34 years old was an obsessional woman and expected her children to respond to her demands exactly. Her husband described his reaction to her obsessive nature of demanding him to put his shoes in order as "I still can't get used to it". She had been educated till her L.C.E. and had worked as a clerk before marriage.

Jill's mother complained that her husband had not really helped her to care for the children as he was away from home for long stretches and also that when he was home, he preferred to stay out after work.

Her childhood was described as a happy one. Her own father had been a quick-tempered man and used the cane on his children though it was not frequent.

Jill's father in a separate interview, revealed he preferred to stay out as he did not want to inter-

fere when Jill was beaten. Many years ago, he had attempted to, but had got into quarrels with his wife who would then unleash further abuse on Jill or accuse him of investing Jill with his bad characteristics. She claimed that the two other obedient children had inherited her qualities. This made him angry. Though passive, he could and did make his wife angry but being silent in quarrels and made insulting remarks to his wife after she had calmed down.

The older boy was very much a mother's boy. He was very obedient to her and helped her with housework. The other twin was also more responsive towards her.

Management

It was realized at the earliest that management of Jill involved counselling the parents, especially the mother.

Jill was given a psychological test (McCarthy's Scale) and found to be handicapped in all major areas of functioning with an overall Intelligence Quotient of 67. Based on this finding and Jill's present difficulty to cope with kindergarten, it was decided that she could not attend normal school but would need specialized schools or more individualized teaching. Her twin's score was higher by about ten points in all scales with an overall Intelligence Quotient of 85. This was discussed with the parents and they accepted this.

Jill was referred to the pediatrician but except for her small physique and under weight, she was normal physically. All investivations were negative too.

The role the parents played was discussed with both parents and throughout the discussion, no attempt at fault finding or censure was made. Both parents were assured that the doctor understood the difficult period they had with Jill. It was stressed that the management of Jill would need the involve- of both parents and especially the mother as she was with Jill most of the time. The father had said he was urgently required back in another state on exigency of service. The mother said that she could not stay without the father. Both parents left the Hospital. It was difficult to engage the mother in any form of therapy. Attempts to prolong both their stay were fruitless.

There was time for only one two-hour session with the mother on the second day of Jill's admission and another two-hour session with the father when they returned after ten days.

In the interview with the mother, it was pointed out to her that Jill was unlike a normal child in that she was not very bright and would not respond as expected. It was pointed out to her that perhaps her expectation of Jill was based on the responses of Pat who was smarter and that Jill might not be able to come up to her expectations. It was pointed out also that Jill had been a difficult child to care for, and could test the patience of most mothers. It was suggested to her that future handling of Jill would need to take into consideration that Jill was a "slow" child.

Her own feelings about her husband were discussed. She felt that he could be more helpful in helping to care for the children. She was resentful that he was not at home evenings.

In a separate interview with the father, he revealed he had suspected his wife of physically abusing Jill but had not wanted to bring this up with her for fear of her response. He admitted to leaving the home in the evenings in order not to hear her nag him about the children. It was suggested to him that if his wife was unable to obtain attention and assurance from him, she could turn to the children for attention and Jill being unable to respond as the other two children could, might well be the source for her to vent her anger. It was suggested that if he could improve their interaction, the family as a whole and Jill in particular would benefit. It was suggested that further sessions with him and his wife could be useful.

There was only one session with both the parents and at this session, the future of Jill was discussed. A specialized day school for the mentally retarded was advocated. The placement of Jill was discussed and three alternatives were available:

(a) to stay with parents
(b) to stay with foster parents
(c) to stay with grandparents in another state, X.

The last option was most favourable with the interests of Jill's education in mind as there was a mentally handicapped children's school in X, 200 miles away from home. Secondly, the grandparents who also stayed in X, had volunteered to care for Jill a few years ago.

The parents decided to think it over and left for home. About five days later the father returned

on his way home from a service trip and wanted to take the child back. They had decided to allow Jill to stay with her grandparents but he was too busy to arrange this as yet. It was pointed out to him the danger of Jill being further assaulted on returning home and he promised to keep a closer eye on the child. An appointment was fixed for both parents to come with Jill at the earliest convenient time for follow-up, though the father had reservations if his wife would come. When the child goes to stay with her grandmother, the local social worker shall be contacted regarding follow-up.

## Discussion

A battered child does not exist alone. There must be a battering parent (or others) and a family environment to conceive and perpetuate the abuse. Each parent's intrapsychic functioning and the family interaction as a whole has to be under stood.

Jill was brought to a local doctor for her behaviour problems and for assessment if she could attend normal school as the parents had felt she was retarded. On routine physical examination, he noticed that the child had multiple scars on the body and was stunted in both height and weight. Suspecting child abuse and aware of the problems involved in confirming the diagnosis, counselling of the parents and fear of recurrent abuses. the doctor referred her here for hospitalization and further management. On going further into the history, it was revealed that the child had been physically abused by the other, and that one was dealing not only with a mentally retarded child but also an abusing mother.

The contribution of Jill to being abused could not be ignored. Her birth was unexpected. She was born with maturation handicaps of being unable to suck, and was so sickly, she had to be nursed in hospital for three months. She was also a difficult child then as her screaming had upset nurses and mother, who had felt this was Jill's rejection of her. It was interesting to note that Pat who was raised in the same environment but without Jill' handicap, was not abused.

The separation of mother and child for three months might have hampered the development of attachment of mother to the child too. At the end of three months, the mother was strenously trying not to take Jill home. Maternal deprivation could have contributed to Jill's poor intellectual ability. M. Rutter (1972) in his review of maternal deprivation stressed that poor child-parent interaction contributed to intellectual impairment.

When she was eventually pushed home, the mother was in a state of severe stress. She had no servant or relative to help care for the one year old boy who was beginning to crawl and walk. There was the other twin to care for and to addition, the husband had to leave on service immediately. She even had fears of her husband being killed on duty. Jill, a difficult child with feeding problem and who cried easily aggravated her mother's insecurity and anger.

The mother herself, an obsessive, demanding person, expected her children to conform to her needs and wishes. Steele and Pollock (1968) stated "an obssessive-complusive character structure" being "one of the potent accessories in instigating as" abuse . The abusing mother expects the child to gratify her wishes, at the same time ignoring the child's own needs. Jill's mother had expected that "eat is eat", "sit is sit". Her two other children especially the son had been able to respond but not Jill.

Jill's mental retardation had made her less responsive to her mother's demands. Mental retardation, as other factors, like health status, illegitimacy, sex, time of birth, facies, could be a contributing factor to being abused. Morse (1970) found 43% of abused children to be mentally retarded.

The mother had not been subjected to abuse as a child, though it had been observed that some battering parents had also been abused in childhood. But her own mother had also been obsessional. Identification and at the same time conflicts with her own mother might have occurred but the reluctance of being involved in therapy had aborted any attempt at exploration in this area.

The father had played a passive role and this passivity had an element of condoning his wife's actions. It is not unusual for the non-abusing parent to consciously or unconsciously instigate abuse. In this case, the father had realized that any interference on his part might unleash more assault on Jill or a quarrel with him and he undertook to stay away from home. It could be his guilt feelings in not interfering that led him to spending more time with friends. But he did realize he could make his wife angry and had on occasions done this with intent.

Child abuse, is not an entirely psychiatric condition but a psychosocial one as well and the social worker can contribute in managing the case. But in Jill's case, there were difficulties to involve the female social worker as both parents did not stay in Kuala Lumpur and they attended the hospital only on brief visits. There was no time at all. But it was realized that a female social worker could participate as a co-therapist, in dealing especially with the mother who might have been more comfortable in talking to a female in some areas. It was also realized that home visits could be better be done by the social worker and to be on the spot to give advise to the mother on handling the child and to provide a good mother figure for her to identify with.

The Battered Child Syndrome involves not only the medical profession, but also social and legal agencies (Woon, et al, 1974). But it is the responsibility of the medical profession to assume leadership in this field. The doctor is in a position whereby he is the first person most likely to come into contact with these cases. Understandably, this puts him in a difficult position in dealing with the abused child and his parents. He may have to assume the roles of marriage counsellor, social worker, psychiatrist and possibly a witness in court. This may even be more difficult if he is also the family physician and had been caring for the family for many years. But his responsibility is for the welfare of the child and if a physician is emotionally involved with the family, an immediate referral would be essential, bearing in mind that 10% of battered children die and one-third of the remainder may be abused again. (Kempe, 1974: Morse et al, 1970).


## Summary

A six year-old girl was brought by her mother to see a local doctor for advice on placement in school and behaviour problem. There was an inconsistent history of fracture of left femur at four years old. Physical examination revealed numerous scars on the neck and body. There was a linear, two-inch scar of a deep incised wound on her right forearm. The doctor referred the child to a hospital for the management of her presenting problems and suspected battered child syndrome. Management included an evaluation of the physical, social and psychological aspects of the child, the personality and behavior of the mother and the child's environment, viz. her father, her siblings, their family interaction and the social environment.



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# The Ovaries at Abdominal Hysterectomy- Conservation or Removal?

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Opinion is still divided on the subject of prophylactic removal or conservation of the ovaries at hysterectomy for benign conditions in premenopausal women. There is incomplete presentation of arguments in favour of conservation of ovaries as opposed to the alleged benefits of prophylactic removal. Several facts need to be established.

Firstly, ovarian surgery during hysterectomy carries no risks.

Secondly, the ovaries should be removed at hysterectomy if the ovaries are hopelessly diseased even if the woman is young; and if the hysterectomy is done for malignant disease of the uterus, bilateral ovarian tumours or even a unilateral benign ovarian tumour in a woman aged 45 years and over (Grogan, 1967; Jeffocate, 1972).

Thirdly, ovarian function continues after total hysterectomy (Barcroft - Livingston, 1954; Beavis et al, 1969; Grogan, 1967; Whitelaw, 1958), and even after the menopause (Meisels. 1966; Procope, 1968). Function has also been recorded in patients with congenital absence of the uterus (Brown et al, 1959). Following hysterectomy, normal ovulation and ovarian function occurs in 30.0 to 75.0 % patients (Beavis et al, 1969; Grogan, 1967; Whitelaw, 1958). Barcroft-Livingston (1954) recorded continuing ovarian function in 95.0% of patients after 3 years, and in 59.0% of patients after 5 years following hysterectomy.

Fourthly, Beavis et al (1969) established that two residual ovaries function more normally than one in the older women. They showed conclusively that normal ovulation occurred in 75.0% of patients with both ovaries conserved and in 27.0% of patients with one ovary conserved and that abnormal ovulation occurred in 10.0% and in over 20% of patients respectively. This observation implies therefore that one should either remove both ovaries of leave both behind at hysterectomy.

## ARGUMENTS FOR CONSERVATION

Bonney in 1937 stated "except in malignant disease, preserve the feminine sex glands intact - leave in her body the full amount of undiseased ovarian tissue that she possesses".

### *1. Continuing Ovarian Function following Hysterectomy*

Available evidences indicate that normal ovarian tissue conserved at hysterectomy continues to function normally. This is evidenced by way of vaginal cytology (Barcroft - Livingston, 1954); urinary hormonal studies (Beavis et al, 1969); basal body temperature charting (Whitelaw, 1958); and observations at subsequent laparotomy (Grogan, 1967). There is no evidence to show that the ovaries cease to function immediately following hysterectomy (Jeffcoate, 1972). There is therefore no reason to remove normal ovaries at hysterectomy in the pre-menopausal woman.

*2, Post-menopausal symptoms following ovarian removal in pre-menopausal women*

These symptoms result from vasomotor instability with a tendency to flush or blush and are present in 6.0% of patients without operation, in about 50.0% of patients with hysterectomy and unilateral salpingo-oophorectomy, and in about 25.0 to 30.0% of patients with hysterectomy and bilateral salpingo-oophorectomy (de Neef and Hollenbeck, 1966; Richards, 1951; Sessumsr and Murphy, 1932).

Contrary to the above reports, Jeffcoate (1972) commented that the incidence of severe menopausal symptoms can be lowered from 50.0 to 1.5% if one ovary is conserved at hysterectomy.

It is argued, therefore, that simultaneous ovarian removal at hysterectomy in pre-menopausal women results in a high incidence of post-menopausal symptoms.

*3. Risk of osteoporosis in pre-menopausal women*

The incidence of osteoporosis increases with age especially in women. Nordin et al (1966) noted that osteoporosis occurs in 10.0 to 20.0% of menopausal women. Their observations were based upon the evaluation of 3 indices; the metacarpal index, the femoral index and the lumbar vertebral body bicon–cavity index, all of which are noticed to fall with advancing age.

The increased incidence of osteoporosis in menopausal women is related to oestrogen deficiency (Nordin et al, 1966). This probably works through the regulation of calcium absorption or excretion rather than a direct effect on bone matrix. The decrease in hormonal stimulus of osteogenesis in addition to the decrease in activity in old age leads to decreased bone formation, which in the presence of normal bone resorptive activity leads to osteoporosis.

Evidences clearly show that ovarian hormonal function before the menopause protects against the onset of osteoporosis (Nordin et al, 1966), and therefore preservation of ovarian function until the age of the natural menopause is desirable.

*4. Risk of atherosclerosis and premature coronary artery disease*

Atherosclerotic heart disease is commoner in males than in premenopausal women but the difference becomes less marked near menopause. After menopause, the incidence in females gradually exceeds that in males.

There is an increased incidence of clinical coronary artery disease in ovariectomised females over controls (Oliver and Boyd, 1959; Robinson et al, 1959). Positive long-term therapeutic effects have been reported in males with coronary artery disease when treated with oestrogens (Marmorston, 1962; Oliver and Boyd, 1961; Stamler et al, 1959).

There is no question on the ability of oestrogens in reducing total serum cholesterol, increasing alpha-lipoprotein and lowering or maintaining the cholesterol-phospholipid ratio. All these biochemical changes are desirable in achieving primary and secondary prevention of coronary artery disease (Berkson et al, 1964).

The great weight of evidence at present therefore suggests that endogeneous oestrogen secretion significantly protects the pre-menopausal woman from the on slaught of premature coronary artery disease and therefore conservation of ovarian function in such women is desirable.

## ARGUMENTS FOR REMOVAL

*1. Fear of Malignancy in residual ovaries*

This is the main argument for the prophylactic removal of normal ovaries at hysterectomy. No method for early detectior of ovarian cancer is available and chances of eradication are slim once the tumour is advanced (Grogan, 1967).

Jeffcoate (1972) quotes a risk of malignancy in residual ovaries, of one in 300 to 3000 hysterectomies compared to reports of higher risks of 3.6% to 8.2% (Counseller et al, 1955; Grogan, 1967; Pemberton, 1940; Randall, 1962; Thorp, 1950). The latter authors also commented that of the cases of cancer in residual ovaries, about 40 to 50% were less than 40 years of age at time of hysterectomy while 50 to 60% were 40 years and over. Therefore, younger women are equally liable to develop malignancy in residual ovaries.

The reality of this potential problem favours the prophylactic removal of ovaries at hysterectomy even in pre-menopausal women but one must admit that the calculated risk of malignancy in residual ovaries is probably small.

*2. Development of Benign Tumours in residual ovaries*

This risk varies from 3.4 to 13.7% (Beavis et al, 1969; de Neef and Hollenbeck, 1966; Grogan, 1967); the principal benign tumours being mucinous and serous cystadenomas and "endometriomas". All these necessitated removal surgically and it is felt that such a procedure would have been unnecessary if prophylactic removal of the ovaries at hysterectomy had been carried out. Therefore, the possibility that benign ovarian pathology may develop in residual ovaries following hysterectomy has been used as an argument against conservation (Grogan, 1967). This risk is however of minor significance.

*3. "Residual Ovary Syndrome".*

Grogan (1967) listed this clinical entity as one of the principal indications for surgical intervention in residual ovaries. The main features include pelvic pain (47.8%), pelvic mass (26.0%), pain and mass (21.7%) and dyspareunia (4.2%). The cause of pain was related to a combination of continued or abortive attempts at ovarian function, ovarian dysfunction secondary to perioophoritis or adhesions and/or ovarian endometriosis. None of these are, however, life threatening and it appears that Grogan (1967) has overemphasised this clinical syndrome in his enthusiasm for prophylactic removal of ovaries at hysterectomy.

*4. Ovarian Dysfunction in residual ovaries*

The occurrence of this, is as high as 47.0% (Grogan, 1967) and is evidenced by the finding of cystic, atretic and hemorrhagic follicles in residual ovaries at subsequent laparotomy. It is suggested that ovarian dysfunction might predispose to the risks of malignancy and to the development of the "residual ovary syndrome", both conditions necessitating surgical intervention at same stage. These associations are however not supported by conclusive evidence and the problem of ovarian dysfunction in residual ovaries would appear to be of minor significance at the present experience.

*5. Endometriosis in residual ovaries*

The incidence of endometriosis in residual ovaries is 10.0% (Grogan, 1967) compared to about 3–4% in the general population (Jeffcoate, 1972). Continued function leads to pain which can be controlled by hormonal treatment, failing which surgical intervention would be necessary.

## CONCLUSION

It is evident that the disadvantages of ovarian removal at hysterectomy in pre-menopausal women outweighs the advantages. The calculated risks for malignancy is still admittedly small and justification for prophylactic removal of ovaries on this basis alone is not recommended. The dangers of future atherosclerotic disease, premature onset of coronary artery disease and osteoporosis in pre-menopausal women following ovarian removal appear greater than the threat of future malignancy and the other less significant conditions in residual ovaries. The finding that ovaries which are functioning normally before hysterectomy continue to function normally after hysterectomy adds further weight to the policy of ovarian conservation during hysterectomy.

It is an inevitable conclusion that routine bilateral oophorectomy should not be done at the time of total hysterectomy in a pre-menopausal woman unless a definite indication exists.

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# Maternal Mortality from septic abortions in University Hospital, Kuala Lumpur from March 1968 to February 1974

by

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In spite of the advances made in medicine in general and in obstetrics and gynaecology in particular, maternal deaths from abortions continue to be a leading cause of maternal mortality in many countries. In the most recent report of the confidential enquiries into maternal deaths in England and Wales, abortion remains the commonest cause of maternal deaths (1). As the number of maternal deaths from all causes has fallen, abortion has become even more important as a major cause of death. In the University Hospital, Kuala Lumpur, during the six-year period from March 1968 to February 1974, there were 1699 admissions from abortions with 4 deaths, while the total maternal deaths from all causes was 13. The mortality rate from abortion during this period was 0.241 per 1000 pregnancies.

The number of abortion cases admitted into the hospital during the six-year period of this study has increased steadily. In 1969, 205 cases of abortion were admitted while in 1973, this number has more than doubled to 448 admissions from abortion (Table I). It will be of interest to review briefly the 4 maternal deaths from abortion and outline the avoidable causes and preventive aspects.

## CASE REPORTS

*Case 1* A 21 year old primigravida was admitted on 5.5.69 with septicaemic shock form septic abortion. She gave a history of 10 weeks amenorrhoea and induced abortion 2 days prior to admission. Her condition improved initially but deteriorated on the following day. She developed pulmonary oedema, renal failure and repeated cardiac arrests, and died during an attack of cardiac arrest. Cause of death was septic abortion leading to septicaemic shock, renal failure and cardiac arrest.

*Case 2.* A 28 year old gravida 7, unbooked patient was admitted on 26.6.72 with vaginal haemorrhage and hyperpyrexia after about 26 weeks amenorrhoea. She subsequently aborted the foetus, went into a state of profound shock, and died from cardiac arrest. Autopsy confirmed death from septicaemia following septic abortion.

*Case 3.* A 20 year old gravida 3, para 2 was admitted on 5.6.73 with threatened abortion after a history of 11 weeks amenorrhoea. Evidence of sepsis was apparent 3 days later when she had fever and a purulent vaginal discharge. She was put on intramuscular penicillin and streptomycin. Her

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condition deteriorated when she had vaginal haemorrhage and shock and she died following an attack of cardiac arrest. Autopsy showed evidence of septicaemia, disseminated intravascular coagulation, and thrombosis in the superior sagittal sinus and cerebral veins.

*Case 4.* A 38 year old gravida 6, para 5 was seen by a general practitioner on 5.1.74 and diagnosed as having missed abortion, the same doctor having seen her a month previously in his clinic and she was said to be pregnant without any complication then. She saw the doctor again on 7.1.74 when she was found to have a fever and foul-smelling vaginal discharge. She was admitted to a private hospital, put on antibiotics and induced with an intravenous pitocin drip. After aborting the fetus, she had retained placenta which was removed manually under general anaesthesia. She was in shock 2 hours later. She improved initially with intravenous fluids, plasma and blood. Next morning she was noticed to be jaundiced and hypotensive again, and she was transferred to the Intensive Care Unit of the University Hospital on 9.1.74. She was put on positive pressure ventilation, antibiotics, plasma expanders, isoprel and phenoxybenzamine drip. There was slight improvement but she was noticed to have generalised bleeding. Six hours after admission she suddenly had a cardiac arrest and failed to respond to attempts at resuscitation.

## DISCUSSION

The number of abortion cases admitted to the University Hospital during the period of study has shown a steady increase. This is probably also the experience in most major hospitals in West Malaysia and is due to an influx of rural population into urban areas coupled with the shortage of housing and the stresses associated with this change in environment. The rapid increase in number of factories and industries around the urban areas may be a major cause in the sudden increase in the number of abortions admitted to hospitals while the number of deliveries in the same hospitals have only shown a small increase during the same period (Table 1).

Of the four abortion deaths, 3 patients admitted to attempts at inducing abortion while in the remaining patient (Case 3) induced abortion was denied by the patient although her husband thought it could have taken place. Nevertheless, all 4 cases of abortion deaths occurred in patients with septic abortions and were therefore, theoretically, avoidable deaths. Hence the importance of preventive aspects of maternal deaths from abortion.

Webster (2) in a survey of maternal deaths stated that poverty, with all its attending evils, was the major factor in maternal mortality rather than race. Poverty was often associated with poor education, lack of motivation, and ignorance of the value of medical and health care. Klein and Karten (3) also reiterated that socio-economic status was a potent force affecting the patient's attitude to health and the outcome of pregnancy. Hence improvement of socio-economic status and health education of the people on the importance of medical care and the danger of induced abortion are important factors in the prevention of maternal mortality.

An effective family planning programme plays an important role in reducing maternal mortality from abortions as unwanted pregnancies are prevented. Again high motivation among doctors, nurses and patients is important for the success of any type of family planning project. Recent advances in technology of contraception, male and female sterilisation should be incorporated in these programmes. Techniques of contraception or sterilisation should be safe, simple, effective, inexpensive and suitable for adoption for the masses. When any further pregnancy would affect the physical or mental health of a patient, an effective method of sterilisation should be offered.

The question of whether liberalized abortion would reduce maternal deaths is a difficult one to answer as it does not provide a complete answer to this complex problem of abortion. It would certainly reduce the number of septic abortions and deaths from endotoxic shock. Initial experience in England and Wales after the introduction of the Abortion Act 1967 from 27 April, 1968 has shown a slight reduction in deaths from abortion, although the number of deaths from legalized abortion has increased (1). In a two-year study, from July 1970 to June 1972, of deaths from abortion in New York City following liberalization of the law, the reduction in maternal deaths was impressive (4). However, the mortality rate from abortion after 12 weeks gestation was 17.7 deaths per 100,000 compared to the rate of 1.2 per 100,000 for the early terminations. Therefore patients and doctors should be aware of the considerably increased risks of late terminations.

TABLE I

NUMBER OF ABORTIONS AND DELIVERIES PER YEAR

| YEAR | ABORTIONS | DELIVERIES |
|---|---|---|
| March–December 1968 | 71 | 1224 |
| 1969 | 205 | 2464 |
| 1970 | 222 | 2466 |
| 1971 | 338 | 2438 |
| 1972 | 341 | 2725 |
| 1973 | 448 | 3047 |
| January–February 1974 | 74 | 517 |
| TOTAL | 1699 | 14879 |

Prevention of sepsis in a case of abortion is most important. All patients with complications such as haemorrhage or sepsis should be referred to hospitals or clinics with facilities for dealing effectively with such complications. Any suspicion or evidence of sepsis in a case of abortion should be thoroughly investigated so that septic abortions are diagnosed early and antibiotic therapy commenced without any delay. Delay in instituting antibiotic therapy may allow the condition to be established and septicaemia to occur.

Endotoxic shock requires aggressive therapy. Intravenous steroids in pharmacological doses every 4 to 6 hours are often given to patients with endotoxic shock. In cases of hypovolaemic shock intravenous fluids may be administered rapidly with little risk, provided there is central venous pressure monitoring. The blood pressure should be maintained, and in cases of low cardiac output with high peripheral resistence, adrenergic drugs like isoproterenol and phenoxybenzamine are useful (5). Pulmonary support may be necessary in cases of respiratory failure, and a close watch should be maintained on renal function. cardiac function, metabolic and haemostatic complications. In cases complicated by the defibrination syndrome and there is evidence that the stimulus to clotting is still in operation, intravenous heparin appears to be of benefit, but it must be administered with caution (6). Blood should be taken for bacterial culture as soon as possible, and the patient started on an appropriate antibiotic or antibiotic combination early. With intensive care and careful choice of drug therapy, the number of deaths from endotoxic shock may be reduced.

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# Inappropriate secretion of Anti-Diuretic Hormone in chronic obstructive airways disease with chest infection and respiratory failure

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## INTRODUCTION

The syndrome of inappropriate secretion of anti-diuretic hormone (SIADH) has been described due to neoplasia. neurological disorders, drugs, endocrine and pulmonary diseases. Sometimes the aetiology is unknown and the condition is labelled as idiopathic.

This syndrome first recognised in bronchogenic carcinoma (Schwartz et al 1957, Schwartz et al 1960) has now been observed in a variety of chest illnesses. Hyponatraemia in far advanced pulmonary tuberculosis is not uncommon (Chung and Hubbard 1969, Bryant 1972). There is evidence that in some of these cases it is due to inappropriate secretion of ADH (Weiss and Katz 1965, Vorherr et al 1970). It has also been reported in staphyloccal pueumonia (Stormont and Waterhouse 1962), cavitating aspergilloma (Otz et al 1959) and other pulmonary infections (Bryant 1972, Rosenow et al 1972, Spanos and Spry 1974). Except in two cases, one reported by Rosenow et al (1972) and the other by Spanos and Spry (1974) where ADH estimations were done, the diagnosis in most of these cases is based on the clinical picture. In fact the hyponatraemic state in the two cases reported by Otz et al (1959) appears to be due to the iodide therapy rather than the cavitating aspergilloma.

We describe one case of chronic obstructive airways disease with chest infection and respiratory failure in which the syndrome of inappropriate secretion of ADH developed.

## CASE REPORT

A 70 year old male Chinese was admitted with a history of two days of severe dysnoea associated with a cough productive of purulent sputum. He first developed exertional dysnoea when he was 50 years old. This gradually became worse and was occasionally associated with chest infection which responded satisfactorily to treatment. At the age of 61 he developed (L) hemiparesis from which he recovered partially. He had smoked 50 cigarettes a day since the age of 18. In 1971 when he was 67 he was admitted and diagnosed as having chronic obstructive airways disease, chest infection and respiratory failure. The relevant biochemical findings then were: blood gases: pH 7.26. $pCO_2$ 59 mm. Hg, $Hb0_2$ saturation 94% (on $0_2$ via ventimask), Serum electorlytes: K 4.6 mEq/L, Na. 128 mEq/L, CI. 92 mEq/L and blood urea 42 mgm%. He was given broncho-dilators, antibiotics, steroids and $0_2$ via ventimask. He made good progress and on discharge was taught how to administer the $0_2$ via the ventimask at home. He stayed reasonably well till the present admission in October 1974 when he was found to be febrile, dysnoeic, cyanosed and clubbed. There was no ankle oedema or signs of dehydration. The B.P. was 170/110 and the pulse rate 84/minute with occasional extrasystole. In the chest the air entry was poor with bilateral rhonichi and creps. There was minimal (L) hemiparesis. Investigations showed Hb. 17 gm%, total white

14,000/c.mm with 98% polymorphs. Direct sputum smearfor a.f b. (x3): –ve. Urine microscopy: nad. X-ray chest showed emphesematous lungs and the E.C.G. showed a 'p' pulmonale with atrial ectopics.

He was managed with ampicillin, cephaloradine, ventolin, aminophylline, bisolvon prednisolone and 24% $0_2$ via ventimask. His condition improved and remained static till about the 10th hospital day when he again became dysnoeic, cyanosed and had rhonchi and creps in both the lungs. He developed tremors of the hands and weakness of all the four limbs. The upper limbs were mildly rigid. The jerks were equal and the planter response was down going. Gradually he lapsed into Coma II.

(The clinical progress, blood gases, serum electrolytes and other relevant studies are shown in figure I.).

Despite adequate ventilation his neurological condition remained unchanged. In view of the hyponatraemia the diagnosis of inappropriate secretion of ADH was considered and the relevant investigations were done. Meanwhile he was put on oral NaCl without any improvement. Because of his chronic obstructive airways disease he was put on only very minimal fluid restriction. Gradually his hyponatraemia and the neurological state began to improve. He became conscious and could speak a few words clearly and rationally. The tremors and rigidity disappeared and apart from the minimal (L) hemiparesis the power in the limbs improved. But as the neurological state improved his respiratory condition deteriorated. His sputum became thick and yellowish and the dysnoea worsened. At this stage the family decided to take him home.

FIG. I

| DATE | CLINICAL PROGRESS | THERAPY | BLOOD GASES | | | | SERUM ELECTROLYTES (mEq/L) | | | OTHER INVESTIGATIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | pH | $HCO_3$ | $pCO_2$ | $Hb.0_2$% | K | Na. | Cl. | |
| 11.10.74 | | | 7.44 | 26.7 | 41 | 90 | 3.8 | 130 | 80 | Blood urea 34 mgm%; Hb. 17 gm %. |
| 21.10.74 | DYSNOEIC. CYANOSED. TREMORS. WEAKNESS. RIGIDITY | | 7.37 | 29 | 62 | 87.5 | 4.8 | 114 | 72 | Blood urea 26 mgm%. |
| | COMA I – II. | | 7.38 | 30 | 57 | 93 | | | | |
| 22.10.74 | C.N.S. : NO CHANGE | ORAL NaCl | 7.37 | 27.8 | 52 | 93 | 4.2 | 111 | 70 | |
| 24.10.74 | C.N.S. : NO CHANGE | | 7.33 | 24.5 | 51 | 95 | 4.2 | 110 | 65 | Blood urea 27 mgm %. |
| 26.10.74 | C.N.S. : NO CHANGE | FLUID RESTRICT | 7.38 | 30.9 | 65 | 91.5 | | | | |
| 28.10.74 | C.N.S. : NO SIGNIFICANT CHANGE | | 7.4 | 32.3 | 57 | 91 | 3.8 | 114 | 74 | Urine electrolytes: K 10; Na. 21; Cl. 24. Plasma osmolality: 254 mOsm/L. Urine osmolality: 305 " /L. S.G. of urine: 1.018 |
| 30.10.74 | CONSCOIUS. NO TREMOR OR RIGIDITY. ABLE TO COMPREHEND AND SPEAK FEW WORDS. OLD (L) HEMIPARESES. | | 7.4 | 31 | 63 | 94 | 4.0 | 124 | 73 | |
| 1.11.74 | C.N.S : STABLE MORE DYSNOEIC FEBRILE WITH THICK, YELLOW SPUTUM | | 7.37 | 34 | 74 | 93 | 4.2 | 122 | 85 | Hb: 12.4 gm%. |
| 3.11.74 | C.N.S. : STABLE FURTHER DETERIORATION OF RESPIRATORY STATE | | 7.38 | 28 | 61 | – | 43 | 134 | 75 | Blood urea 52 mgm %. |

NORMAL VALUES IN OUR LABORATORY

BLOOD GASES :

pH: 7.40
$HCO_3$ : 24mM/L
$pCO_2$: 40mmHg
$HbO_2$ 97%

Serum Electrolytes : (mEq/L)
K : 3.4–4.8;
Na: 137 149;
Cl : 95 106;

Urine electrolytes : (mEq/day)
K : 4–42
Na : 10–220
Cl : 200

Plasma osmolality : 280–290 mOsm/L.

## DISCUSSION

The cardinal features of this syndrome are 1) hyponatraemia with corresponding hypoosmalality of the serum and extracellular fluid 2) continued renal excretion of Na 3) absence of clinical evidence of fluid depletion, that is normal skin turgur and B.P. 4) osmolality of the urine greater than that appropriate for the concomitant tonicity of the plasma 5) normal renal and adrenal function (Bartter and Schwartz 1967, Bryant 1972). A low blood urea in the presence of hyponatraemia in an adult strongly suggests the diagnosis of SIADH (Bartter and Schwartz 1967). An undisputable diagnosis can be made upon finding high plasma levels of ADH and the detection of ADH in the urine when the plasma osmolality is below 283 mOsm/Kg. (Miller and Moses 1972).

We were unable to measure ADH levels but our patient had most of the features listed above to meet the diagnosis of inappropriate secretion of ADH. Other causes of hyponatraemia were considered and excluded. Clinically there was no evidence of Addison's disease. He was non-oedematous and there was no evidence of renal, cardiac or hepatic disorder. The skin turger, B.P. and urea was normal thus excluding volume depletion. He had not received any diuretics. Drugs have been known to cause the SIADH (Moses & Miller 1974). But none of the drugs that our patient was on have as yet been implicated in the production of this syndrome.

The clinical features are due to water intoxication and depend upon the severity of the hyponatraemia. The patient is usually asymptomatic when the serum Na is above 120 mEq/L Anorexia, nausea, vomiting and apathy is common when the Na. level is between 110–120 mEq/L. Neurological symptoms and signs such as irritability, confusion, personality changes drowsiness weakness, loss of reflexes, bulbar and pseudo-bulbar palsy, convulsions and coma develop when the Na. levels fall below 110 mEq/L (Bartter and Schwartz 1967, Bryant 1972). Our patient developed tremors of the hands, weakness and rigidity of the upper limbs, confusion, stupor and finally lapsed into coma when the Na. levels were about 111 mEq/L. Hypoxia and $CO_2$ retention could have been partly responsible for some of the neurological signs but it is unlikely, since appropriate correction of the blood gases did not alter the neurological state where as fluid restriction resulted in fairly rapid improvement of the hyponatraemia and the clinical picture.

Our patient had respiratory and neurological abnormalities to begin with and any of these could have been responsible for the inappropriate secretion. His mild stroke was of 9 years duration and on the present admission there was no clinical evidence of progression of the stroke. So it is unlikely to be the causative factor. Similarly chronic obstructive airways disease is unlikely to be responsible since over the years that he had had this no symptoms or signs of inappropriate secretion of ADH had developed. Whether chest infection or respiratory failure or a combination of both was responsible is hard to say.

The mechanism and the site of ADH productive is in nuclear.

The management of these patients is to treat the underlying abnormality and correct the hyponatraemia. Sometimes spontaneous resolution of the primary disorder or effective treatment of the infection will be followed by the disappearance of the SIADH (Bartter and Schwartz 1967, Bryant 1972, Spanos and Spry 1974). Ordinarily fluid restriction will result in improvement in practically all the cases (Bartter and Schwartz 1967). In patients with obstructive airways disease fluid restriction can be dangerous (Bryant 1972) since this can lead to the formation of thick, tenacious sputum with resultant further deterioration of the respiratory state as probably happened in the case of our patient even though the fluid restriction was very minimal. Hypertonic saline solution may be used on a short term basis when there are severe signs of water intoxication (Bartter and Schwartz 1967). Oral salt is ineffective. Large doses of Na. retaining steroids will usually induce a positive balance of Na. but they perse do not represent a treatment of SIADH because they do not affect the underlying problem of over-hydration and because of the potentially harmful complications of the prolonged use of these agents (Bartter and Schwartz 1967).

## SUMMARY

A case of inappropriate secretion of antidiuretic hormone in chronic obstructive airways disease with chest infection and respiratory failure is described. The syndrome of inappropriate secretion of antidiuretic hormone (SIADH) in pulmonary diseases is briefly reviewed.

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# Histoplasmosis: Long term remission following treatment with low dose amphotericin-B

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## SUMMARY

Three patients with oro-pharyngeal histoplasmosis and systemic involvement were treated with a minimal total amount of Amphotericin-B administered intermittently in low dosage because of serious toxic reactions. The drug was given in 10 – 25 mg doses approximately 2 – 3 times a week and total amounts administered varied between 130 mg and 500 mg over 6 to 15 weeks. All patients responded to treatment and healing of lesions was observed several weeks after cessation of therapy. It is suggested that such minimal doses of Amphotericin-B may suffice in treatment of patients with invasive histoplasmosis especially when serious toxic reactions are encountered.

## INTRODUCTION

Amphotericin-B in maximum tolerated doses is generally accepted as appropriate therapy for systemic histoplasmosis. This current practice is not entirely satisfactory because such high doses of Amphotericin-B frequently produces serious toxic reactions and requires prolonged hospitalisation. Information concerning a minimal effective dose must be determined by appropriate observations in man, because data on the pharmocology of Amphotericin-B do not at the present time suffice for defining a rational dosage scheme.

Generally a cumulative dose of at least 3 gms of Amphotericin-B is recommended as minimum treatment for most patients with invasive mycoses such as sytemic histoplasmosis. However referrals to the literature has not clarified the basis for this commonly accepted scheme of therapy.

In this paper we present 3 patients with oropharyngeal histoplasmosis with systemic involvement, all of whom were positively diagnosed on the basis of both histopathology and culture studies and who were treated with a very much lower dosage of Amphotericin-B than recommended. We report long term remissions in these patients and would suggest that the administration of Amphotericin-B be deliberately reviewed in the light of our findings.

## CASE REPORT

*CASE 1* L.Y. was a male Chinese patient aged 54 years from Puchong. He worked as a motor mechanic and had been in this occupation for the last 30 years. He was first seen at the General Hospital, Kuala Lumpur in March 1972 complain-

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ing of weight loss generalised weakness and easy fatigability for a period of about 6 months. He had lost about 35 lbs and weighed 102 lbs when seen. A month before admission he had developed painful oral ulcers and nodules which made it difficult for him to swallow. He had no past medical history of significance.

On examination he appeared ill, his blood pressure was 110/70, and he had several ulcers and nodules within his oral cavity, (Fig 1 and 2).

Investigations revealed haemoglobin 14.2 gm/100 ml, total white count 15,800 (P=784, L=184, B=2%), platelets counts 320,000/cu mm, blood urea 31 mg%, Serum Na 140 meg/L, Potassium 4.0 meg/L, Chlorides 102 meg/L, urinalysis negative for sugar and albumen, no urinary deposits, serum bilirubin 0.8 mg%, serum alkaline phosphatase 28 KA Units, Serum albumen 3.2 gm/100 ml, serum globulin 3.8 gm/100 ml, serum gultanic oxalate transaminase 87 I.U. sputum negative for acid fast organisms, chest and abdominal x-rays negative, plasma cortisol 14 micrograms/100 ml (following Synacthen stimulation-22 micrograms/100 ml). Histoplasmosis was diagnosed both by identification in histopatho - logical sections taken from oral nodules (Fig 3) as well as by culture in sputum and bone marrow.

Treatment with Amphotericin-B was initially started at a dose of 20 mg per 500 mls of 5% Dextrose. However this dosage had to be reduced because of severe neuritic pains the patient developed in his ulna and popliteal nerves which appeared to be dose related. Over a period of 15 weeks a total of 410 mg of Amphotericin-B was infused at approximately 10 mg thrice weekly. This treatment had then to be discontinued because nerve pains became intolerable and a wrist drop developed in his right hand. Concomitant use of steriods was helpful but did not completely relieve the symptoms. At the time of discontinuation of therapy there was some improvement seen in the oral ulcers but these had not completely disappeared. Blood and sputum cultures became negative four weeks after commencement of therapy. He was followed up subsequently and it was observed that these ulcers and nodules progressively disappeared over a period of 6 to 8 months (Fig 4). During this time he reported increased well-being and a return of appetite. His weight increased from 102 lbs over the next year to around 140 lbs. Neuritic pains however continued to occur for several months after healing of oral ulcers. He was last reviewed in May this year at which time he appeared to be well and had no symptoms-24 months after cessation of therapy.

*CASE 2* This was a 53 year old male, Indian hospital assistant A.P., who was referred to our care in May, 1972. He had developed prolonged fever for more than three months and had been treated with a variety of antibiotics without very much relief. He also complained of increasing weakness and loss of weight. About one month earlier he was given a course of Prednisolone which resulted in the fever subsiding but symptoms recurred on stopping the medication. On examination in Kuala Lumpur he was found to be febrile and slightly jaundiced. The liver was enlarged to 4 cm below the costal margin and was slightly tender. The left tonsil was noted to be larger than the right and covered with a whitish exudate. No neck glands were felt. Haemoglobin, full blood counts, urinalysis, blood urea, serum electrolytes, serum creatinine, serum proteins, ECG, chest x-rays were all normal. Sputum was negative for acid-fast organisms. Serum Bilirubin was 1.8 mg%, alkaline phosphatase 28 KA Units and SGPT 120 I.U. Biopsy of the tonsil which was removed showed the presence of Histoplasma Capsulation. Subsequently positive cultures from the tonsil also confirned the diagnosis. Sputum urine and blood did not yield positive cultures. He was treated with Amphotericin-B with few side effects and there was good patient acceptability at 25 mg infusion dose. The drug was given as a slow intravenous infusion in 500 ml of 5% Dextrose at 25 mg thrice weekly and treatment was discontinued after infusion of a total dose of 500 mg or Amphotericin-B over a period of 10 weeks. The patient became afebrile in one week and has been well for the past 18 months.

CASE 3 Mr. N.H., a 61 year old Malay Mining Engineer from Burma came to us early this year. He complained of extreme loss of weight (more than 48 lbs) and felt weak, tired easily and had severe anorexia. He had developed ulcers in the right mandibular sulcus region, over the previous 2 to 3 months and had attributed this to an abrasion from his dentures. He had seen several doctors both in Burma and in Kuala Lumpur and had been given various types of treatment the nature of which was not known. When seen, he weighed 101 lb and appeared very weak and emaciated. His blood pressure was 90/50 and he had mild oedema of his ankles. Investigations revealed abnormal chest x-ray

showing diffuse mottling (compatible with pulmonary histoplasmosis), abnormal liver function test (SGPT 88 I.U. and serum albumin 2.4 gm) and adrenal insufficiency (basal levels of plasmocortisol 6.3 micrograms and after Synecthen stimulation, 6.7 micrograms). Histoplasmosis was confirmed from biopsy of the oral ulcer and culture of sputum urine and blood. He was started on Amphotericin-B at 10 mg dose levels and increased to 25 mg daily but this dose had to be reduced because of runs of ventricular ectopics, transient heart blocks, hypotension and axotaemia. Treatment with Amphotericin-B was continued at approximately 15 mg twice weekly over a period of six weeks during which time 125 mg of the drug was given. Subsequent administrations caused severe rigors and haematuria even though an attempt was made to reduce the dosage. The units of 5% Dextrose used were analysed at 3 different independent laboratories in Kuala Lumpur and Germany and were reported to be both bacteria and pyrogen free. A further 15 mg of the drug were given in 5% Dextrose after a short pause but the patient again developed severe rigors and complained of oppresive chest pains. ECG's taken at this point showed that he had developed an acute myocardial infarction. Amphotericin-B was discontinued on the basis that further infusions appeared to carry a real risk of serious myocardial and renal damage. The patient meanwhile was given tablets of Cortisone Acetate and intermittent injections of "Synecthen retard".

On follow-up he showed increased well-being with a return of appetite. His weight increased from 101 lbs to 120 lbs when last seen about a month ago. Cultures of urine became negative 3 weeks after treatment and continue to be negative. All ulcers showed progressive healing after cessation of therapy. He remains well 5 months after Amphothericin-B was discontinued.

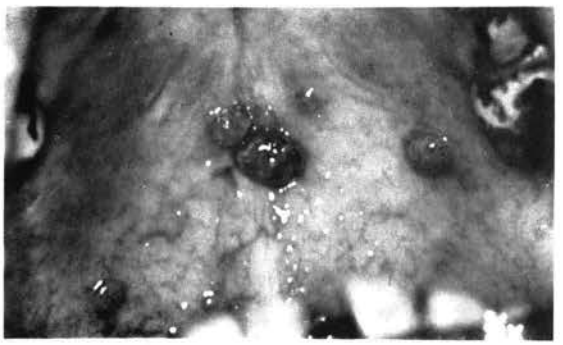
## DISCUSSION

It is generally agreed that spontaneous recovery from invasive histoplasmosis occurs uncommonly (Furcolow M.L. et. al. 1963). However there has been no agreement on the minimum dose of Amphotericin-B required to treat such patients both effectively and safely (Sutliff D.W. 1972). Previous observations that doses below 1 mg/kg/day (Andiole V.T. et. al. 1962) are ineffective are not generally accepted (Drutz D.J. et. al. 1968 and Sutliff D.W. 1972). Thus far determation of daily dosage and duration of treatment appears to be based on the limits of toxicity that the patient can accept and the primary goal has been to stay as close as possible to maximally tolerated doses.

In the case of Amphotericin-B a full understanding of its pharmocology and structure and fate within the body have not been clearly elucidated. Its mechanism of action has been described as a reaction with lipid components of cell walls and lysosomal membrane but quantitative interpretation of these reactions and the degree to which these affect host tissues have not been clearly defined. The question of dosage therefore of Amphotericin-B will continue to rely on clinical experience derived from patient treatment. It is possible that in an indolent infection such as histoplasmosis host-parasite relationships could be altered in favour of defence mechanisms with a minimal dose of the antifungal drug. What the exact mechanism of body defences against low grade infections of this type has not been clear from previous studies.

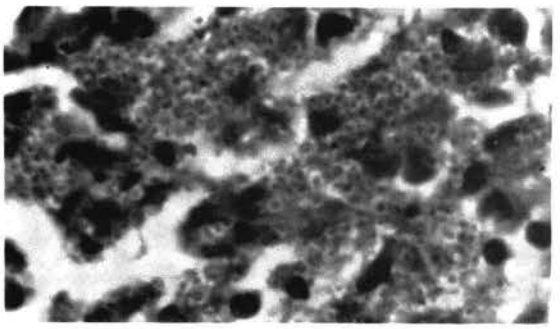
It has been suggested that a dose of 50 mg of Amphotericin-B given thrice weekly over 17 weeks appeared to control most patients with prodominant chronic pulmonary histoplasmosis (Sutliff D.W. 1972). On this study it was recommended that this type of smaller total dosage with retreatment when necessary appeared to be a logical procedure considering the serious side effects with the use of the drug. Even at these doses it is conceded that toxic effects in patients appear to be significant.

In our series, serious side effects forced us to use much lower doses during each infusion in the treatment of our patients. Further, marked toxicity also prevented administration of a planned cumulative dose which would appear to be optimal by previous recommendations. We have been impressed by the fact that continued patient well-being and resolution of tissue involvement has occured on these doses long after the drug has been discontinued. It would appear that response to treatment would continue after drug administration has ceased. In one of our patients (Case 2) we deliberately used smaller daily doses in spite of greater patient tolerance and observed similar long lasting improvement. In another patient (Case 3) there was laboratory and clinical evidence of adrenal insufficiency and though such patients are regarded as being seriously ill with a high mortality rate (Sarosi, G.A. et. al. 1971), this patient has shown surprisingly good recovery. We do not discount the possibility that retreatment in our patients may be necessary at a



*Shows nodules on the palate.*
*Fig. 1*

*Shows a chronic ulcer on the left margin of tongue.* *Fig. 2*



*Photomicrograph shows Histoplasma Capsulatum in a biopsy taken from the tongue ulcer. (Orig. mag x 120/PAS stain).*
*Fig. 3*

*Shows regression of nodules on the palate, (Compare Fig 1).*
*Fig. 4*

later date. However the desired response coupled with increased patient safety prompts us to recommend lower doses of Amphotericin-B in patients with disseminated histoplasmosis.

Admittedly this series is uncontrolled and too small for firm conclusions regarding Amphotericin-B dosage to be generally applied for treatment of patients with invasive histoplasmosis. However we conclude that these observations do suggest that a much lower cumulative dose of Amphotericin-B administered in lower intermittent doses for patients with the disease may suffice and is worthwhile considering in those who develop serious side effects during therapy.

## ADDENDUM

Since submission of this manuscript for publication two of our patients have had clinical signs of relapse. Although cultures of body fluids have been negative we have proceeded with re-treatment using minimal doses as indicated in this publication.

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# Partial Exchange transfusion in the treatment of severe anaemia in late pregnancy

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In Malaysia and Singapore, anaemia in pregnancy is common with reported incidences up to 25 to 30% (2,4). This is mainly of the iron-deficiency type secondary to nutritional causes. Such cases may be treated with oral or intramuscular iron, total dose infusion of Imferon or blood transfusion depending on the severity of anaemia. Most of the cases we see are mild to moderate in intensity. Severe anaemia (haemoglobin less than 6.5 g%) fortunately is uncommon, the incidences ranging from 1.5 to 3.1% (3, 4, 6).

This is in contrast to the very severe anaemias in pregnancy seen in the African continent where patients may present with haemoglobins (Hb) of less than 4.0 g% or hematocrits (PCV) of less than 13.0%. In such patients, maternal mortality directly related to the anaemia is high, being 20.0% in those without heart failure and 55.0% in those with associated heart failure (1). In the circumstance, conventional methods of treatment are ineffective and may even be dangerous especially during late pregnancy or in labour. To combat this disadvantage, Fullerton and Turner (1962) (1) and Philpott et al (1966) (5) have employed the technique of partial exchange transfusion with great success in such patients in Africa.

In this paper, we describe a case of severe anaemia in late pregnancy presenting with heart failure in whom partial exchange transfusion brought about a dramatic response.

## CASE REPORT

A 29 year old gravida 5, para 4 was admitted on 5.11.1974 at 37 weeks gestation with severe anaemia and heart failure. She had marked conjunctival pallor, ankle and sacral oedema, sinus tachycardia of 120/min. a raised jugular venous pressure of 4 cm. (JVP), hepatomegaly of 2 cm., and bilateral basal crepitations in the lungs. She was dyspnoeic and orthopnoeic. There was no clinical evidence of any organic heart lesion. The uterine fundus was 38 weeks in size with the foetus in cephalic presentation.

The haemoglobin was 3.0 g% and the PCV was 10.0%. The mean corpuscular haemoglobin concentration (MCHC) was 30.0%.

Management consisted initially of intravenous lasix and rapid digitalisation. In view of the acuteness of the problem, it was decided to carry out *partial exchange transfusion.*

### Procedure

About 200 ml. of blood was initially withdrawn from the left cubital vein. As 900 ml. of packed cells was transfused via the right cubital vein, 1200 ml. of blood was withdrawn from the left cubital vein of the patient into 3 blood bags. No vacuum pumps were necessary.

The patient's blood pressure and pulse were monitored every 15 minutes. The whole procedure took 2 hours. A final deficit of 500 ml. of blood was achieved.

Response

The following chart shows the response of the patient 4 hours and 24 hours following exchange transfusion:–

| | Before Transfusion | 4 hours after Transfusion | 24 hours after Transfusion |
|---|---|---|---|
| Hb (g%) | 3.0 | 5.5 | – |
| PCV (%) | 10.0 | 26.0 | – |
| JVP | 4 cm | 2 cm | 2 cm |
| Blood Pressure | 140/90 mm Hg | 140/85 mm.Hg | 140/100 mm.Hg |
| Maternal Pulse | 120/min. | 104/min. | 88/min. |
| Lung signs | Bilateral basal crepitations | crepitations left base | occassional crepitations left base |
| Symptomatology | Dyspnoea + orthopnoea | No symptoms | No symptoms |

As can be seen, there was considerable improvement in the haemoglobin and PCV levels and marked resolution of cardio - respiratory signs. The patient was out of failure within a short duration.

Other investigations included a chest X-ray, blood urea, serum electrolytes and electrocardiogram, all of which were normal. Peripheral blood film showed moderate microcytosis with hypochromia, anisocytosis, poikilocytosis and mild macrocytosis. The diagnosis of iron - deficiency anaemia was made. Stools for ova and cysts showed presence of ascaris but absence of hookworm. Serum proteins included a low albumin of 2.9 g% and globulins of 3.6 g%.

On the 20.11.1974, at 39 weeks, she was induced by forewater amniotomy and oxytocin drip for toxaemia of pregnancy. She had a normal delivery of a live male baby of 2340 g Blood loss at delivery was estimated at 150 ml. Syntometrine 1 ml. was given intramuscularly at crowning. She did not develop heart failure during labour.

She had a bilateral tubal ligation done on 25.11.1974 and was discharged well with her baby on 28.11.1974. Her post-partum haemoglobin was 9.5 g%.

## DISCUSSION

According to Fullerton and Turner (1962) (1) and Philpott et al (1966) (5), the criteria for exchange transfusion in pregnancy are either a haemoglobin of less than 4.4 g% or a PCV of less than 13.0%. Following the introduction of exchange transfusion in their patients, Fullerton and Turner noted a dramatic reduction in maternal mortality due to severe anaemia from 20.0% to 2.8% in patients without heart failure and from 55.0% to 3.6% in patients with heart failure.

The main advantage is that this method enables the haemoglobin level and red cell mass to be raised without at the same time augmenting the blood volume. Ordinary blood transfusion results in an increase in blood volume and might be lethal in patients with heart failure. If the patient is not in failure, this might be induced by the transfusion (1).

Moreover, Philpott et al (1966) (5) noted that the rise in haemoglobin and PCV levels could be achieved in 4 hours with partial exchange transfusion what would take 3 days with the conventional method. The mean increase in these values were also higher following partial exchange transfusion.

The above authors (1,5) transfuse between 1000 to 1500 ml. packed cells via the right cubital vein aided by a Martin's pump and withdraw between 1100 to 1700 ml blood from the left femoral vein aided by a vacuum pump. The whole procedure takes on an average 20 to 26 minutes. The blood withdrawn is packed and given back to the patient later. In our patient, we did not re-transfuse the blood withdrawn on the advice of the Blood Bank

unit that there was considerable haemolysis of the red cells.

We believe that this technique of partial exchange transfusion has a place to play in the treatment of severe anaemia in pregnancy especially in late pregnancy or in labour and more so in those patients with heart failure.

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# Treatment of tubal occlusion by hydrotubation*

by

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Fallopian tube occlusion as a cause of infertility accounts for 25 to 30 percent of patients attending an infertility clinic. In the past surgical operative methods have been the line of treatment for fallopian tube occlusion, but the statistical data for surgery have not been reassuring or encouraging. Surgical reconstruction of fimbrial end tubal occulsion offered about 1 to 2 percent chance of conception. But recently treatment of tubal occlusion by hydrotubation gave a 20 percent chance of conception (1,2)

*METHOD AND MATERIALS.*

The above study was carried out at the Department of Obstetrics and Gynaecology General Hospital, Malacca from August 1973 to May 1974. The patients for the study were selected from the infertility clinic, where the patients were previously investigated for the following.

(a) Examination under anaesthesia for genital tract abnormality.
(b) Uterine size and uterine sound measurent for length of uterine cavity.
(c) Diagnostic curettage for histology regarding ovulation.
(d) Tubal insufflation for tubal patency.
(e) Husbands semen analysis.

In this study only patients with tubal occlusion were selected for hydrotubation.

The technique of hydrotubation was very similar to that of Hysterosalpingogram but here the procedure was carried out as an out-patient in the Gynaecology clinic. The procedure was an outpatient procedure and no preparation was required and no pre or post procedure sedation was used. The patient was placed in the dorsal position and after cleaning the vulva with 5% Dettol or Hibitane solution, a cusco's bivalve speculum was introduced and the cervix visualised, and held by a Vollsellum. A Leech Willkinson cannula was introduced into the cervix and the solution in a 20 cc syringe was slowly injected into the uterine cavity. The solution was a mixture of 20 cc distilled water, 1 gram streptomycin, 25 to 100 mgm Hydrocotisone and 1 mega Crystatline Penicillin. During the procedure, pain, resistance and spill of the solution were noted and recorded. After the hydrotubation the patient immediately went home. The Hydrotubation was carried out at weekly intervals.

STATISTICAL DATA

The data on the above study has been tabulated as follows:

Table I showed that the majority of patients were in the age group 25 to 29 years.

Table II showed for the Malays and Indians the number of cases for Primary and secondary infertility were equal but for the Chinese there were

* Paper presented at the 9th Malaysia - Singapore Congress of Academy of Medicine in September 1974, Kuala Lumpur.

Table I. Ethenic Group / Age

| Ethenic Group | 20–24 | 25–29 | 30–34 | 35–39 | 40. |
|---|---|---|---|---|---|
| Malays | 3 | 5 | 2 | 1 | 1 |
| Chinese | 2 | 17 | 7 | 6 | 0 |
| Indians | 2 | 4 | 0 | 0 | 0 |
| | 7 | 26 | 9 | 7 | 1 |

Table II. Ethenic Group / Primary or Secondary Infertility.

| Ethenic Group | Primary Infertility | Secondary Infertility |
|---|---|---|
| Malays | 6 | 6 |
| Chinese | 23 | 9 |
| Indians | 3 | 3 |
| | 32 | 18 |

Table III. Ethenic group / Number of years married or number of years since last pregnancy.

| Ethenic Group | No of years married or number of years since last pregnancy. | | | | | |
|---|---|---|---|---|---|---|
| | 0 – 2 | 2 – 4 | 4 – 6 | 6 – 8 | 8 – 10 | 10 + |
| Malays | 0 | 4 | 2 | 3 | 3 | 0 |
| Chinese | 0 | 16 | 5 | 4 | 3 | 4 |
| Indian | 0 | 2 | 2 | 1 | 1 | 0 |
| | 0 | 22 | 9 | 8 | 7 | 4 |

Table IV. Ethemic group / Diagnostic D & C / Examination under anaesthesia.

| Ethenic Group | Endomatral curettage for Histology | | Uterine size | |
|---|---|---|---|---|
| | Secretory | Non-secretory | Normal | Hypoplastic |
| Malays | 11 | 1 | 11 | 1 |
| Chinese | 25 | 7 | 27 | 5 |
| Indians | 5 | 1 | 5 | 1 |
| | 41 | 9 | 43 | 7 |

more primary infertility cases, and giving a higher number of primary infertility cases in this study, 32 primary infertility and 18 secondary infertility cases.

Table III showed that the majority were in the group 2 to 4 years of marriage or last pregnancy 2 to 4 years before they were investigated for this study.

Table IV showed the results of examination under anaesthesia and Diagnostic currettage and 41 cases showed histological evidence of ovulation and 9 cases showed non ovulatory cycles. At the time of the Diagnostic D & C the uterine cavity was measured and the uterus was classified as hypoplastic if the cavity was less than 2" by the uterine sound.

In table IV, 7 of the cases had small or Hypoplastic uterus. Patients with non ovulation were treated for induction ovulation by Chlomephene Citrate and patients with hypoplastic uterus were given Cyclical hormones.

Table V showed the results of Tubal insufflation and 38 patients had blocked tubes, and 12 with tubal spasm.

Table VI showed that only 2 patients had no sperm motility and another two had 1 to 25 percent motility. Regarding spermatozoa count only 9 patients had sperm count of less than 25 million per ml. It has been shown that if the sperm count is less than 25 millions per ml then the man is likely to be relatively sub-fertile.

Table V. Ethenic Group /Tubal Insufflation.

| Ethenic Group | Tubal Insufflation: Spasm $Co_2$ Passed 100 – 150 | 150 – 200 | Blocked Tubes |
|---|---|---|---|
| Malays | 2 | 2 | 8 |
| Chinese | 6 | 2 | 24 |
| Indians | 0 | 0 | 6 |
| | 8 | 4 | 38 |

Table VI. Ethenic Groups / Husbands semen analysis.

| Ethenic Group | Motility 0 | 1–25% | 25–50 | 50–75 | 75–100 | Counts in millions / per ml. Azospermia | 1–25 | 25–50 | 50–100 | 100 + |
|---|---|---|---|---|---|---|---|---|---|---|
| Malays | 0 | 2 | 2 | 4 | 4 | 0 | 3 | 3 | 3 | 3 |
| Chinese | 2 | 0 | 11 | 12 | 7 | 2 | 3 | 9 | 12 | 6 |
| Indians | 0 | 0 | 3 | 2 | 1 | 0 | 1 | 3 | 1 | 1 |
| | 2 | 2 | 16 | 18 | 12 | 2 | 7 | 17 | 16 | 10 |

Table VII. Ethenic Group / Tubal Insufflation / Hydrotubation.

| Tubal Insufflation | Number of Hydrotubations. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Spasm: | | | | | | | | | | | |
| 100–150 | 0 | 0 | 1 | 1 | 4 | 0 | 0 | 1 | 0 | 1 | 8 (IP) |
| 150–200 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| Blocked Tubes | 0 | 2 | 3 | 8 | 7 | 3 | 6 | 7 | 1 | 1 | 38 (IOP) |
| Number of Hydrotubation | 0 | 2 | 4 | 9 | 12 | 4 | 6 | 9 | 1 | 3 | |
| Number of Pregnancies | 0 | (1P) | (2P) | (3P) | (3P) | (1P) | (1P) | 0 | 0 | 0 | |

Table VIII. Details of patients who became pregnant.

| No. Ethenic | Age | Years Married | Last Pregnancy in years | Ovulation | Semen Analysis Motility | Count | Tubal Insufflation | Number of Hydrotubation |
|---|---|---|---|---|---|---|---|---|
| 1. Malay | 29 | 6 | 4 | Yes | 65% | 80 million | Block | 6 |
| 2. Chinese | 27 | 4 | 2 | Yes | 80% | 70 " | Blocked | 7 |
| 3. Chinese | 27 | 3 | – | Yes | 80% | 57 " | 100 | 3 |
| 4. Chinese | 28 | 5 | – | Yes | 60% | 60 " | Blocked | 5 |
| 5. Chinese | 31 | 4 | – | Yes | 60% | 60 " | Blocked | 5 |
| 6. Malay | 28 | 7 | 5 | Yes | 80% | 200 " | Blocked | 4 |
| 7. Indian | 27 | 5 | 4 | Yes | 80% | 180 " | Blocked | 2 |
| 8. Chinese | 20 | 2 | – | Yes | 80% | 160 " | Blocked | 3 |
| 9. Chinese | 26 | 3 | – | Yes | 65% | 50 " | Blocked | 5 |
| 10. Chinese | 23 | 3 | – | Yes | 35% | 65 " | Blocked | 4 |
| 11. Chinese | 31 | 2 | – | Yes | 80% | 200 " | Blocked | 5 |

Table VII showed the number of Hydrotubation's done and this was compared in the two groups, namely patients with tubal spasm of 100 to 200 and patients with completely blocked tubes and the number of patients who later became pregnant; of the 50 cases, 11 patients became pregnant, giving a success rate of 22 percent. But if the pregnancy rates were worked out for the two groups, in the tubal spasm group there was 1 pregnancy in 12 cases giving a pregnancy success rate of 8.5 percent, but in Blocked tubes group there was 10 pregnancies in 38 cases, giving a pregnancy success rate of 26.3 percent.

Table VIII showed the details of the patients who became pregnant after the hydrotubation.

(a) Ethnic groups, 2 Malays, 8 Chinese, 1 Indian.
(b) Age: the majority were 25 to 29 years.
(c) Duration of marriage, the majority were 2 to 4 years married
(d) Primarity infertility 7 cases, secondary infertility 4 cases.
(e) All cases showed ovulation.
(f) All sperm counts were above 50 million per ml and sperm motility above 80 percent.
(g) The optimum number of Hydrotubation was 4 to 5.

COMMENTS:–

Fallopian tube occlusion as a cause of infertility accounts for 25 to 30 percent in infertility clinics. With a case of tubal occlusion the Gynaecologist is faced with three alternatives.

1. The first alternative is to explain to the patient that her fallopian tubes are blocked and she would require antibiotic therapy and follow up. The patient is reassured and told to wait patiently and hope that the occlusion clears up on its own.

2. The second alternative is surgical operative methods. At laparatomy the Gynaecologist has 3 possible operative procedures to choose namely Salpingolysis, Salpingostomy of tubo-uterine implantation. Salpingolysis involves the separation of peritubal and periovarian adhesions, and is similar to hydrotubation, but in salpingolysis the disadvantage is that the patient would require a laparotomy. The reported subsequent pregnancy rate is about 10 to 40 percent.

In Salpingostomy, the creation of a new stoma in the outer end of a completely closed tube.

(a) the edge of a new stoma can be rolled back to form a culf.
(b) the tube is opened longitudially throughout its length - gutter salpingostomy and suture the edges carefully.

The success rate varies from 1 to 10 percent.

In tubo-uterine implantation, excision of a damaged isthmus with implantation of the remaining healthy part of the tube is followed by pregnancy success rates from 0 to 20 percent.

The low rate of success in tuboplastic surgery is mainly due to damaged tubal epithelium and muscular layer, there is little to be expected from procedures employing artifical or substitute oviducts (3) The main task is still prevention of ascending and post operative inflammation in the pelvis and adhesions in cases requiring pelvic surgery.

3. The third alternative is hydrotubation and hydrotubation may open the occluded fallopian tube (1,2). The procedure is a simple, out patient procedure, readily accepted by the patients as it invloves no anaesthesia or surgery, the equipment and drugs required is readily available in all hospitals, thus minimising the hospital cost for such procedures, and finally it is an effective procedure as repeated hydrotubation reestablishes the patency of the Fallopian tube.

CONCLUSION:

The above prospective study of hydrotubation is cases of fallopian tube occlusion gave a pregnancy success rate of 22 percent, which is consistent with the rates of other studies.

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## BOOK REVIEWS

### HUMAN RIGHTS IN HEALTH. Ciba Foundation Symposium 23. 1974 Associated Scientific Publishers, Amsterdam p.p. VIII & 304

No less than twenty-eight authorities have contributed to this symposium held at the Ciba Foundation in London in 1973, the year of the 25th Anniversary of the Declaration of Human Rights and the 25th birthday of the World Health Organisation.

The organisers of the symposium have chosen four fundamental human rights on health as the minimum at which mankind should aim, namely, safe water to drink, sufficient food, protection against communicable disease, and access to the means of controlling fertility. The contributors try to explore the practical implications of adopting these four determinants of health as universal human rights in terms of funding, human and material resources, and management needs.

The authors and those that took part in the discussions have attempted to estimate the necessary costs and social changes and the effects on world development of converting these rights into realities. It is a publication that well merits the study by all health workers and sociologists of developing countries.

### HEALTH OF THE PEOPLE. WHO Publication, Geneva, 1975 Edited by Kenneth W, Newman pp. 206 Sw. Fr. 36

'Health of the People' consists of ten chapters describing innovative methods of delivering primary health care to the populations, particularly rural areas, involving community action and participation.

One chapter describes the approach taken in India in integrating a traditional system of medicine, the Ayewedic system, into the health services as a whole.

The other chapters fall into three groups dealing with countries where there were far-reaching changes at the national level (China, Cuba, Tanzania), those where there was an extension of the existing system (Iran, Niger, Venezuela), and those where there was community development in a limited local area (Guatemala India, Indonesia).

Because of the methods used and the results obtained, the systems described have important implications for the organisation of health services in many countries, both developing and developed.

This book should be read not only by health workers of all kinds but also by politicians and administrators concerned with setting up, extending or running health services.

### THE WORK OF W.H.O. 1974 W.H.O. Publication, Geneva 1975. p.p. XVIII & 343 S.w. Fr. 18

This is the Annual Report of the Director General Dr. Halfdan Mahler to the World Health Assembly and to the United Nations.

In his opening paragraph he notes that the cutback in public spending in many countries as a result of economic instability threatens far-reaching consequences for the social services, not least for those concerned with health. W.H.O. and other international organisations have likewise been faced by reduced spending power, which has obliged them to look more closely than ever at their traditional programmes and to think more imaginatively about their future possibilities.

Owing to the perennial lack of trained manpower throughout the world W.H.O. has begun to formulate proposals for the training of village health workers who will be in direct contact with the rural population they are expected to serve.

The report concedes that the general situation of malaria has deteriorated, the disease now raging in some countries where its eradication seemed imminent a few years ago. The world situation in regard to smallpox, certain communicable diseases like poliomyelitis, syphilis and gonorrhoea, and non communicable diseases like cancer, diabetes and connective tissue affections are reviewed. W.H.O. has given help to some 60 countries as part of its family health programme to include maternal and child health, nutrition, family planning and the psychosocial health of the family.

This comprehensive report includes a general review as well as particular problems in each of the six WHO Regions.