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CONTENTS

Editorial:

The case for a unified organisation for post-graduate medical education

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The rapid expansion of the Medical and Health services in the country with the aim of Government in the Third Malaysia Plan to make available these services to the rural areas, will impose an increasing demand on the medical profession to provide the highest possible quality of medical care for our people. It is vital that the standard of medical care in the ultimate analysis be best safeguard by the professionals themselves. This is particularly true in the field of postgraduate medical education and accreditation.

The public at large in our country is becoming increasingly aware of the need for good and, wherever possible, specialised medical care in the various disciplines. So far, Colleges in the United Kingdom and Australia and the Specialist Boards in the United States of America have helped us to conduct the necessary examinations in order that these standards are maintained. But the time is more than ripe for us to make available to our doctors a system of training and examinations locally, and to have a professional body which could conduct such examinations, in the initial period with the help of our sister Colleges abroad, and grant local diplomas which would be of international standing. This would enable us to provide the up-and-coming doctors in the country with an avenue to plan their future postgraduate training programmes without uncertainty or frustration. Such a programme will also help the country attain the required quota of specialists within at least the next decade. Under no circumstances, should the standard for training and accreditation be compromised; experience in some of the developing countries has shown that once the standards are compromised it is almost impossible to regain the standards or gain confidence for such degrees or diplomas. Because overseas institutions in the United Kingdom. Australia and in the United Stated have never allowed their standards or their requirements to be compromised, their diplomas are still much coveted and respected.

The Board of Postgraduate Medical Education in the University of Malaya runs courses for the diplomas in Public Health, Pathology and Psychological Medicine and has successfully conducted courses and held local examinations for the first part in Medicine and in some cases for the first and second parts in surgery of Colleges in the Commonwealth. With the establishment of the University of Kebangsaan, it will be possible in future to utilise not only the facilities of the Medical Faculty of the University of Malaya, but also the facilities and staff of the University of Kebangsaan and the specialists in Government service and the private sector to conduct the courses locally. What is required, however, is a unifying body, which could gather under its wing all the major specialities either as Colleges or as Faculties to draw up the necessary syllabuses and requirements and at the same time conduct examinations and grant diplomas in the various specialities.

For historical reason in the United Kingdom, respective Colleges were formed in the various specialities. One estimate has it that there are 107 postgraduate diplomas in the United Kingdom and at a conference in Glasgow in 1967, "multiple diplomatosis" was diagnosed as one of the problems facing postgraduate qualifications in the United Kingdom. Several Royal Commissions and Committees have been appointed on Medical Education, the most recent one being the Committee of Inquiry into the Regulations of the Medical Profession under the chairmanship of Dr. A.W. Merrison, F.R.S. in 1975. This is known as the Merrison Report. In

order that the many specialised organisations could be unified, a Joint Consultants' Committee was formed in the United Kingdom as "it was essential in the interest of Consultants that a joint committee of bodies concerned should be established to speak for consultants with one voice".

Recently, at the 10th Singapore Malaysia Congress of Medicine in Singapore, Mr. James Ross, President of the Royal College of Surgeons of Edinburgh and Mr. R.B. Wright, former President of the Royal College of Physicians and Surgeons of Glasgow emphasised the fact that it would be better, following their experiences in England to bring the various specialities under one organisation. They said that what may be lost by individuality of the specialities is more than gained by unity of the specialist groups which can talk with one voice and endeavour to maintain a uniform standard.

In Canada they have a College known as the College of Physicians and Surgeons of Canada and examinations in the various specialities are conducted by this College. In South Africa the Colleges which were initially formed as the College of Physicians and Surgeons in 1926 and the College of Gynaecologists in 1971, have recently been combined and called the "College of Medicine of South Africa". This College has all the specialities under its fold and it even includes general practice as one of its specialities in which it conducts its examinations.

In Malaysia over the past several years attempts have been made to establish the College of Surgeons, the College of General Practitioners and the College of Physicians and draft a Bill for the Registration of these Colleges to be put through Parliament. The Bill as it was planned was circulated to the respective organisations and we understand that it has not been found generally acceptable either to the College of General Practitioners or the College of Physicians. Even amongst the Surgeons and the Anaesthetists, there is said to be a division of opinion with regard to this proposed Act.

Under the circumstances, it is felt that the time is opportune to bring about cohesion in the profession as a whole and it is suggested that a National body be now established by Act of Parliament with powers and facilities to organize and conduct courses and examinations for various post-graduate diplomas utilizing the resources of the Universities, Hospitals and Medical Organizations in the country.

A survey of ward behaviour of long stay Psychiatric patients

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This survey was done in Hospital Bahagia, a custodial institution for the mentally ill in West Malaysia. Built in 1910, the hospital now serves a catchment area of 16,360 sq. miles with a population of over 5 million (Annual General Report, Hospital Bahagia, 1971).

At the time of study, there were about 4000 inpatients, 1740 of whom were designated as longstay and nursed in a separate section of the hospital – equivalent to the "back wards" described by Barton (1959). Although the hospital has kept apace with clinical developments in psychiatry, with consequent improvement in diagnosis and drug treatment of patients, it has remained essentially custodial in its ward management of patients.

In an attempt to study some of the adverse effects of custodial care on longstay patients, the following survey was done.

Two assumptions are held:–

(1) A chronic patients' ward behavior is related to the degree of restrictiveness of the wards i.e. he/she will behave in a more socially acceptable manner in a less restrictive ward.

(2) The degree of ward restrictiveness is related to the ratio of patients to nursing staff, i.e. overcrowded short staffed wards, dependent almost solely on attendants for patient care, will be most restrictive.

Method and Materials

(i) A total of nine wards in Hospital Bahagia with a combined population of 261 chronic patients, were selected for this study. Chronic patients were defined as those who had been in hospital two years or more, with less than one month's parole (leave from hospital) in that time.

(ii) The following data were obtained from the clinical notes of each patient:– age, sex, race, number of admissions to Hospital Bahagia, diagnosis, current medication, length of inpatient stay (to the nearest year), and frequency of recorded visitors.

(iii) The wards selected were:–

Female 1st Class F1
Female 2nd Class F2
Male 1st Class M1
Two Male 2nd Class wards .....M2a and M2b

These wards are for fee-paying patients, irrespective of their length of stay in hospital.

One of a complex of 8 Female A wards FA1
Two of a complex of 12 Male A wards .....MA6 and MA7.

These wards are for long stay non-fee-paying patients, who have little or no prospect of discharge.

One of the hospital's 14 Farms ..... Farm 5

The majority of the patients who live and work in the farms are selected by nurses and attendants from the Male A (longstay) wards.

(iv) The degree of restrictiveness of each ward was rated on a Ward Restrictiveness Scale (See Appendix I). This Scale is a modification of that used by Wing and Brown (1970) in their comparative study of three British mental Hospitals. The 11

items in Section A are concerned directly with restrictions on the movement of patients, such as the locking of ward doors, being permitted to leave the ward unaccompanied, and the use of seclusion rooms. The remaining 18 items (Section B) are concerned with general rules and routines, e.g. restrictions on the use of bathroom, regulations concerning personal clothing, access to the ward pantry, etc..

The Sister or Senior Hospital Assistant together with the Staff Nurse or Hospital Assistant and the wards' charge (head) attendant were interviewed together on one occasion. A week later, additional information was obtained from the night duty attendant.

The scores of sections A and B are combined. A score of 29 indicates maximum restrictiveness. The lower the score, the more permissive the ward.

Some problems were encountered in scoring which were related to the number of patients in a ward who were affected by the restriction. For example, wards F1, FA1 and MA6 had no patients possessing matches (scoring as restrictive on this item B), yet the number of patients having matches in the other wards (scoring as non-restrictive on this item) was less than three per ward. In another instance, wards F1, F2, M1, M2a and M2b combined to have a weekly complaints meeting with their ward staff. This meeting, conducted in English, was mainly attended by English speaking patients. Though these wards score as non-restrictive on item 15, less than half the patients were in fact free to make complaints.

(v) Patients' behavior were rated on a Ward Behavior Scale (See Appendix II). This is a three point scale (0–2) scoring on 10 items of ward behavior. The maximum score is 20 for the most deteriorated behavior, and 0 for the most acceptable, which is considered normal. This scale is only concerned with ward behavior, not diagnosis.

Each patient was interviewed by the doctor i/c in the presence of a nurse, the occupational therapist and charge attendant. Of necessity, much of the information on the patients' ward behavior was obtained from the charge attendant. Since wards MA6 and MA7 were not accustomed to making detailed observation of patients' behavior, their data was accepted with this reservation in mind.

Results

(i) Characteristics of the patient sample

At the 1972 census of the total patient population of Hospital Bahagia, the majority of patients were in the 31–40 age group. In this sample, the majority of female patients were in the 40–59 age group, while the majority of male patients, excluding the farms, were in the 30–49 age group. In the farms, patients were older, in the 50–59 age group. This probably reflects selection policy, since only those patients thought by attendants and nurses to be non-aggressive, are sent to live on the farms. In this sample there were 164 males and 97 female, a ratio of 1.9 to 1, which corresponds to the ratio of males to females for the total hospital population.

The majority of patients (73%) were first admissions, and 75% of the patients were diagnosed as Schizophrenics. In the 1972 census 64% of the total patient population of Hospital Bahagia, Ulu Kinta were diagnosed as Schizophrenic.

The majority of patients receiving drug therapy were on phenothiazines. All fee paying patients received drugs, while on the other wards in our sample 63% were on no drug therapy.

90% of the patients had been in hospital 5 years or more (range 2 – 35 years).

Only 12 patients in our sample were visited more than 6 times in the preceding year by their relatives, and of these 10 were fee paying patients. 70% received no visitors at all in the preceding two years.

The Sister in charge of F1 and F2 was also responsible for one third class ward. Altogether she had 97 patients. F1 had 16 patients of whom 2(12%) were chronic and included in this study. F2 had 33 patients of whom 15(46%) were chronic. The 97 patients had one staff nurse and one shift duty trained assistant nurse.

The Hospital Assistant incharge of male fee paying wards M1, M2a and M2b had 71 patients. He was assisted by one trained Junior Hospital Assistant. In M1, with 13 patients, 5(38%) were long stay. The results of wards M2a and M2b were so similar and the numbers in the sample so small that hereafter these two wards will be referred to as one – M2. 14 patients (30%) of M2 were long stay. In a ward of acute and chronic patients with inadequate staffing, it is likely the staff attention available for chronic patients will be limited.

(ii) The ward staff situation (See Table I)

TABLE I

	FEMALE			MALE					
	FEE PAYING		NON–PAYING	PAYING			NON–PAYING		
	F 1	F 2	F A 1	M 1	M 2a	M 2b	M A5	M A7	Farm 5
No. of Sisters or Senior Hospital Assistants	1* (responsibility over 97 pateints)		1* (responsibility over 640 pts.)	–			1* (responsibility over 711 pts.)		1* (responsibility over 398 pts.
No. of Staff Nurses or Hospital Assistants	1		2	1 (responsibility over 71 pts.)			2		1
No. of Assistant Nurses or Junior Hospital Assistants	1 – 2 (on shift)		4 (shift)	1			2		2
No. of Pupil Assistant Nurses or Junior Hospital Assistants	6		7	1			2		–
No. of Charge Male Attd. or Female Attendants per ward	1	1	1	1	1	1	1	1	1
No. of shift Male Attd. or Female Attendants per ward	1	1	1	1	1	1	1	1	1
No. of patients/ward	16	33	80	13	29	29	59	62	29
No. of Chronic patients per ward	2	15	79	5	3	14	58	58	26

* Psychiatric Trained

TABLE 2 WARD RESTRICTIVENESS SCALE

	FEMALE			MALE					
	Fee paying		Free	Fee paying			Free		
	F 1	F 2	F A1	M 1	aM2	bM2	MA6	MA7	Farm 5
Score Section A	6	9	7	4	7	7	10	8	7
Score Section B	5	10	15	10	12	10	17	14	14
Total Score	11	19	22	14	19	17	27	22	21
Total No. of patients/Senior Nurse	97		640	71			711		387
Total No. of patients in ward	16	33	80	13	29	29	59	62	29
No. of patients in study	2	15	79	5	3	14	59	61	26

On the 8 FA Wards (with a total of 640 long stay non-fee paying patients) the patient/senior nurse ratio is 6.4 times that of F1 and F2. .

On the 12 MA wards (711 long stay patients) the patient/senior nurse ratio is 10 times that of M1 and M2.

(In practice, on all wards, staff/patient interaction is very little, and actual patient care is relegated to the attendants. Student nurses are temporary, and on account of the shortage of teaching staff, they have inadequate clinical supervision in the wards and they tend to look to the attendants for guidance in the "control" of patients.)

(iii) Results of Ward Restrictiveness Scale

To the casual visitor to Hospital Bahagia the fee paying wards may seem vastly superior to those free long stay wards. However, the scoring on the Ward Restrictiveness Scale demonstrates the basic similarity of all the wards. (See Table 2).

All wards in the Hospital are built round a quadrangle. Internal ward doors are locked at certain times of the day, usually at times of counting patients, when attendants change shift duty. The only exceptions are the male and female first class wards where the number of patients is small. All female patients are unable to leave the ward section unless accompanied by a staff member. In practice, the wards being so short staffed, this means some patients may never leave the ward section. A minority of male patients may leave their wards, unaccompanied. These patients are selected by the nursing staff.

Bathing 'line ups' are the usual practice, with little or no privacy. For 15 months prior to this survey, F1 and F2 patients had been encouraged to wear their own clothing. On all other wards hospital uniform is compulsory. With the exception of F1, all hair washing and all shaving is done by the staff.

In most wards patients do not have their own bed allocated to them, and there is no encouragement to keep personal possessions. On wards that do have pantrys, only attendants have access. Those wards which have newspapers, the papers are removed for safe keeping after 4.00 pm so the time they are available for patients to read is limited. Since it was the practice to lock all except F1, M1 and FA1 patients in their wards after the evening meal, only selected patients can view T.V.

No senior staff were on duty on these wards after 4.00 pm. The nursing staff spoke very frankly and freely about their difficulties in the preceding 15 months in attempting to provide a less restrictive ward environment under the present staff conditions of Hospital Bahagia.

The difference in scores between F1, M1 and F2, are mainly in less restriction of movement.

Differences between second class wards and the

TABLE 3 WARD BEHAVIOR SCALE

	FEMALE			MALE				
	Fee paying		Free	Fee paying		Free		
	F 1	F 2	F A1	M 1	M 2	MA6	MA7	Farm 5
Average Score	–	7	7	–	7	8	8	4.5
No. of *workers per ward	1	2	20	–	1	4	16	15
Average Score of *workers	2	4.5	4.35	–	6	6	5	4

*"workers" = those patients scored as being capable of doing useful work without supervision.

free wards are small, and reflect amenities, e.g. newspapers, a complaints meeting, and (on the female ward) personal clothing. That MA6 should score 27, while MA7 scores 22 is extremely interesting when the geography of these wards in the male long stay section is considered. MA6 with the highest score is furthest from Hospital Assistant's office, while MA7 is adjacent to it.

(iv) Results of Ward Behavior Scale (See Table 3)

Excepting Farm 5, the total average scores of patients were similar for all wards. Those patients scoring 0 on item 6 – i.e. able to work well without supervision in the ward or farm – form an interesting group which hereafter will be referred to as the "workers".

In no case did a worker score above the average score for his ward, even allowing for the (–2) points he gains on account of the fact that he can work without supervision. Moreover all the workers except two had speech. Of the two one was a deaf mute who was able to communicate in meaningful sign language. One patient in 3 of the total sample was mute.

On Farm 5, 60% of the patients worked well without supervision, and only 3 (12%) were unable to work at all. Yet, inpatient stay had been longer, and the age group was older on the farm.

In FA1, 21% of patients could do "cottage industry" type work in the occupational therapy department, where an occupational therapist had been assigned for the past two years.

Only one patient in F1 and F2 could do such work. There were then no such projects available. The Occupational Therapist for F1 and F2 had only been assigned to these wards six months ago. Emphasis was laid on social and group activities. In the total patient sample, 74% had no spontaneous interest, while in F1 and F2 only 59% were thought quite incapable of showing any interest in leisure activities.

For 15 months prior to the survey, efforts had been made by the nursing staff of F1 and F2 and the 3rd class long stay wards of which FA1 was a part, to provide a less restrictive ward atmosphere.

In comparing items in the ward behavior scale the percentage of patients with habitual (score 2) socially unacceptable behavior was significantly higher on the 3rd class wards than on the others. Incontinence, stripping, gribbing food from others did not occur habitually on F1 and F2. But it did occur some of the time (score 1) and to the same extent (11% of patients) as in FA1. 36% of patients on the FA1 are mute, as compared with 11.8% on F1 and F2.

Incidentally, during the 18 months prior to this survey, 2 long stay mute patients from FA wards were transferred to F2, and they regained speech.

Since 63% of the sample were receiving no medication, it is not valid to discuss whether or not cooperation with treatment influenced the scores.

Since 70% of the sample received no visitors at all in the last 2 years, it is not valid to discuss whether or not receiving regular visits influenced the ward behavior scores.

DISCUSSION

The early enthusiasm for the effects of drugs on the long-stay patients in mental hospitals (Krammer and Pollack 1958: Brill and Patton 1959) has been tempered by more recent findings which emphasize the importance of the hospital environment (Shepherd, Goodman and Watts 1961, Odegard 1964). These workers found that when they analysed rates from hospitals before and after the introduction on phenothiazines, the discharge rates *fell after* the introduction of drugs. Wing and Brown (1970) in comparing three mental hospitals in England concluded that there were differences in the clinical and social states of the chronic schizophrenics in the three hospitals, and though they could not relate these differences to the medication prescribed, they were significantly related to the degree of social change and improvement in the hospitals environment.

15 months ago, the author felt that although Hospital Bahagia was not ready to adopt an "open door" policy, it should be possible to increase the personal freedom and responsibility of patients within the locked ward. Attempts were made to provide this on all the wards in the sample, but especially on the fee paying wards. Assessment on the modified ward restrictiveness scale after 15 months showed that all wards scored disappointingly high and there was also very little interward difference. However, the highest scores were on the non-fee paying longstay wards and farms, where the patient/senior nurse ratio was the highest.

What are the possible reasons for this? An understimulating environment can lead to extreme social withdrawal (Wing 1970) in psychotic patients. It is difficult to communicate with a withdrawn patient. In Hospital Bahagia, Ulu Kinta the difficulties are compounded by language problems. Long stay Chinese and Indian patients are often able to speak only their mother tongue. Moreover, with the impossibly high patient/staff ratio, patient care is relegated to attendants, who are already overburdened with custody of ward equipment and ward cleanliness, and they tend to apply the same methods to the custody and cleanliness of patients, e.g. the counting of patients and crockery at each change of attendant shift, the bathing of all patients in a line-up at set times of the day.

It is worrying that student nurses, inadequately supervised in their ward training because of staff shortage, look to the attendants for their models in "controlling" patients.

This study has demonstrated that patients who work are not mute and have lower than average ward behavior scores independent of the ward restrictiveness score.

In our present nursing staff shortage, it may be economically more feasible and just as effective to set up industrial workshops within the hospital ground, staffed by trained (non-medical) personnel from outside factories to teach and supervise patients in paid work.

Moreover, if some patients were attending these workshops daily, the number of patients left on the wards would be reduced, and the nursing staff would have less patients to deal with.

Psychiatrists in countries with community care programmes available differ widely as to whether handicapped long stay patients still in need of care should be looked after by their relatives. (Catterson, Benett Freudenburg 1963). In Malaysia the only available after care is that of relatives, supported by outpatient clinics. In our sample of 261 patients, only 12 were visited more than 6 times a year and 70% had no visitors at all in the last 2 years. Relatives need to be actively involved in the rehabilitation of patients in the early stages if they are to accept them back into their homes, which, at present in Malaysia is the only alternative to life long institutionalisation.

SUMMARY

(i) 9 wards in Hospital Bahagia, with a total of 261 patients were assessed using a Ward Restrictiveness and a Ward Behavior Scale.

(ii) The degree of restriction was high on all wards, but highest in those with the greatest patient/senior staff ratio.

(iii) Habitual socially unacceptable behavior was much less evident in working patients.

(iv) The implications of some of the findings are discussed.

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APPENDIX I

Items of Ward Restrictiveness Scale

A. Movement

(1) Time outside door locked.
(2) Time/times (internal) ward door locked.
(3) Time/times bathroom and toilet door locked.
(4) Time patients went to bed.
(5) If and when patients were locked out of the internal ward.
(6) If and when patients were required to inform nurse when leaving the ward.
(7) Whether free to visit the canteen with permission.
(8) Whether free to visit shop in T.R. with permission.
(9) Whether there was a railed 'airing court' attached to the ward.
(10) Entries in 'seclusion book' in the last month.
(11) Whether patients were kept waiting to be counted.

B. Other restrictions

(1) Access to bed in the day.
(2) Access to bathroom.
(3) Whether nurse (or member of staff) was present whenever the patient bathed.
(4) Whether patients were allowed to do their own laundry.
(5) Whether hair of patients was washed by nursing staff.
(6) Whether beds were made by nurses or a few ward workers.
(7) Whether patients were allowed more than one article of hospital clothing at a time (e.g. sarong).
(8) Whether patients had ready access to their own private clothing.
(9) Whether patients could change into their private clothing without permission.
(10) Whether they had free choice of the amount of rice at meal times.
(11) Whether patients were free to switch on and control the T.V.
(12) Whether patients were allowed to use the ward kitchen for minor tasks - e.g. help themselves to fridge water, (make a drink).
(13) Whether patients were free to smoke at any time outside of dormitory.
(14) Whether a patient could possess matches.
(15) Whether there was normal means of making complaints e.g. ward meetings.
(16) Whether current newspapers were supplied.
(17) Whether patients could lock the toilet door.
(18) Whether baths were screened from other patients.

WARD BEHAVIOR SCALE

		Score
ITEM 1. INCONTINENCE (OF URINE)	1. Most of the time 2. Occasionally, or use drain 3. Absent	2 1 0
ITEM 2. STRIPPING OR EXPOSING	1. Most of the time 2. Occasionally 3. None	2 1 0
ITEM 3. EATING HABITS	1. Good – normal 2. Fair – messy 3. Poor – messy and grabs from others	0 1 2
ITEM 4. PICA	1. Eats edible rubbish 2. Eats inedible rubbish 3. No pica	1 2 0
ITEM 5. COMMUNICATION	1. Normal 2. Irrational 3. Complete withdrawal, no communication	0 1 2
ITEM 6. WORK – IN WARD	1. Good, without permission 2. Good with supervision 3. Cannot work	0 1 2
ITEM 7. WORK – IN O.T. (OR FARM WORK)	1. Good, without supervision 2. Good with supervision 3. Cannot work	0 1 2
ITEM 8. BEHAVIOR (VERBAL OR NON VERBAL)	1. Aggressive – more than 5 times/month 2. Aggressive – less than 5 times/month 3. Non Aggressive	2 1 0
ITEM 9. LEISURE INTERESTS	1. Shows no interest in anything 2. Shows very little interest, but can be persuaded to watch T.V. or read papers. 3. Normal spontaneous interests	2 1 0
ITEM 10. MEDICATION	1. Cooperative 2. Needs supervision 3. Uncooperative	0 1 2

A study on mental retardation in Malaysian Children

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A comprehensive survey on mental retardation among Malaysian children has not been carried out.

However as from January, 1974 onwards, a "test" survey was carried out; I call this a "test" survey in that the main objective of this survey was to obtain confirmation for the need of a more detailed and comprehensive survey. The findings of the Statistical and Clinical Survey of Mental Subnormality in Singapore Children carried out by Professor Freda M. Paul of the Paediatric Department, University of Singapore clearly indicate the need for a more comprehensive survey in Malaysia as well(1).

I now present an analysis of 120 Malaysian cases studied from January 1974 onwards. The majority of the cases studied are from the three Schools for Retarded Children in Selangor. They formed the most easily available source, and the Selangor Association for Retarded Children was keen to have all the children reexamined and reassessed, so that some of them could be recommended for the Special Training Centre set up in Johore Bahru.

In this study the following aspects were studied:

1. The possible aetiological causes with special reference to chromosomal abnormalities. A chromosomal analysis was done on practically every case that was studied. It was a random study, and no special group of retarded children was selected. This aspect of the studies was done in collaboration with Dr. H.S. Yong of the School of Biological Sciences, University of Malaya. Successful analysis was obtained in 93 cases.
2. Psychological Testing was done by Dr. Grace Lim, a Psychologist from Indonesia who fortunately happened to be in Kuala Lumpur, and readily voluntered her services to us. 41 cases were tested. The Wechster Intelligence Scale for Children, Goodenough-Harris Drawing Test, and the Ravens Standard Progressive

Paper presented at Ninth Malaysia – Singapore Congress of Medicine August 1974.

Matrices for children were used in most cases.

3. Anthropometric studies were done on 60 children by Mr. J.B. Lim of the Institute for Medical Research with a view to compare the results obtained with that of a group of normal children.

The Ethnic distribution and sex of the cases studied are now shown in Table I.

Age Distribution was as follows:–

0 – 2 years – 16 cases
2 – 5 years – 6 cases
5 – 12 years – 48 cases
Above 12 years – 46 cases.

Breakdown of Cases Studied

Table I

Ethnic Group	
Malay	36
Chinese	49
Indian	32
Eurasian	3

Sex	M	F
Malay	21	15
Chinese	33	16
Indians	17	14
Others	1	3

Sources of Referral

As mentioned before, the majority of cases studied were from the schools for retarded children. In addition to this, 17 cases were studied from the Neurology Unit of the General Hospital, Kuala Lumpur. 4 abnormal looking neonates were studied from the Maternity Unit of the General Hospital, Kuala Lumpur and 2 babies who were clinically diagnosed as mongoloids were studied from the Paediatric Unit of Seremban General Hospital. 7 abnormal children were studied from the Padang Lebar Clinic of Ulu Jempol in Kuala Pilah District where a Rural Health Research Programme is currently being carried out.

Table II shows the Sources of Referral.

Table II

Sources of Referral	Total No.
1. Paediatric Clinic	1
2. Neurology Ward G.H. Kuala Lumpur	17
3. Maternity Hospital Kuala Lumpur	4
4. School for Retarded Children Jln. Ipoh	33
5. School for Retarded Children Jln. Brickfields	21
6. School for Retarded Children – Sentul	26
7. Padang Lebar Clinic, Ulu Jempol	7
8. Direct	8
9. General Hospital, Seremban	2
10. Municipal Clinic, Brickfields	1
Grand Total:	120

Table III shows the Aetiological Cases.

1. Chromosomal abnormalities – 29
2. Prenatal and natal causes – 20
   (a) Low birth weight – 10
   (b) Maternal Disease – 2
   (c) Neonatal Jaundice – 8 – (Rh incompatability in 2 siblings)
3. Brain Injury and Trauma – 4
4. Metabolic and Endocrine causes – 1 (Hypothyroidism)
5. Epilepsy and related conditions – 22
6. Familial tendency – 20
   Females only affected – 11
   (Twins – 1 pair)
   Males only – 8
   (Twins 1 pair)
   Males and Female affected – 1
7. Meningeal Infection – 2
8. Autism – 3
9. Multiple aetiology – 8
   (a) Osteogenesis Imperfecta – 1

(b) Muscular Dystrophy — 3
(c) Others — 4

10. Causes Unknown — 11
(No cases could be found at all).

As we have only studied a few cases at this time, no attempt had been made to establish the incidence and prevalence among the three ethnic groups in Malaysia.

Analysing the findings broadly, we found:

1. Definite chromosomal abnormalities in 29 cases about which I shall refer to again.

2. Prenatal and natal causes — 20

Out of these 20 cases there was a definite history of low birth, weight and prematurity in 10 cases. History of severe maternal disease in 2 cases. One had suffered from Pre-Eclamptic Toxaemia, and the other was being treated for Hypertension. There was definite history of prolonged Neonatal Jaundice in 8 cases. In two Indian siblings, the jaundice was established definitely due to Rh Incompatability. No definite cause was established in the other cases. This is a preventable cause of mental retardation and the importance of early recognition of Neonatal Jaundice and the awareness of the complications it can cause, and the proper management must be stressed, especially in the rural areas.

Definite history of trauma and brain injury was obtained in 3 cases. In one case there was Congenital Encephalocoel which had been surgically operated on at the Neuro Unit.

3. Endocrine Causes — 1 case of Hypothyriodism was detected and replacement therapy started.

4. Epilepsy and Related conditions

In 4 cases there was evidence of definite Epilepti form attacks, and they were taking regular therapy.

There were 3 cases of Cerebral Palsy. Associated gross neurological abnormalities were seen in 4 cases. In the other cases there was a history of convulsions, mainly febrile convulsions at some time or other. No regular medication was being taken. We have not done any detailed investigations to establish the definite cause in these cases.

5. Definite Familial tendency

This was seen in 20 cases. There were no other associated causes. In 11 cases studied, only the female siblings were affected. There was one instance where both twin sisters were affected. There was also one instance where both twin brothers were retarded. These cases have also to be studied in more detail.

6. Infantile Autism was entertained as the most likely diagnosis in 3 cases.

Additional findings are:

1. Associated Gross Speech Defects were obtained in 33 cases.

2. Consanguinity of Marriage was found only in three families. Two Indians and one Malay.

Cases studied in Rural Area of Padang Lebar. From the 7 cases studied, 2 were established as due to Classical Trisomy G.

1 case — was of severe Cerebral Palsy with mental retardation and the other was of Osteogenesis Imperecto. The great crippling effect of the disease may have slowed down the proper mental development; however the boy was able to attend school for normal children. 3 siblings were studied with muscular dystrophy.

No formal psychological testing was done to establish if there was real mental retardation or not in these cases.

Chromosomal abnormalities. Shown in slides IV, V, VI.

Chromosomal abnormalities studied

The commonest abnormality obtained was classified Trisomy "G" — 25 cases. There was one case of Iso-chromosome "Y" and one case of D–G. Translocation Syndrome. This was diagnosed in a one day old baby referred from the maternity hospital. The mother was 34 yearsone at the time of delivery of the infant. There was an elder sister who has also the typical clinical features of mongolism. Unfortunately, the chromosomal analysis of the whole family has not been successfully completed as yet.

From among the cases established as Mongolism, it was found that 2 mothers were below the age of 20 at the time of birth of the child. 13 mothers were between the ages of 25 — 35 years and 12 mothers were between the ages 35 — 45. In 13 cases studied the youngest and last sibling were affected. In 14 cases, it was found that the mother did have normal siblings after the birth of a mongo-

loid child. I would like to add that in collaboration with Dr. Olga Petre-Quadens from Brussels we are planning to have a clinical trial with 5-Hydroxy-tryptophane on Mongol children who have been detected early in life to see if their mental development will improve with this drug.

Two other interesting findings were obtained from chromosomal analysis done on special referred cases. One was a 16 year old patient referred from the Surgical Unit. The patient was brought up as a girl by her parents and dressed as a girl. However the behaviour pattern was that of a boy. There was no breast development; Genitalia were abnormal with the presence of hypospadias bifid scrotum with bilateral testicles of normal consistency. The buccal smear was found to be negative for Sex Chromatin. Chromosomal analysis showed an Iso-chromosome or Pericentric Inversion of the "Y" chromosome. The effect of Iso-chromosome "Y" can result in (a) Normal Fertile Male (b) Turner's Syndrome. (c) Possibly pure gonadal, dysgenesis as in this case.

On operation both testicles were found to be actively functioning, and the sex established as Male.

The other case was referred from Alor Star. She was a case of Primary Amenorrheoa. She was of short stature – 4ft 6". (Her younger sisters were taller than her). There was no breast development and webbing of the neck was present. Buccal smear – most of the cells were chromatin negative. Chromosome analysis showed two different stem lines – one showed the presence of 45 chromosome with XO pattern the other stem line showed 47 chromosomes with XXX pattern. Turner's Syndrome or a variant of Turner's Syndrome or Turner Mosaic was diagnosed.

Psychological Testing was carried out on 41 cases. Out of these, 11 cases were or proven classical Trisomy "G" Mongolism. Though all the cases were of similar chromosomal abnormality, the majority had an IQ ranging from 40 – 70. However one girl who had been attending the special school for 7 years, showed a much higher IQ level of 70 – 90 at age of 18 years. She could understand 3 languages, read and write simple sentences, enjoy watching television and was a responsible leader in school She had been recommended for special training in Johore. 3 cases were found to be withdrawn and autistic. 1 child showed marked psychological regression probably as a result of parental neglect during the birth of the second sibling. Very poor speech development in 13 cases with associated hearing defect made assessment difficult. However, the marked imbalance between verbal skills (due to lack of understanding) and performance skills shows the need for proper speech training and investigation into associated hearing defects. Observation into the parental attitude towards these children, showed that only 2 were really aggressive and ill treated children. The majority accepted them and three were overprotective and expected too much from the children. Psychological assessment and grading also helped the teachers in the special schools for grouping the children.

Anthropometric Assessment of Growth and Development

Anthropometric measurements were taken on 60 cases with mental retardation drawn mainly (86.6%) from 3 schools for Mentally Retarded Children in Kuala Lumpur, 10.0% from the Neurological & Paediatric Units of Kuala Lumpur and Seremban Hospitals, with the remaining 3.4% from children seeking admission into schools for the mentally retarded. Their ages range between 3 days to 21 years, and belong to both sexes.

Tricep measurements (3) were made using the Harpenden Skinfold Calipers (2), while Mid-Arm, Head and Chest (4,5), Circumferences were made with a non-elastic tape, while height and weight measurements carried out using height and weight scales.

Height curves in relation to their ages and weights were studied, and compared with normal curves (Havard Standards) for normal well-fed children (6). Both findings fell below normal. These seem to indicate that the children under study exhibit some form of structural abnormalities with a tendency to be short-statured and over-weight. We thought perhaps obesity could contribute towards these findings, but skinfold triceps and sub-scapular measurements seem to suggest that perhaps the excessive weights of these groups could be due to their thicker bone and muscular development (7). This is supported by measurements of their mid-arm-circumference.

Anthropometric measurements of their brain weight through head-circumference in relation to body weight indicated that 98% of the groups had head circumferences falling below the normal standard for children with normal brain and intellectual development. Chest-head ratios also suggest

low brain weight and poor mental growth.

Conclusion:

This is a small survey of 120 cases of Mentally Retarded Children. From the analysis it was found:-

1. Neonatal Jaundice and Kernicterus is a preventable cause of mental retardation. It still occurs. The early recognition, dangers and proper management have to be stressed to medical and paramedical staff, especially in the rural areas.
2. Associated Gross Speech Defect was seen in 33 cases. Proper facilities for speech training in these children will greatly benefit them.
3. Genetic counselling is recommended for cases having specific chromosomal abnormalities
   (a) particularly in young mothers below 25 years of age with one Mongol child (of Trisomy G type) since there is a 50 fold increase in the random risk of her having another Mongol child (8).
   (b) Mothers having translocation type of Mongol children.
4. Proper psychological testing and psychotherapy can play a very important role in the management of these children.
5. A more detailed and comprehensive study covering the whole of Malaysia should be carried out.

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Smoking habits among medical students in the University of Malaya

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The health hazards of cigarette smoking have been extensively documented, and the smoking habits and morbidity associated with smoking have been investigated in several communities. In many countries restriction of sales promotional activities are coupled with attempts at publicising the health hazards in an effort to reduce the prevalence of cigarette smoking. The role of the medical profession has been repeatedly emphasised and the Report of the Royal College of Physicians, London 1970 stated that "doctors should abstain from smoking and take every opportunity to urge their patients to follow their example. Medical students should be instructed about the effects of smoking and their responsibilities in this matter must be brought home to them".

In Malaysia, there is little epidemiological information on the smoking habits of Malaysians or of the morbidity associated with smoking. However, local cigarette tobacco production has increased from 12.9 million lbs in 1966 to 16.7 million lbs in 1970. There is no restriction on cigarette sales promotion, and little community wide publicity on the health hazards of smoking. However the medical undergraduate programme in the University of Malaya does emphasise the health consequences of smoking The aim of this study was to investigate the smoking habits of Malaysian medical students and compare them with studies on their counterparts in other parts of the world.

METHOD

A questionnaire intended for self completion was administered during September – November 1972 to each class of medical students during laboratory sessions of the entire class in which students occupied individual desks. The questionnaire was distributed by the lecturer in charge who emphasised that the questionnaire was anonymous. Students who did not wish to participate were advised to return their questionnaires uncompleted and non response was calculated by the number of blank forms that were returned. Students who were absent at the class were subsequently administered the questionnaire on an individual basis. The questionnaire which was based on the pattern used by the U S. Bureau of Census to collect data on the smoking histories of the people in the U.S. was in four short sections – personal identification data (other than name), personal smoking habits, parental smoking habits and personal educational background. Students who claimed to be smoking at least one cigarette a day or an average of more than 7 cigarettes a week were classified as regular smokers while others were designated occassional smokers. Those who had only taken a few puffs were regarded as never having smoked. Although students were not forbidden to discuss their questionnaire with each other, most students completed and returned their questionnaires in 10–15 minutes and few students indulged in discussion. Students who indicated on their questionnaire that they were in doubt as to the meaning of any question were coded as "UNKNOWN" for that characteristic.

RESULTS

The 654 matriculated students came from every

TABLE I

ETHNIC GROUP, SEX AND SMOKING HABIT OF MEDICAL STUDENTS

	SEX				ETHNIC GROUP						
SMOKING	MALE		FEMALE		MALAY		CHINESE		IND. & OTHERS		
HABIT	No.	%	No.	%	No.	%	No.	%	No.	%	TOTAL
CURRENT	125	25.2	2	1.6	46	28.2	62	16.3	19	23.5	
BEFORE	88	17.7	0	0	22	13.5	54	14.2	12	14.8	
NEVER	284	57.1	126	98.4	95	58.3	265	69.5	50	61.7	
TOTAL	497	100.0	128	100.0	163	100.0	381	100.0	81	100.0	625
	df = 2 X^2 = 76.99 p <0.001				df = 4 X^2 = 10.97 0.02<p<0.05						

State in the country. There were students from each of the three major ethnic groups resident in the country and 80.3% of the students were males.

Over 95% of the students returned adequately completed questionnaires. The non response rate ranged from 4.5% among Chinese students to 5.5% among Indians. Among males the non-response rate was 5.3% while only one female did not respond.

Of the 625 respondents, 20.3% claimed to be current smokers while a further 14.1% had smoked previously. The smoking habit was confined almost entirely to male students, there being only two female students who had ever smoked. Among the three major ethnic groups, Malay students had the highest proportion (28.2%) of current smokers compared to 16.3% amongst Chinese and 23.5% amongst Indians and others. The association between ethnic group and smoking habit was significant at the 0.05 level.

TABLE II

AGE DISTRIBUTION, YEAR OF ENTRY AND SMOKING HABITS OF MALE MEDICAL STUDENTS

	AGE				YEAR OF ENTRY			
	< 22 yrs		22 yrs+		1971–72		1966–70	
	No.	%	No.	%	No.	%	No.	%
Current	23	15.1	96	30.5	26	15.7	91	28.8
Previous	30	19.7	52	16.5	33	19.9	53	16.8
Never	99	65.1	167	53.0	107	64.5	172	54.4
TOTAL	152	100	315	100	166	100	316	100.0
	Age unknown: 30 df = 2 X^2 = 12.73 0.001<p<0.01				Year of Entry unknown: 15 df = 2 X^2 = 10.214 0.001<p<0.01			

Age group and year of entry

Among the male students, an average of only 15.5% were currently smoking during their first two years in the Faculty. However during the third year of university life 25.7% became current smokers and there was an average of 28.8% current smokers among students who remained in the faculty for the third, fourth, fifth and sixth year. Similarly, among students below the age of 22 years only 15.1% were current smokers while 30.5% of those aged 22 years and above were smoking currently ($p<0.01$).

Age started smoking

Of the 215 students who had ever smoked 37 could not recall the age at which they started the habit. Of the 178 (82.8%) who responded to this question 43.8% had been introduced to the habit during the ages 18–20. The ethnic variation in age of starting was small and not significant.

Parental smoking habit

607 students reported on their father's smoking habits compared to only 483 who gave information on maternal smoking habits. There was no association between student's smoking status and paternal smoking habit. The relatively poor response rate for information on maternal smoking habits which was probably due to weakness in questionnaire design makes it difficult to assess association between maternal and student's smoking habits.

Regularity of smoking habit

Of the 127 current smokers 80 (62.9%) claimed to be regular in their habit, the others being occassional smokers. 78 of these regular smokers provided information on the amount they smoked and only 19 admitted to smoking an average of more than 10 cigarettes a day. There was no significant association between ethnic group and either regularity of habit or the amount smoked.

TABLE III

PARENTAL AND STUDENTS' SMOKING HABITS

STUDENT'S SMOKING HABIT:	FATHER'S SMOKING HABIT*				MOTHER'S SMOKING HABIT					
	YES		NO		YES		NO		UNKNOWN	
	No.	%	No.	%	No.	%	No.	%	No.	%
CURRENT	74	59.7	50	40.3	24	18.9	83	65.4	20	15.7
BEFORE	55	63.2	32	36.8	6	6.8	57	64.8	25	28.4
NEVER	212	53.5	184	46.5	36	8.9	277	67.6	97	23.5
TOTAL	341	—	266	—	66	—	417	—	142	—

*Father's habit unknown:
18 (2.9%)
$X^2 = 3.492$
df = 2
$0.01<p<0.2$

TABLE IV

REGULARITY OF BACKING HABIT AND AMOUNT SMOKED

	CURRENT SMOKER'S HABITS				AMOUNT SMOKED BY REGULAR SMOKERS*				
	Regular		Occassional		1 – 9		10 – 39		TOTAL
	No.	%	No.	%	No.	%	No.	%	
MALAY	30	66.7	15	33.3	23	82.1	5	17.9	28
CHINESE	37	59.7	25	40.3	27	73.0	10	27.0	37
INDIAN/OTHERS	13	65.0	7	35.0	9	69.2	4	30.8	13
TOTAL	80	63.0	47	37.0	59	75.6	19	24.4	78
	X^2 = 0.59 df = 2 $0.7<p<0.8$				*Amount smoked unknown = 2 students df = 2 X^2 = 1.07 $0.5<p<0.7$				

DISCUSSION

The Malaysian medical profession has displayed a sporadic interest in the health hazards of smoking in the community but this has not yet resulted in any organised sustained measures to counter the economic, commercial and social pressures favouring cigarette smoking. In the Malaysian medical undergraduate curriculum students are made aware of the mortality and morbidity as well as the socio economic and psychological factors associated with cigarette smoking. The topic is discussed in lecture, or seminar form as well as in patient-case discussions during the second through to the fifth year of the course.

Despite the access to information on smoking hazards Malaysian medical students have a higher smoking rate (20.3%) than their counterparts in the Faculties of Engineering, Education, Agriculture and Science (15.5%)[1]. Comparison of smoking habits among Malaysian and Glasgow medical students[2] showed that male Malaysians smoke more (25.2%) than their Glasgow counterparts (19.8%). Malaysian females hardly indulged in the habit (1.6%) compared to their Glasgow sisters who had rates similar to their male counterparts.

Both in Malaysia and in Glasgow, smoking prevalence increased suddenly from approximately 16% to 27% after two (Malaysian) or three (Glasgow) years of University life. Physicians in the United Kingdom have been seen to have lower smoking

TABLE V

COMPARISON OF MALAYSIAN AND GLASGOW MEDICAL STUDENTS

	Total No. of Matriculated Students	% responding to questionnaires	Percentage current smokers		
			M	F	Both
Malaysian 1972	654	95.6	25.2	1.6	20.3
Glasgow 1971	749	95.3	19.8	17.5	19.1

rates after wide publicity given to medical and scientific evidence on the health hazards associated with smoking[3]. Malaysian medical students have a higher smoking rate during the years when they are studying this evidence than during the years immediately preceeding It would be interesting to study the factors contributing towards this phenomenon.

It is of note too that among Malaysian students, Malays had a higher smoking rate than the Chinese. But the smoking habits of students and their fathers was not associated. Since all the students live and work in the same environment during most of their years in the Medical faculty, the reasons for the ethnic difference in smoking rate is another interesting question.

SUMMARY

In a study during 1972 of smoking habits of Malaysian medical students, smoking rates of medical students was seen to be higher than that of students in four other faculties in the University of Malaya. Male Malaysian medical students had higher smoking rates than their counterparts in Glasgow in 1971 but Malaysian females had very low smoking rates.

Despite the fact that in the medical curriculum students are made aware of the scientific evidence on the health hazards of smoking, smoking rates were higher in students in their later years of study. Ethnicity was associated with smoking rates although father's smoking habit was not – and Malays had the highest smoking rates.

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Some Observations of the Typhoid outbreak in Sungai Padang, Perlis

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Introduction

Typhoid or Enteric Fever is a common problem encountered by doctors in Perlis. It occurs all the year round and has been to be considered in the differential diagnosis of any pyrexia of unknown origin. From July to September 1974, there occurred an outbreak of Typhoid Fever in a small Village called Sungai Padang that is situated about 10 miles south of Kangar. The outbreak was investigated by the Health Department and was considered to have arisen from a feast or "kenduri" that was held in June 1974. The aim of this paper is to present some of the clinical features of this outbreak.

Number of cases

Altogether, there were 93 cases of typhoid fever, together with 7 relapses.

Sex Ratio

There were 56 males and 37 females cases, giving a male to female ratio of 1.5:1. Other workers have also noted a greater incidence of the disease in males, probably due to the nature of the occupation that will bring them into greater contact with other cases or carriers (Stuart and Pullen, Price).

Age Distribution

The ages of the patients varied from 11 months to 60 years. The maximum cases, however, occurred in patients who were in 10–25 years age group. This is in keeping with other workers findings (Price). Table I shows the age distribution of the various patients.

TABLE I

Age group (in years)	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
No. of patients	7	11	26	14	8	6	3	5	3	3	6	1

Racial Distribution

Except for 1 child, all the other patients were Malay. This reflects the ethnic distribution of a Malay kampong.

Mode of Onset

Most of the patients were padi-planters without any education. They made poor historians and it was difficult to get an accurate idea of the mode of onset of the illness. Moreover, many of them still harbour a distrust for western medicine and therefore did not come forward for treatment till they really felt ill or were coaxed by the Health authorities to do so. We were, however, able to gather that many cases were mild enough to remain ambulant for long (in one case for 40 days). Others, though extremely ill and toxic, did not come till they were in extremis. We shall now present the different features noted in the patients in some detail.

Skin Manifestations

Only 3 patients showed the presence of rose-spots. This gives an incidence of 3%, though other workers have given a higher incidence than this (10–20% in Price). The spots were probably not seen more ferquently as the patients tended to present late in the illness while the spots are more common towards the end of the first week.

There was only 1 case of bed-sores and this was in a young adolesent girl whose parents refused to come to hospital till very late. She made an uneventful recovery.

Temperature

Though the classical description for the fever is the step-ladder type, we actually observed this in very few cases. Most patients had an intermittent type of fever and it reached a maximum of 102–104°F. Christie has mentioned that typhoid fever should be regarded as a febrile illness, but undue emphasis should not be placed on the pattern of the fever.

Several of our patients complained of 10–20 days fever at home but after admission to the ward, they were almost afebrile, showing only low spikes of fever here and there. Probably they had mild attacks of the disease that was remitting spontaneously by the time they were admitted.

Neuromuscular Manifestations

Most patients complained of generalised body-aches pains. Headache was also a frequent complaint, while 3 patients had typhoid psychosis; two in their initial attack and one during a relapse. Table II shows the incidence of neuromuscular manifestations noted.

TABLE II

Manifestations	No. of patients
Generalised Bodyaches and pains	29
Headaches	16
Dizziness	1
Psychosis	3

Respiratory Manifestations

Respiratory manifestations are a common finding in patients with typhoid fever. This was also the case in our series. A mild degree of bronchitis was particularly common amongst these, especially in the first week of the illness. Two cases of pneumonia were also seen. No cases of epistaxis were noted, though this is an important feature also. Table III summarises the respiratory manifestations seen in our series.

TABLE III

Manifestations	No. of patients
Coryza	1
Sore-throat	2
Chest pain	2
Bronchitis	17
Pneumonia	2

Gastro-Intestinal Manifestation

Though typhoid fever is essentially a septicaemic illness, a great deal of pathology occurs in the intestine and gastro-intestinal manifestations are therefore quite common. Most authorities quote as constipation being more common than diarrhoea in typhoid fever, but in our series, the findings were

exactly opposite. We have noted this also amongst other patients, and in fact, any patient who presents with a high fever with diarrhoea is normally scrutinized for enteric fever by us. The diarrhoea, however, was not a severe and protracted type but was actually quite mild. Another sign that is helpful in typhoid fever is gurgling that can be elicited in the lower abdomen, especially in the right iliac fossa. Table IV summarizes the main gastro-intestinal manifestations.

TABLE IV

Manifestation	No. of patients
Nausea	3
Vomitting	20
Anorexia	22
Abdominal Distension	7
Abdominal Pain	11
Sordes	15
Constipation	8
Diarrhoea	20
Glossitis	2
Parotitis	1
Gurgling	13

Incidence of Hepatosplenomegaly

We noted the presence of hepatosplenomegaly in our series and found the incidence to be as shown in Table V.

TABLE V

Findings	No. of patients
Hepatomegaly only	35
Splenomegaly only	3
Hepatosplenomegaly	54

Thus, it can be seen that 92 of a total of 100 cases showed enlargement of one or the other organ at least. This is a useful finding to note. Cecil-Loeb's Textbook of Medicine states that a spleen can be palpated in about 75% of patients. The enlargement of the liver and spleen was not gross and it regressed with therapy. Jaundice was noted only in 4 cases.

The white cell count

Most patients had a white cell count in the range of 4,000–10,000/c.mm. Only 7 patients had counts of less than 3,000 while 16 patients had counts exceeding 10,000/c.mm. A relative increase in the proportion of lymphocytes was commonly noted; this was noted in 50 of the patients, who had more than 33% of lymphocytes in their differential count.

Pregnancy and typhoid

One lady who was pregnant had a premature delivery at eight month s gestation. The baby was admitted to the hospital but made good progress and was discharged after an uneventful stay in the premature unit. The mother recovered from her attack, but had a relapse some days after discharge. Other workers have also noted typhoid to hasten the onset of labour (Stuart and Pullen).

Morbidity and Mortality of the series

There were no deaths in our series of patients. No definite case of perforation was noted, though one lady had an episode of severe pain in the right iliac fossa some days after admission. She was treated with a drip and suck regime and Chloromycetin and responded very well to this. Another young boy had one episode of intestinal bleeding, but this too. stopped with conservative management.

Relapses

Seven relapses were seen in our series, giving a percentage of 7.5%. All these patients relapsed within two weeks of the first attack. The relapses were as severe as the original attacks and had to be treated with the same intensity. In one instance, (the pregnant lady), the relapse was far worse than the initial attack, the patient presenting with severe typhoid psychosis.

Management

All the patients were nursed in isolation, two special wards being set up for this purpose.

i) *General Management:* This consisted of correcting dehydration, electrolyte imbalance, anaemia and attention to prevention of bed-sores and other minor complications. In most cases, dehydration was corrected with oral fluids, but two cases were bad enough to need initial intravenous supplementation. Few other patients were transfused with blood, while one had to be given intravenous amino-acids to build him up. Diet for these patients was the hospital typhoid diet; this is a semi-solid diet with no roughage.

ii) *Drug therapy:* The main drug used was chloromycetin, usually given orally, though in a few cases the succinate preparation was given parenterally in the initial stages. Most workers still find chloromycetin more effective than ampicillin in treating typhoid fever (Robertson et al), though Bactrim is gaining favour with others as a possible alternative.

The dose of chloromycetin for adults was. 500 mgm 6 hrly till the patient was afebrile for at least two days, and then it was halved. Duration of therapy was for at least 14 days, though this was prolonged if the fever did not settle properly. For children, the dosage was 50/mgm/kg/day initially. and then halved when the child was afebrile. Higher doses were used for both children and adults if the response was poor. All patients on chloromycetin had regular white cell counts. One patient developed an allergic rash to chloromycetin and was changed over to Bactrim. Another patient had marked leucopaemia after being on chloromycetin for a long time. A bone marrow biopsy was done and found to be normal. He was further managed on ampicillin.

Ampicillin and Bactrim were the alternative drugs used, either singly or in combination with chloromycetin. Table VI gives a break down of the drugs used in the different patients;

The time taken for the fever to settle after initiation of therapy ranged from one to seventeen days, but the average time taken was five days.

The use of Steroids

Prednisolone was given to patient whose fever did not settle after 5–6 days of therapy with antibiotics or who remained very toxic. Generally a three day course of treatment was given – 30 mgm, 20mg and 10mg on 3 consecutive days for adults – but the regime was often modified to suit the individual patients. No adverse effects were noted with the use of this drug. In all, 22 patients were given steroids.

TABLE VI

Drug	No. of Patients
Chloramphenicol	93
Ampicillin	1
Bactrim	0
Chloramphenicol and Ampicillin	3
Chloramphenicol and Bactrim	2
Chloramphenicol and Bactrim and Penbritin	1

Duration of stay

The average duration of stay for the patients was 25 days, though the longest stay was for 2 months. This period includes the time taken to do 3 consecutive stool clearances on the patient after the cessation of therapy.

Discussion and Conclusion

The data have tried to illustrate some of the common features of typhoid fever as seen in a small outbreak. On the whole, they agree with the findings of other workers, but some important factors stand out Rose spots are not as common as described, while in our series, diarrhoea was more commonly noted than constipation. Enlargement of the liver and spleen, either alone or in combination is a very helpful sign in patients with fever. Actual leucopaenia is not common, but the count is frequently within the normal large, with a lymphocyte predominance.

We also did not have any mortality in our series, and this is a most encouraging sign. We were also fortunate not to have any dangerous complications like intestinal perforation.

Chloromycetin was found to be an effective

drug in the management of these cases. Ampicillin and Bactrim were useful as adjuncts or alternatives. There was no really serious side-effect noted.

Acknowledgements

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ii) We also thank Cik Mahani binti Othman for typing the manuscript.

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A rational approach to infant feeding in the management of sugar intolerance associated with infantile enteritis

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Introduction

SUGAR intolerance is a frequent complication of infective diarrhoea. Of the 328 cases of diarrhoea admitted to Paediatric Ward 4 of the University Hospital, Kuala Lumpur in 1973, there were 107 cases of sugar intolerance. The initial causes of diarrhoea in these 107 cases are summarised below.

For the correct management of this condition, a knowledge of the pathophysiology of sugar intolerance as well as the composition of various infant feeding formulae available locally is essential (Table 2).

Table 1:

AETIOLOGY	NUMBER OF CASES	
Salmonella	16	31
Enteropathogenic E. Coli	12	
Shigella	3	
No growth of pathogenic organism in stool culture		76
Total:		107

Table 2: Artificial Feeding Formulae with Low Lactose Content ('Lactose Free')

		Carbohydrate	Protein	Fat	Calories/fl.oz.
1	Sobee (Mead Johnson)	Sucrose	Soy-bean	Soy & coconut oils	20
2.	Isomil (Ross Div. of Abbot)	Sucrose	Soy-bean	Corn & coconut oils	20
3.	Nutramigen (Mead Johnson)	Surose	Casein-hydrolysate	Corn oil	20
4.	al_{110} (Nestle')	Glucose	Purified casein	Butterfat & corn oil	20

5.	Pregestimil (Mead Johnson)	Glucose	Casein-hydrolysate	Medium chain triglycerides	20
*6.	Sirolac (CF_1) (Nestle')	Carbohydrate-free	Coprecipitate of cow's milk protein	Butterfat	12

* *Sirolac (CF_1)* – available in fluid form from Nestle' (CSIRO), Australia. It is a milk-based formula made from a medium calcium coprecipitate which differs from ordinary cow's milk by the lack of the principal whey allergens, bovine serum albumin and beta-lactoglobulin. Butterfat is added to give a composition yielding 12 Cals./fl. oz.

Normal Absorption of Carbohydrates

Carbohydrate in the diet of an infant consists mainly of lactose, sucrose, glucose, starch and glycogen. The polysaccharides, starch and glycogen, are hydrolysed by pancreatic and intestinal enzymes into disaccharides. The disaccharides are then broken down to their monosaccharide components by disaccharide enzymes located in the small intestinal mucosa.

Starch / Glycogen $\xrightarrow{\text{amylase etc.}}$ Maltose / Isomaltose $\xrightarrow{\text{disaccharidases}}$ glucose

Sucrose $\xrightarrow{\text{sucrase}}$ glucose + fructose

Lactose $\xrightarrow{\text{lactase}}$ glucose + galactose

The absorption of glucose involves an active transport process. Fructose is probably absorbed by a process of facilitated passive diffusion.

Disaccharide Malabsorption

The intestinal mucosa is damaged to a varying extent in acute gastroenteritis, giardiasis, gastro-intestinal allergy and certain other rare chronic disorders of the small intestines. Varying degrees of villous atrophy occur and in serious cases the mucosa becomes more or less flat.

Disaccharidases are located in the external membrane of the epithelial cell. In the above disorders, the enzyme levels are reduced to a variable extent: lactase being least in amount is usually affected earliest followed by sucrase and maltase. Defective hydrolysis results in pooling of disaccharides in the gut lumen whereby bacterial fermentation occurs producing a lowering of pH to 4 or 5, gaseous distension and an osmotic diarrhoea. The continued use of the offending sugar leads to protracted diarrhoea with consequent malabsorption, marasmus and not infrequently death.

Detection of Sugar Intolerance

Sugar intolerance can be recognised clinically by a watery explosive diarrhoea associated with abdominal distension and perianal excoriation. The diagnosis is readily confirmed by stool testing.

The liquid stools are collected by lining the napkins with a plastic sheet. Acidity is estimated by using pH paper or 'Labstix'. Reducing sugars are detected by the addition of 2 volumes of water to 1 volume of liquid stool and thoroughly mixing. 15 drops of this suspension are transferred into a test-tube and a 'Clinitest' tablet added. The presence of more than ½% sugar indicate sugar intolerance. This test can be similarly performed using Benedict's solution but *not* with 'Clinistix'. It is important to realise that sucrose is a non-reducing sugar and will not be detected by this method unless hydrolysis of the sucrose is effected by the addition of 2 volumes of 0.1N hydrochloric acid to 1 volume of liquid stool, boiling for 1 minute allowing to cool and adding 'Clinitest' tablet to 15 drops of the mixture.

Clinical Application

Initial therapy of diarrhoea involves the correction of fluid and electrolyte imbalance by intravenous infusion or in mild cases with a clear fluid such

as 5% dextrose N/5 saline. If tolerated, ¼ strength cow's milk is introduced. If no diarrhoea occurs, the strength of the milk is gradually increased to full strength full-cream milk.

Should watery diarrhoea develop and reducing substance be found in the stools, a diagnosis of sugar intolerance is established. As this is most likely to be lactose intolerance, lactose must be excluded from the diet. A sucrose containing formula such as "Sobee", "Isomil" or "Sucrose-Nutramigen" is substituted (see Table 2). If diarrhoea ceases, lactose intolerance is confirmed and the child may be discharged on one of these partial 'lactose-free' feeding formulae.

Persistence of diarrhoea while on "Sobee", "Isomil" or "Nutramigen" suggests sucrose intolerance. A glucose-based formula such as "al_{110}" or "Pregestimil" is substituted. In total sugar intolerance, glucose is not absorbed and a carbohydrate-free preparation such as "Sirolac" is required. When using "Sirolac", a 10% dextrose drip is necessary to prevent hypoglycaemia and ketosis. Fructose followed by glucose are subsequently added to plain "Sirolac" in increments of about 1% daily until a concentration of 7.5% monosaccharide is reached whereby the mixture would yield 20 Cals./fl.oz. "Sirolac with 7.5% glucose is rather similar to "al_{110}" and hence the patient may be discharged with the latter and recalled for milk challenge after 1 month.

Intravenous alimentation is indicated in those patients with continuous diarrhoea despite the measures outline above. This procedure is complex and not without risk. It must be carried out in a centre where adequate facilities exist.

Milk Challenge

"Lactose-free" formulae are continued for approximately 1 month by which time the intestinal enzyme activity has usually returned to normal. The child is then readmitted for milk challenge. Three feeds of full-strength full-cream milk are offered and if tolerated the child is discharged on this milk. If diarrhoea associated with the presence of reducing substances in the stool appears, the previous formula is continued for another month and the milk challenge repeated. These principles are illustrated in the flow chart (Fig. (i)).

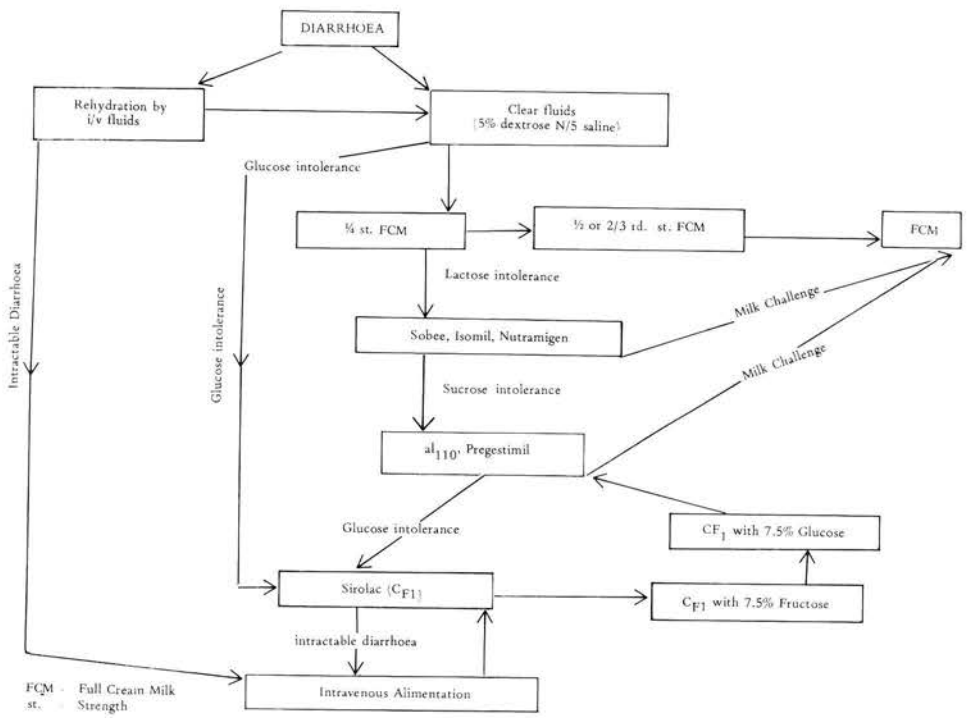

Table 3:

SUGAR INTOLERANCE IN THE FIRST MONTH OF LIFE.

Sugar Intolerance	Number of Cases
Disaccharides	13
Monosaccharides	12
Intractable diarrhoea	6
Total:	31

Results

In the 107 cases of sugar intolerance diagnosed at the University Hospital, 58 were intolerant to disaccharides (lactose and sucrose); 37 to monosaccharides (glucose and fructose) and 12 developed intractable diarrhoea (unresponsive to therapy with "Sirolac").

95% of these cases (102 patients) were below the age of one year. 31 cases occured in the first month of life (see Table 3).

The mortality rate with this regime was 13% (18 deaths). 13 of the deaths were due to profound septicaemia, 4 to intercurrent pneumonia and 1 to an Addisonian crisis. All these children were grossly debilitated on presentation to the University Hospital and most had had intractable diarrhoea for some time.

Summary

1. The incidence of sugar intolerance complicating bowel infection in 328 children seen at the University Hospital, Kuala Lumpur from January to December 1973 was 32.6%.
2. The pathophysiology of sugar intolerance is presented.
3. The diagnosis and management of sugar intolerance are discussed.

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Analysis of 2-category data from two matched samples

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Introduction

In medical and epidemiological investigations, matching of similar subjects is commonly used to minimize the effects of extraneous factors that may confound the factor which is under study (Mainland, 1963; MacMahon and Pugh, 1970). In the case of individual matching (i.e. one control is matched with one case in a case-control study), the analysis is due to McNemar (1947). Pike and Morrow (1970) developed a test which handles any number of controls which are matched to a single case (Appendix 1). However, not infrequently an investigator may want to match a group of controls with a group of cases which need only show a certain degree of similarity in the matching variable(s). In more general terms, a number of subjects in the first group is matched with a number of subjects in the second group. For example, in a clinical trial to compare the effects of two drugs, there may not be enough subjects available which exhibit sufficient similarity in the relevant matching variables, such as sex, age, weight and so on, to enable pairing (individual matching). In an observational study which is based on available records, individual matching may be achieved only at the great expense of data attrition. A good example of data attrition is shown by Christiansen's matched sample of high school graduates with high school dropouts. He had to discard over 96% of his completed interviews in order to finally achieve a matched sample of 46 cases (Chapin, 1955).

In the foregoing situations, group-matching (sometimes called "stratification") can be a good compromise. The principles underlying matched sampling and the various group-matching methods (i.e. interval, frequency or quantile matching and the like) are discussed in MacMahon and Pugh (1970), Althauser and Rubin (1970), and Rubin (1973).

There are several statistical methods which can be adapted for the analysis of dichotomous data from two grouped-matched samples. However, some of these methods are presented technically in specialized statistical literature and therefore are not generally known to the medical investigator.

The objectives of this article are as follows:

(1) To survey some statistical methods that are relevant for the analysis of dichotomous data from two grouped-matched samples.

(2) By means of a numerical example, to illustrate Berkson's (1968) minimum logit chi-square method. This method is, in my opinion most useful in terms of computational simplicity and accuracy.

(3) To facilitate computations, I have written a FORTRAN program of the Berkson analysis. The program, along with detailed user's instructions, is available upon request.

Concepts, Terminology and Examples

It is useful at this point to briefly clarify a few terminologies which will be used repeatedly in the subsequent sections: Factor under study, matching variable, extraneous variables and response variable. In a study of possible association between variables, the factor under study is the variable (i.e. smokers vs. non-smokers) which the investigator suspect to have some influence (but not necessarily a direct

cause) on the outcome of the response variable (cancer/not cancer). A matching variable is a possible confounding variable (i.e race, sex, age, etc..). That is, a matching variable is one that is related to the response variable and for this reason, must be made equivalent or comparable between the two groups (smokers and non-smokers). Imagine if age were related to cancer and one is comparing an older group of smokers with a younger group of non-smokers! Matching will make such "incomparable" comparisons unlikely. In effect, matching will produce similar distributions of the confounding variable (age) in the two groups (smokers and non-smokers) and will therefore make the two groups comparable, so far as this confounding variable is concerned. (For the proper selection of matching variables, see pages 253–256 in MacMahon and Pugh). The extraneous variables are all of the suspected and not suspected confounding variables that go unmatched for various reasons. Therefore, in any investigation, the two groups are seldomly, if ever, perfectly comparable.

The following are a few additional examples which are two group-matched samples with a dichotomous response variable:

(1) A therapeutic trial to compare the effects of amplicillin (a derivative of penicillin) with a standard penicillin (factor under study) on curing urinary tract infection (response variable) in pregnant women. Say after seven days of administration of the antibiotic, a negative culture would be considered "cured" while a positive culture, "not cured". The possible matching variables would be race, age and the physiological state of the woman.

(2) In a survey to compare the working and non-working married women on their attitude towards children, a question such as this could be use: "Having children is the most important function of marriage." The response variable would be agree/disagree. The possible matching variables are the ethnic group, age, religion and educational background of the woman.

(3) Sometimes, an investigator may want to group a quantitative response variable into a dichotomy. Thus, in a survey to compare the haemoglobin levels (response variable) between children living in high altitude and children living in low altitude (factor under study). Haemoglobin level might be grouped into two classes, those with $\leq$ 12 gm% and those with 12 gm%.

(4) In a prospective epidemiological study, the factor under study is typically the groups that are exposed and not exposed to the suspected "risk" of the disease. The response variable is the presence/absence of the disease. Thus, in a prospective study of the possible association between the use of oral contraceptives and thromboembolic disease in women or reproductive age. The factor under study would be the users (exposed to risk) and non-users (not exposed to risk) of oral contraceptives. Presence/absence of thrombosis would be the response variable. Possible matching variables are ethnic group and age. But note that if the same investigation were to be carried out as a case control retrospective study, then the two groups ("factor under study"), would be the cases (thrombosis) and controls (non-thrombosis) and the "response variable" would be users and non-users of oral contraceptives.

In all the studies of this type, the questions of interest are:

(1) Is the response variable (i.e. percent of the patients cured) differ significantly (in the statistical sense) between the two groups (i.e. amplicillin vs penicillin)?

(2) Is the response variable differ significantly among the levels of the matching variable (i.e. the age of the patients) on the whole?

(3) Does the response variable exhibit significant interaction between the factor under study (amplicillin vs penicillin) and the matching variable (age)? For instance, supposing amplicillin were more 'effective' in curing patients of the younger age group while penicillin, older age group, this would constitute one form of interaction between factor under study and matching variable.

Statistical Background

The basic data generated from such a study might be arranged as follows:

Level of the matching variable	Group 1			Group 2		
1	n_{11}	t_{11}	p_{11}	n_{12}	t_{12}	p_{12}
2	n_{21}	t_{21}	p_{21}	n_{22}	t_{22}	p_{22}
⋮		⋮			⋮	
i	n_{il}	t_{il}	p_{il}	n_{i2}	t_{i2}	p_{i2}
⋮		⋮			⋮	
r	n_{rl}	t_{rl}	p_{rl}	n_{r2}	t_{r2}	p_{r2}

Notations n_{ij} is the number of subjects in the ij^{th} cell; t_{ij} is the number of "positive" (i.e. cures) in the ij^{th} cell; $p_{ij}= (t_{ij}/n_{ij}) \times 100$ is the % "positives" in the ij^{th} cell.

Now, if the response variable had been on the quantitative scale (i.e. body weight), the data would be subjected to a regular analysis of variance (a 2-way classification with unequal subclass numbers). But here, the response variable is dichotomous, resulting in a single value (p_{ij}) for each cell. The linear statistical model associated with this design might be represented as $p_{ij}= P+S_i+G_j+(SG)_{ij}+e_{ij.}$, where S_i is the effect of the i^{th} level of the matching variable, G_j is the effect of the j^{th} group (j=1 or 2) and $(SG)_{ij}$ is the interaction (lack of independence) between S_i and G_j, and $e_{ij.}$ is the random error associated with p_{ij}. The p_{ij} values should not be subjected to the variance analysis as the variance of p_{ij} is a function of p_{ij} (maximum at $P_{ij}=0.5$ and decreases as p_{ij} deviates from 0.5 in either direction). Consequently, the variance of p_{ij} will vary from cell to cell depending on the p_{ij} values in the respective cells. One of the assumptions associated with the analysis of variance model is that the error variance is homogeneous (i.e. the variance of $e_{ij.}$ is constant, within statistical limits, among cells). It is noted that the variance of $e_{ij.}$ is a direct consequence of p_{ij}. For example, for a given n_{ij}, if p_{ij} is closed to 0.5, e_{ij} would be subjected to a larger sampling variance than if p_{ij} were closed to 1 or to 0. To overcome this difficulty, the arcsine transformation of p_{ij} (i.e. $\bar{y}_{ij}$ = arcsine $(p_{ij})^{0.5}$) might be used. It is known that this transformation will result in the variance of $\bar{y}_{ij}$ approximately equal to $821/(n_{ij}+0.5)$, whatever the p_{ij} value may be. Furthermore, the distribution of $\bar{y}_{ij}$ tends to normal as n_{ij} increases with mean equal to arcsine $(p_{ij})^{0.5}$ and variance within ± 6% $821/(n_{ij} + 0.5)$ for almost all binomial distributions with $n_{ij}p_{ij}$ equal to or greater than one (Keeping, 1962). Treating y_{ij} as a normally distributed continuous variable, the linear statistical model is $\bar{y}_{ij} = \mu + S_i + G_j + (SG)_{ij} + e_{ij.}$, where $e_{ij.}$ is the random error associated with $\bar{y}_{ij}$, the variance of which is $821/(n_{ij} + 0.5)$. This model can be analysed by the variance analysis. To handle the unequal sample size in the various cells, Yate's (1934) method of weighted squares of means can be used. However, the method suggested can only be regarded as approximate. It may be sufficiently accurate for practical purposed providing that (i) n_{ij} in each cell is not too small, (ii) n_{ij} is not grossly different among cells, and (iii) the p_{ij} values are not too far from 0.5 in either direction.

Alternatively, the data may be analysed as a series of 2 x 2 contingency tables (i.e. one table for each level of the matching variable) and then use Cochran's test (Snedecor and Cochran, 1967). However, Cochran's test does not provide answer to the question concerning interaction between factor under study and matching variable.

Grizzle (1961) developed a method to analyse data of this type by the use of maximum likelihood for the estimation of the various 'effects' and used Pearson's chi-square for hypothesis testing. Since Grizzle's maximum likelihood method involves iterative procedures and is therefore computationally

cumbersome, Berkson (1968) introduced the minimum logit chi-square method. Both the Berkson and Grizzle procedures produce numerically similar results but the Berkson method is considerably simpler computationally. The relative merits of the two methods is discussed by Berkson.

Grizzle, Starmer and Koch (1969) and a series of articles that published subsequently dealt with the analysis of categorical data by linear models. They have noted that the Berkson method is a special case (i.e. 2 x 2 x r) of their much more generalised method and therefore both methods produced numerically identical results. However, the Grizzle-Starmer-Koch analysis requires not only vigorous matrix manipulations but also demands some familarity on the understanding of linear models on the part of the user.

Therefore, from the medical investigator's point of view, Berkson's method is, I think, the most logical choice because of computational simplicity and yet produce results similar to the more cumbersome methods.

Numerical Example

Let us suppose that a case-control retrospective study was undertaken to investigate the possible association between the use of oral contraceptives and thromboembolic disease. Married women patients with thrombosis (cases) were matched for age within a 5-year interval with married women without thrombosis (controls) (Appendix 2). Each subject was then ascertained whether or not she had use oral contraceptives. The basic data generated from this investigation is presented in Table 1. Notations, intermediate statistics and the computation of the three Berkson minimum logit chi-square values are shown in Tables II, III and IV, respectively, while the chi-square test of significance is summarized in Table V.

From Table V, it is found that (i) the percent of oral contraceptive users is significantly different ($p < 0.005$) between the case and control groups, (ii) the percent of oral contraceptive users is not significantly different among different age groups on the whole (Appendix 4), and (iii) there is no statistical significant interaction between the groups (cases and controls) and the age levels of thewomen on the percent of oral contraceptive users (Appendix 5).

TABLE I

Basic Data from a Case-Control Study of Association Between the Use of Oral Contraceptives & Thromboembolic Disease

Age Group	Patients	Oral contraceptive pill user?		Total
		Yes	No	
16-20	Cases	3 (20·0)	12	15
	Controls	14 (18·4)	62	76
21-25	Cases	4 (25·0)	12	16
	Controls	12 (17·6)	56	68
26-30	Cases	6 (26·1)	17	23
	Controls	16 (17·4)	76	92
31-35	Cases	12 (40·0)	18	30
	Controls	22 (20·8)	84	106
36-40	Cases	11 (45·8)	13	24
	Controls	20 (23·8)	64	84
41-45	Cases	7 (46·7)	8	15
	Controls	10 (21·7)	36	46

Values within brackets are percentages

TABLE II

Notation Used for the Computation of Berkon's Minimum Logit Chi-squares

K	Group	Response Variable	
		+	−
1	1	3 (a_1)	12 (b_1)
	2	14 (c_1)	62 (d_1)
2	1	4 (a_2)	12 (b_2)
	2	12 (c_2)	56 (d_2)
3	1	6 (a_3)	17 (b_3)
	2	16 (c_3)	76 (d_3)
4	1	12 (a_4)	18 (b_4)
	2	22 (c_4)	84 (d_4)
5	1	11 (a_5)	13 (b_5)
	2	20 (c_5)	64 (d_5)
6	1	7 (a_6)	8 (b_6)
	2	10 (c_6)	36 (d_6)

K = 1, 2, ..., r. In this example, r = 6

TABLE III

Intermediate Statistics Needed for Berkson's Chi-squares

K	C_{1k}	C_{2k}	$\bar{W}_k$	l_{1k}	l_{2k}	B_k	$\bar{W}_k B_k$	$\bar{W}_k B_k^2$	B'_k	$\bar{W}_k B'_k$	$\bar{W}_k B'^2_k$
1	0·41667	0·08756	1·98322	−1·38629	−1·48808	0·10179	0·20187	0·02055	2·87437	5·70051	16·38537
2	0·33333	0·10119	2·30139	−1·09861	−1·54044	0·44183	1·01682	0·44926	2·63905	6·07348	16·02823
3	0·22549	0·07583	3·31873	−1·04145	−1·55814	0·51669	1·71475	0·88600	2·59959	8·62734	22·42754
4	0·13889	0·05736	5·09554	−0·40546	−1·33977	0·93431	4·76081	4·44808	1·74523	8·89289	15·52014
5	0·16783	0·06562	4·28357	−0·16705	−1·16315	0·99610	4·26686	4·25022	1·33020	5·69800	7·57949
6	0·26786	0·12778	2·52755	−0·13353	−1·28093	1·14740	2·90011	3·32759	1·41446	3·57512	5·05686
Σ	1·55007	0·51534	19·51000	−4·23239	−8·37051	–	14·86120	13·38170	–	38·56734	82·99763

$C_{1k} = \frac{1}{a_k} + \frac{1}{b_k}$ $\quad l_{1k} = l_n(a_k) - l_n(b_k)$

$C_{2k} = \frac{1}{c_k} + \frac{1}{d_k}$ $\quad l_{2k} = l_n(c_k) - l_n(d_k)$

(Appendix 3)

$\bar{W}_k = \frac{1}{C_{1k} + C_{2k}}$ $\quad B_k = l_{1k} - l_{2k}$ $\quad B'_k = l_{1k} + l_{2k}$

TABLE IV

Computation of Berkson's Chi-square Values

Interaction	Cases vs. Controls	Age
$\chi^2 = \sum_{k=1}^{r} \bar{W}_k B_k^2 - \hat{\beta}^2 \sum_{k=1}^{r} \bar{W}_k$	$\chi^2 = 0.25\,(\bar{C}_t \lambda^2)$	$\chi^2 = \sum_{k=1}^{r} \bar{W}_k B'^2_k - \hat{\beta}'^2 \sum_{k=1}^{r} \bar{W}_k$
Where $\hat{\beta} = \sum_{k=1}^{r} \bar{W}_k B_k \Big/ \sum_{k=1}^{r} \bar{W}_k$	Where $\bar{C}_t = \sum_{k=1}^{r} C_{1k} + \sum_{k=1}^{r} C_{2k}$	Where $\hat{\beta}' = \left(\sum_{k=1}^{r} \bar{W}_k B'_k\right) \Big/ \sum_{k=1}^{r} \bar{W}_k$
$= 14·8612/19·51000 = 0·76172$	$= 1·55007 + 0·51534$	$= 38·56734/19·51000$
	$= 2·06541$	$= 1·97680$
$\therefore \chi^2 = 13·38170 - \left[(0·76172)^2 \times 19·51000\right]$	$\lambda = 2\left(\sum_{k=1}^{r} l_{1k} - \sum_{k=1}^{r} l_{2k}\right) \Big/ \bar{C}_t$	$\therefore \chi^2 = 82·99763 - \left[(1·97680)^2 \times 19·51000\right]$
$= 2·06$	$= 2\left[-4·23239 - (-8·37051)\right] \Big/ 2·06541$	$= 6·76$
With $(r-1) = 5$ degrees of freedom	$= 4·00707$	With $(r-1) = 5$ degrees of freedom
	$\chi^2 = 0·25 \times \left[2·06541 \times (4·00707)^2\right]$	
	$= 8·29$ with 1 degree of freedom	

TABLE V

Summary Table Showing the Chi-square Tests of Significance

Source	Degrees of Freedom	Chi-square
Cases vs Control	1	$8 \cdot 29^{**}$
Age	5	$6 \cdot 76^{ns}$
Interaction	5	$2 \cdot 06^{ns}$

** = Highly significant ($p < 0 \cdot 005$)

ns = Not significant ($p > 0 \cdot 05$)

APPENDIX

(1) The Pike-Morrow method should be very useful in the case-control retrospective study of rare diseases (i.e. the cases are difficult to find but the matched-controls are readily available). Thus, to study the possible association between the exposure to diagnostic X-ray during the pregnancy of the mother and leukaemia in children, the cases (laukaemic children) would be first located, and a number of controls (children without leukaemia) would then be matched to each case. The matching variables might be the sex and age of the child. Note that the number of controls need not be the same for each case. From each of the case and control children, we then ascertain whether or not the mother had been exposed to X-ray during her pregnancy.

The McNemar test is a special case of this method. That is, when one control is matched with one case, both methods produced identical numerical results. I have worked out some numerical examples of the Pike-Morrow test.

(2) In any case-control study, the investigator can use either one of two sampling schemes, depending on the availability of the cases. If the cases are relatively difficult to locate, the investigator may want to select a sample of cases first, then the control subjects are selected in order to match with the cases. But if both the cases and controls are readily available, the investigator might select both samples simultaneously and then construct the matched sample with the subjects so selected. The relative merit of these two sampling schemes is briefly discussed in Althauser and Rubin (1970).

I might also point not that matching does not necessarily have to be done at the sampling stage. Matching (or stratification) can also be done at the analysis stage (i.e. after the data have been collected). A possible danger of this approach is that if the distribution of the matching variable in the two samples obtained is grossly different, the samples cannot be matched. For example, if the age of the 'cases' selected ranges from 31 to 42 while that of the 'controls' ranges from 20 to 30, then obviously we cannot match the two samples for age.

(3) When a value (i.e. a_k) is zero, its natural logarithm (1_n) is $-\infty$ and therefore the 1_{jk} value cannot be obtained. In such a case, replace the zero value by 0.5.

(4) Obviously this finding has no relevance to the objective of the investigation. However, had the investigation been a prospective one, then the finding would be of relevance (i.e. effect of age on the percent of cases).

(5) For a more thorough discussion on the meaning of statistical interaction, see Snedecor and Cochran (1967) or Armitage (1971). But briefly, it is this: If the percent of oral contraceptive pill users (Y-axis) is plotted against the age groups (X-axis) for the cases and for the controls, then interaction would result in two non-parallel lines.

Now, upon looking at the following table, the reader may wonder why interaction was not statistically significant.

It is apparent that the two lines diverge in the direction of older age groups. However, if we consider the 95% confidence limits (i.e. allowing for sampling errors) of the respective percentages, we see that most of them overlapped.

	CASE						CONTROL					
Age	16–	21–	26–	31–	36–	41–	16–	21–	26–	31–	36–	41–
% BC pill users	20.0	25.0	26.1	40.0	45.8	46.7	18.4	17.6	17.4	20.8	23.8	21.7
95% CL	4.4– 47.6	7.3– 52.0	10.5 47.8	23.0– 59.0	26.0– 67.0	21.0– 73.0	10.8– 28.6	9.5– 28.7	10.8– 26.4	13.5– 29.6	15.2– 34.4	10.8– 36.2

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Results of a modified Transvesical Prostatectomy — A Review of 100 cases

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Operations for benign enlargement of the prostate are common in all the General Hospitals of the country. There has been no review of the results of operative treatment for enlarged prostates. The present study is an evaluation of 100 consecutive cases of a modified transvesical prostatectomy done in the Department of Urology and Nephrology at the General Hospital, Kuala Lumpur between the years May 1970 and May 1974.

Mode of Presentation

Patients age ranged from 50 to 90 years with an average age of 66.3 years. The community distribution is shown in Table I.

TABLE I

COMMUNITY DISTRIBUTION		
Chinese		42
Malays		26
Indians		29
Others		3

The patients presented with a variety of symptoms. Seventy of the one hundred patients presented with acute retention and nineteen with haematuria The others had symptoms of prostatism. Many of these patients had been catheterized either by their General Practitioners or in another hospital. Some of the patients had catheter drainage of the bladder for over two weeks.

Amongst associated diseases, vesical calculi was the most common. The other associated diseases are listed in Table II.

TABLE II

ASSOCIATED DISEASES		
Urinary calculi		23
Lung diseases		20
Diabetes mellitus		14
Hypertension		10
Ischaemic Heart disease		8
Hernia		8
Haemorrhoids		7
Epididymo-orchitis		2
Duodenal ulcer		1

Three patients required vesicolithotomy, while another three had suprapubic cystostomy because of false passage in the urethra caused by attempted dilatation and catheterization prior to admission to the Urology ward.

Paper presented at the 9th Malaysia Singapore Congress of Medicine

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Method

A patient was considered suitable for open prostatectomy if the gland was estimated by rectal examination to weigh more than 40 gms. In a few cases the rectal examination was found to be incorrect and the prostate at operation was much smaller. Transvesical prostatectomy was also preferred in cases where a patient had a small calibre urethra, urethral stricture and large bladder stones.

The following routine preoperative investigations were carried out haemoglobin, urine culture, blood urea, serum acid phosphatase, plain abdominal X-ray, chest X-ray and electrocardiogram. In some of the patients serum creatinine, intravenous pyelogram and panendoscopy were also done. Patients with associated medical diseases were referred to the medical unit. Postoperative antibiotics was given to all patients.

Spinal anaesthesia is the anaesthetic of choice in the Unit, but some patients were operated under general anaesthesia. Spinal anaesthesia gives better muscular relaxation and there was less operative and post-operative bleeding.

The operative procedure is basically a Wilson Hey transvesical prostatectomy (1). The Pfannenstiel skin incision was made in the majority of patients, but in some the midline incision was used. The bladder was opened and after the mucosa over the adenoma was incised with diathermy the gland was enucleated. Tissue tags were excised with diathermy and the prostatic fossa packed with a roller gauze. From May 1970 the senior author had modified the procedure for haemostasis and reconstruction of the prostatic bed by suturing the torn mucosal membrane of the bladder to the posterior prostatic capsule. Plain catgut sutures are commenced from the 6 o'clock position. On the left side the continuous suture is applied up to the 9 o'clock position. Using a new suture and again commencing from the 6 o clock position, a similar continuous suture was applied up to the 3 o'clock position (Fig 1).

Other bleeding points in the anterior part of the bladder neck were coagulated or sutured. Good haemostasis was obtained by this technique, thus reducing operative blood loss. A F22 Foley urethral catheter was introduced and the balloon blown up to 15 to 20 ml and traction applied on the catheter while the bladder was closed. The bladder was closed with 2 layers of catgut after leaving a DePezzer cystostomy tube through a stab wound

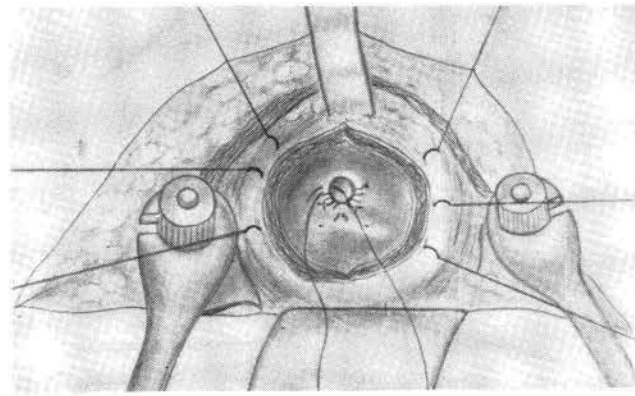

Fig. I

in the dome of the bladder. A Penrose drain was placed in the space of Retzius and the abdominal wound was closed in layers. No vasectomy was done on our patients.

Postoperatively, continuous bladder wash out was done via a closed irrigation system using normal saline. After 24 hours when the bleeding had decreased, both catheters were connected to closed bed side drainage systems and the cystostomy tube was removed four to six days postoperatively. If there was no suprapubic urinary leakage over the next two or three days, the urethral catheter was removed. The Penrose drain from the space of Retzius was removed two days after the removal of the suprapubic catheter.

75 patients were operated under spinal anaesthesia, while 25 were done under general anaesthesia.

No direct measurement of blood loss was carried out. The transfusion rate can be considered a crude assessment of total blood loss. 89 patients required blood transfusion and the average amount of blood used was 1.3 pints per patient. Most patients required one pint each while two patients required four pints as shown in Table III.

TABLE III

TRANSFUSION RATE		
No blood required		11
1 pint		56
2 pints		26
3 pints		5
4 pints		2

During prostatectomy eight patients had vesical calculi removed, one patient required a ureterolithotomy, one required a diverticulectomy and another required a circumcision.

The weight of the glands removed ranged from 10 gms to 150 gms with an average 45.6 gms. This compares favourably with the recent series by Nicoll (2). Four of the glands were reported as containing foci of adenocarcinoma while the rest were reported as benign prostatic hyperplasia.

Post-operative complications

Post-operative stay ranged from 8 - 38 days with an average of 16.8 days. Prolonged suprapubic leakage and wound infection were the most common causes for prolonged hospital stay. Table IV lists the early post-operative complications.

TABLE IV

Early Post-operative Complications		
Prolonged suprapubic leakage		40
Wound infection		24
Impaired control of voiding		15
Epididymo-orchitis		10
Prolonged haematuria		7
Secondary haemorrhage		7
Septicaemic shock		4
Paralytic ileus		2
Inability to void		2
Mental confusion		2

The four patients with septicaemic shock were successfully treated with hydrocortisone and gentamycin. Patients with very severe haematuria and secondary haemorrhage required endoscopic or open clot evacuation and blood transfusion. None of them had any blood coagulation defects. Table V shows the late post-operative complications.

TABLE V

Late Post-operative Complications	
Urethral stricture	2
Contracted bladder neck	2
Meatal stenosis	1
Incisional hernia	1

Results

Mortality rate was one percent in this series (1 death in 100 cases) and death in this case was due to myocardial infarction on the second day. 90 patients came back to our clinic for follow-up and follow-up period ranged from six weeks to one year, with an average of three months. Most complained of nocturia and dysuria in the early weeks and about 60 percent had pyuria for up to three months. As seen in Table V late post-operative complications were very few. 85 patients said that they had a good voiding stream.

Discussion

The modified technique of suturing the bladder mucosa to the prostatic capsule has been found to reduce blood loss. Average blood transfusion rate was only 1.3 pints. It is felt that the suturing of the prostatic capsule to the bladder mucosa establishes physiological continuity of the prostatic urethra and this has contributed not only to a good urinary stream but also to a very minimal number of cases of urethral stricture at the bladder neck.

Poor wound healing, infection and prolonged suprapubic leakage occurred most commonly in diabetic and very elderly patients. There was high incidence of secondary haemorrhage, epididymo-orchitis, and septicaemia in patients who were on prolonged catheter drainage prior to operation. The most common and dreaded gram-negative organisms that were cultured were Pseudomonas and Proteus which fortunately were controlled with the use of gentamycin. Recently, though, some resistant strains of Pseudomonas have been cultured.

The patient who had an incisional hernia had a suprapubic midline skin incision. None of the patients who had a Pfannenstiel skin incision developed incisional hernia.

Only two patients developed urethral strictures which were situated in the penile urethra and at the penoscrotal junction. One required urethrostomy while the other stricture was easily dilated. One patient developed meatal stenosis for which a meatotomy was done. The incidence of urethral strictures and contracted bladder neck following transurethral resection of the prostate is 5 percent (3).

Although 15 patients had impaired control of voiding in the post-operative period following removal

of catheter and in the early follow-up period, none of them developed true incontinence. They all improved with perineal and sphincteric exercises. After transurethral resection a small percentage (4 percent) may develop true incontinence when the external sphincter is damaged (4).

Summary

A review of 100 cases of transvesical prostatectomy using a modified technique for the reconstruction of the prostatic floor after enucleation of the prostate is presented.

Post operative complication, the length of hospital stay, and the long term follow up of these cases is discussed.

Transvesical enucleation of the prostate with suture of the bladder neck to the prostatic capsule is shown to be a safe and an effective method for dealing with benign enlargement of the prostate.

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X-Ray Diagnosis in Urinary Tract infection

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INTRODUCTION

Since repeated upper urinary tract infection may be due to underlying abnormalities, simple radiological techniques play an important role in diagnosis as summarised in Tables I, II, and III, and illustrated by radiographs taken over a four months period (November 1974 to February 1975) at District Hospital, Taiping.

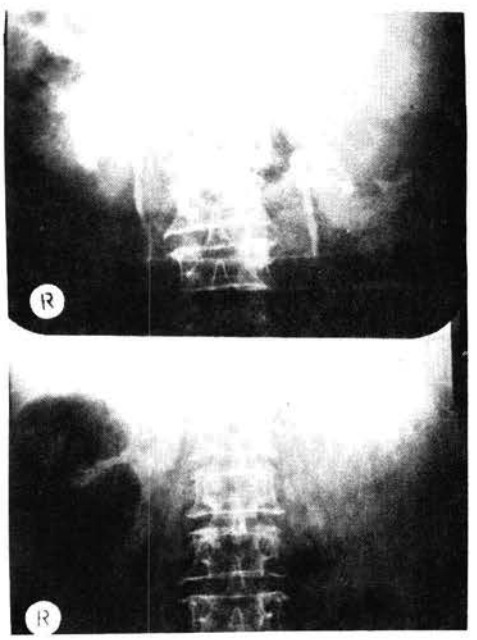

Fig: 1

Dystrophic Calcification in (L) Hypernephroma Destroying and Displacing Calyces.

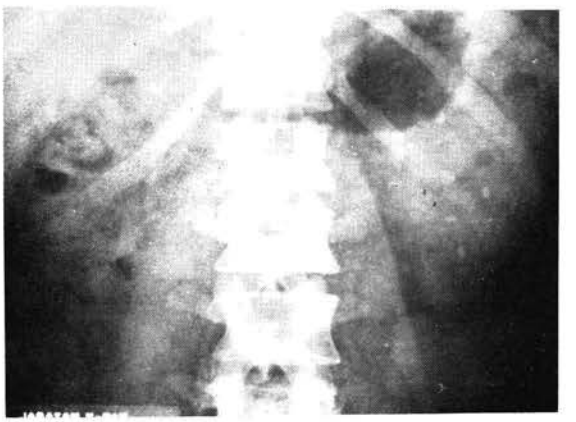

Fig: 2

Large (L) Kidney (Medullary Sponge) With Pyramidal Nephrocalcinosis.

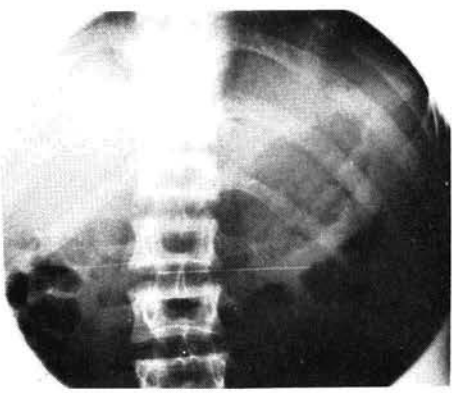

Fig: 3

Bilateral Nephrocalcinosis in Kidneys of Normal Size. Codfish Vertebrae

Fig: 4

(L) Staghorn Calculus>Bone Density
(R) Faceted Gall Stones (Similar appearance in Calyceal Diverticulum)

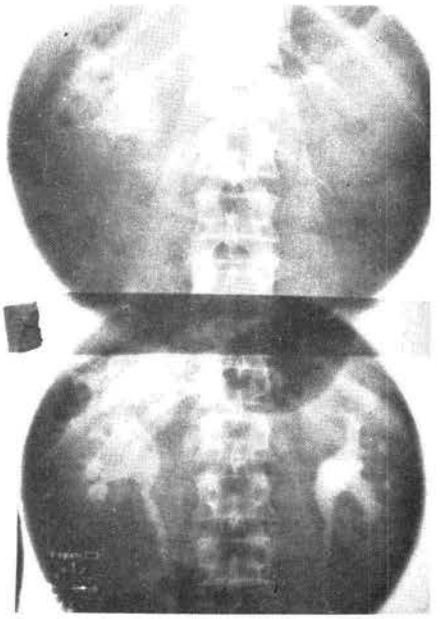

Fig: 5

(R) Staghorn Calculus<Bone Density

TABLE I

STONES AND BONES

PLAIN X-RAY ABDOMEN

NEPHROCALCINOSIS

Cortical — Acute cortical necrosis and chronic glomerulonephritis.

Medullary

1) Hyperparathyroidism — Small kidney size
2) Renal Tubular Acidosis — Normal " "
3) Medullary Sponge Kidney — Large " "
(often unilateral)
4) Oxalosis

CALCULI

	Opaque	Non-Opaque
1) Staghorn.		
(a) Density greater than bone	= Phosphate	1) Uric Acid
(b) Density less than bone	= Cystine	2) Xanthine
2) Oval		
(a) Smooth	) Silicon Dioxide (From excess Magnesium Trisilicate)) Calcium Phosphate	
(b) Spiky	Calcium Oxalate	
3) Faceted	Calyceal Diverticulum	
4) Milk of Calcium	(a) Calyceal Diverticulum. (b) Hydronephrosis.	

DYSTROPHIC CALCIFICATION.

1.	(a) Papillary Necrosis	(b) T.B.	(c) Hydatid
2.	(a) Haematoma	(b) Infarct	(c) Amyloid
3.	(a) Cyst	(b) Carcinoma	
4.	Prostatic		

OSTEOMALACIA

1) Codfish Vertebrae
2) Bowing.
3) Looser's Zones
e.g. pubic rami, ribs, long bones, lateral scapula.

RENAL OSTEODYSTROPHY

Sandwich or Rugger Jersey Spine.

HYPERPARATHYROIDISM

Pepper Pot Skull and Loss of Lamina Dura of Teeth and Dorsum sellae

Primary	Secondary
1) Brown Tumours/Cysts/Transradiancies e.g. Pelvis, Long Bones, Skull.	1) Subperiosteal, Subchondral and Subtendinal Resorption. e.g. Phalanges, Sacroiliac joints, Pubic Symphysis, Proximal Femur and Humerus, outer end of Clavicle.
2) Metastatic Calcification. e.g. Chondrocalcinosis, lungs, skin.	2) Metastatic Calcification. e.g. Vessels.

NEUROSPINAL LESIONS.

1) Spina Bifida
2) Meningomyelocole
3) Diastematomyelia.
(Calcified spur and widened interpedicular distance)

TABLE II

SCARS AND BARS

I. V. U.

CORTEX

IRREGULAR CONTRACTION.

1) Poles — Chronic Pyelonephritis
2) Middle — Infarct

3) Indefinite — Trauma, T.B.

SMOOTH CONTRACTION. — ISCHAEMIA; POST OBSTRUCTIVE. PAPILLARY NECROSIS.

CALYCES

1) Uniform Ballooning — Post Obstructive
2) Irregular — Chronic Pyelonephritis
3) Excavation — T.B. Papillary Necrosis

URETERS.

1) Retrocaval — Sudden medial deviation
2) Retroperineal Fibrosis
3) Diverticulae
4) Filling Defects
5) (a) Ureterocoele (b) Megaureters.
6) Fistulae from bowel
7) Strictures e.g. Tuberculosis, Trauma, Radiation, Malignancies.

NEPHROGRAM

DIRECT (Chronic)		INDIRECT (Acute)
1) Rims & Transradiancies	— Polycystic.	1) Increasing Density. — Acute Obstruction — Severe underperfusion e.g. Hypertension. ischaemia, A.G.N.
2) Soap Bubbles & Cresents	— Hydronephrosis.	
3) Round Transradiancy & Claw	— Cyst	
4) Vasular Dense Nephrogram Then Transradiant area.	— Tumour	2) Persistent Density. — A.T.N. — Acute Suppurative Pyelonephritis.
5) Isthmus	— Horse shoe kidney	
6) Nil	— Congenital Multicystic Kidney Xanthogranulomatous Pyelonephritis.	3) Faint. — Infarction — C.G.N. — Bilateral Cortical Necrosis. — Phenindione Nephritis
7) Perihilartransradiancy	Fibrolipomatosis.	

PYELOGRAM.

1) (a) Tubular Ectasia — Medullary Sponge Kidney
   (b) Medullary opacification in infants — Medullary Necrosis
2) Drooping Flower — Duplex
3) Filling Defects (a) Lumen — Sloughed papillae, papilloma, stones. clots, fungus ball.
   (b) Wall — Pyeloureteritis Cystica, Carcinoma.
   (c) Extrinsic — Anomalous vessels — Cysts, Tumours.
4) Mucosal striation — recent obstruction & infection; reflux
5) Hydrocalicosis — congenital valves or Achalasia Nephrogenic Diabetes Insipidus
6) Extravasation — acute renal colic.

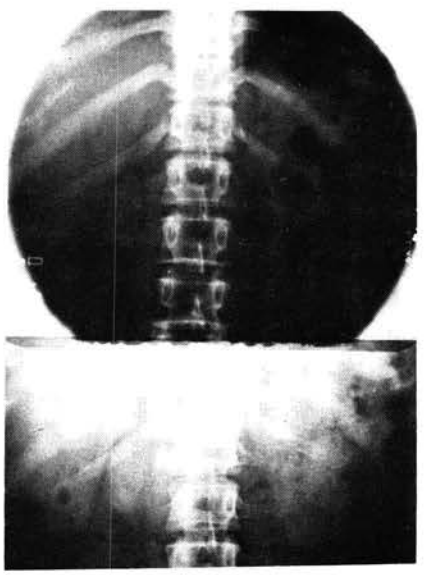

Fig: 6
(R) Ischaemic Smooth Contracted Kidney

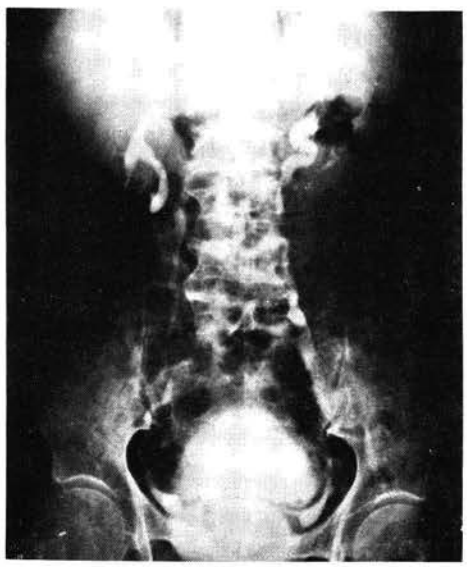

Fig: 7
Vesical Calculus Bladder Diverticulum and Post Obstructive Atrophy Both Kidneys.

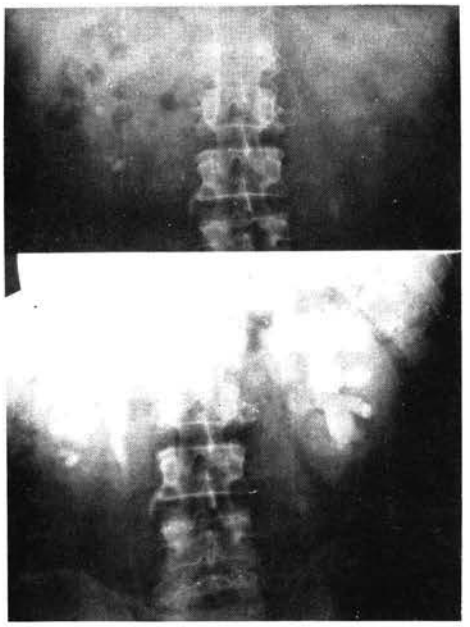

Fig: 8

Papillary Necrosis
(R) Calyceal Excavation and papillary calcification
(L) Hydronephrosis due to Calculus

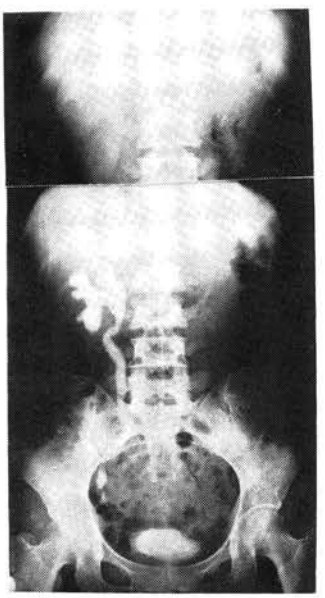

Fig: 9

(R) Hydronephrosis due to TB stricture lower ureter. Irregular Contracted poorly functioning (L) Kidney.

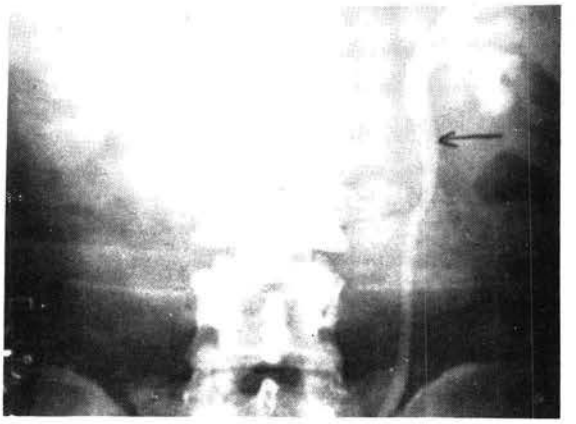

Fig: 10

Calculus (Bar Shape)
Filling Defect. (L) ureter arrowed.

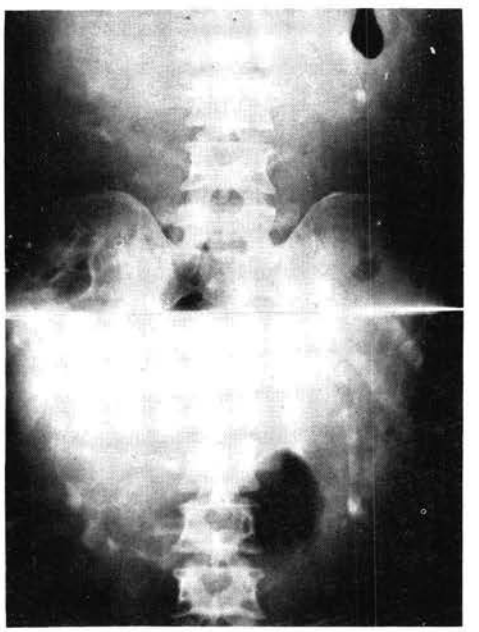

Fig: 11

Bilateral Polycystic Kidneys
Upper– Rim Nephrogram
Immediate film
Lower– Stretched "Spider" Calyces in 4 hour (delayed) film.

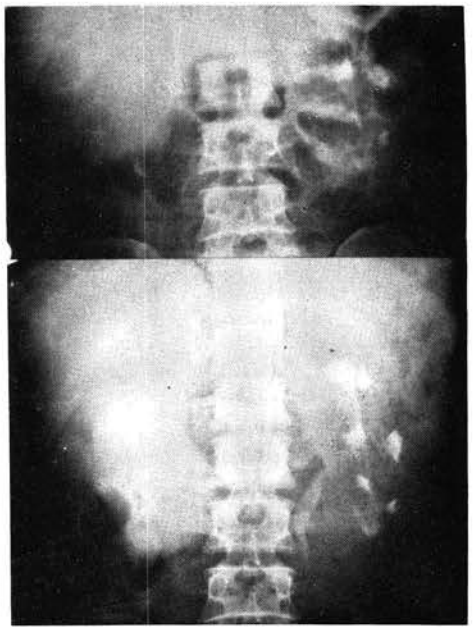

Fig: 12

Upper Cresents with transradiant areas on Nephrogram after double dose.
Lower– (R) Hydronephrosis on 24 hour film.

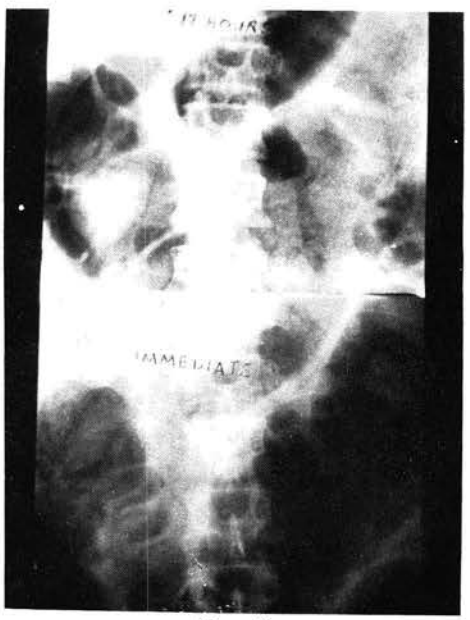

Fig: 13

Right– Dense Persistent Nephrogram (ATN)
Left– Increasing Density of Nephrogram
Blood Urea 185mg% (Ischaemia)

Fig: 14

Traumatic (R) Lower Pole Cyst with "claw sign" of Nephrogram

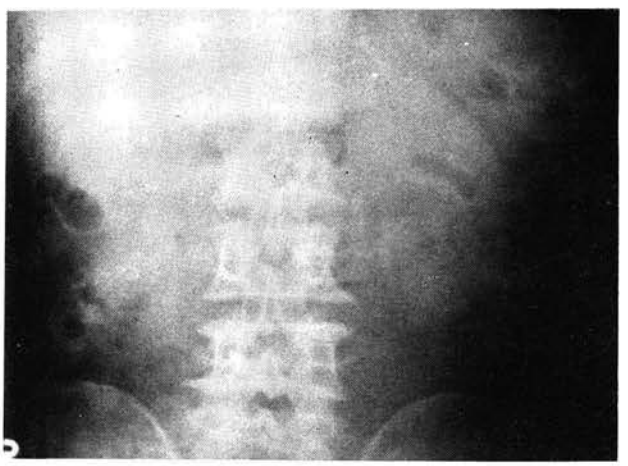

Fig: 15

Severe Renal Failure with excretion of contrast into bowel (24 hour film)

TABLE III

STASIS AND BASIS

MICTURATING CYSTO–URETHROGRAM.

Children	All Ages.	WOMEN.	
1) Reflux	1) Diverticulae	1) Pregnancy	) Due to hormonal, Uterine pressure
2) Urethral Valves	2) Pelvic Tumours	2) Pill	) and especially (R) iliac vessels.
	3) Neurogenic		
	4) Stricture	MEN	
		Prostate.	

Discussion

Maximum diagnosis without resort to repeat investigation and often without any need for fasting preparation (in urgent cases) and compression can be ensured by the new technique of *Intravenous Urography* based on renal physiology since modern contrast media are excreted by glomerular filtration.

Urine Concentration (U) X Urine Volume (V) = Plasma Concentration (P) X Glomerular Filtration Rate (G.F.R)

$\therefore U \propto P \propto I/V \propto G.F.R$

Thus maximum urinary concentration is obtained by high plasma levels from rapid injection of high doses 300 mg Iodine/Kg Body Weight equivalent to 1 ml/Kg of contrast medium (Double Dose plus tomogram and no dehydration of patient if blood urea/creatinine raised) has been found to be the best because higher doses produce:–

(1) Hardly any improvement in radiographic contrast.

(2) Denser nephrogram may obscure calyces.

(3) Pyelogram may be less dense due to osmotic diuresis especially with meglumine as cation.

(4) Increased incidence of side effects.

Rapid injection is also important so that an immediate film can be taken for the nephrogram (uniform opacification of kidney due to proximal tubule effect) which is particularly useful in renal failure. The pyelogram appears later and is best seen at 10 minutes. The full length film followed by an after micturition radiograph are then taken – the latter may be helpful in showing up filling defects in the bladder.

Besides the usual bladder view a further view *(The perineal shot)* with the tube tilted 30° cephalad and centered 2 inches below the top of the pubic symphysis, demonstrates prostatic size during urography.

Due to the high incidence of reflux causing scarring and acending infection in children, they should all have micturating cystourethrograms. This procedure should also be done in adults with renal scars and dilated ureters (more than 7 mm width).

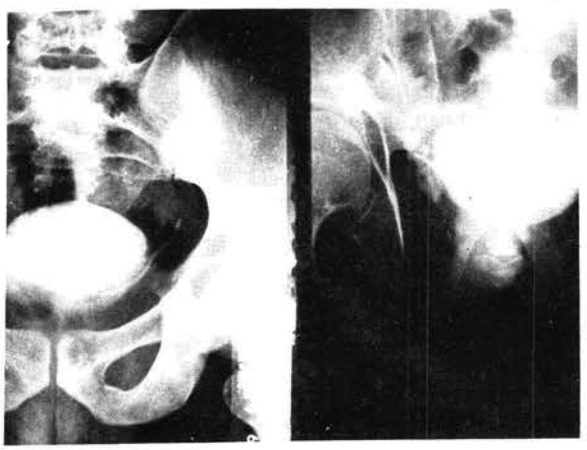

Fig: 16

Perineal shot – Normal: Convex Downwards

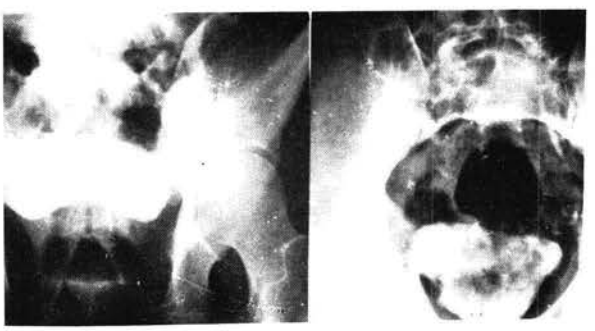

Fig: 17

Prostatic Impression Only Shown On Perineal Shot.

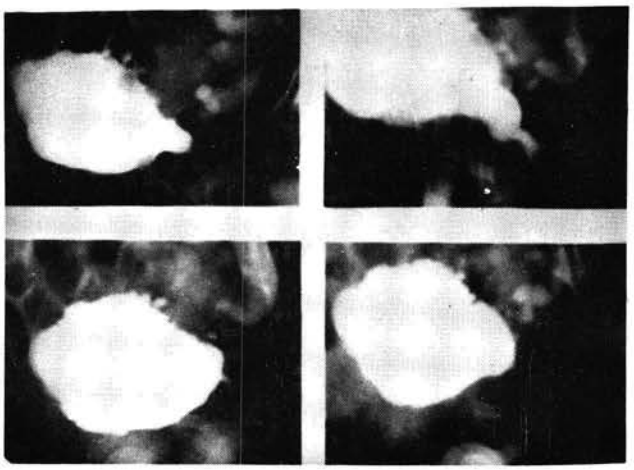

Fig: 18

Micturating Cystourethrogram shows urethral obstruction, trabeculated bladder, reflux up left ureter.

Fig: 19

Molar Pregnancy
Dilated (R) Collecting System
Duplex (L) " "

Acknowledgements

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Certain aspects of Hystero-Salpingography

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SUMMARY

A Review of 129 cases of Hysterosalpingography (HSG) performed during the 5 year period (1969 – 1973) in the Hospital Bersalin, Kuala Lumpur, disclosed that the main indication was for infertility investigation. Fourteen patients conceived within one year after HSG. Two cases of complications were noted.

The application of HSG, its diagnostic and possible therapeutic value in infertility, its pitfalls in diagnosis and its potential complications are discussed and the available literature reviewed.

INTRODUCTION

Hysterosalpingography (HSG) was initially introduced as a method for evaluating the tubal factor in infertility. With the passage of time its indications have increased, and to-day HSG has become an integral part of gynaecological diagnosis.

As early as 1909 Nemenow suggested the Introduction of Lugol's iodine into the uterine cavity to obtain an x'ray picture of this organ. In 1914 Rubin and Cary introduced an approach more closely related to the current method of HSG – using Collargol as contrast medium to demonstrate tubal pregnancy. Kennedy, (1923) suggested the use of HSG for locating the site of tubal obstruction prior to salpingotomy. Since then many papers on the various diagnostic possibility of HSG and the information obtainable by this method of examination have been published. (Ko Chi San. 1948), (Rozin, 1954) (Rozin 1956), (Poidevin 1962).

MATERIAL AND METHOD

All recorded cases of HSG performed in the Obstetric and Gynaecology Department, General Hospital. Kuala Lumpur, during the five-year period (1969–1973) were included in this study. The infertility cases in this series were required to satisfy the following conditions:–

1. Both husband and wife are healthy.
2. Seminal assay of the husband is within normal limits.
3. No apparent organic cause of infertility present.

The HSG was performed in the intermenses phase of the cycle – between the 5th day after cessation of bleeding and the week before the expected menses. Before the HSG was performed a detail menstrual history was taken, a complete pelvic examination done and pelvic infection excluded.

The procedure was performed under strict aseptic condition. The contrast medium used was Diagnol viscous (40% solution of sodium actrozoate with dextran). All patients were given premedication with pethidine 50mg. intramuscularly half an hour prior to the procedure.

The patient was put in lithotomy position and a pelvic examination done. The vagina was retracted with a Sim's speculum and the anterior lip of the cervix held with a pair of volsellum forceps. A cannula through which the contrast medium was to be injected was screwed to fit snugly into the cervical canal. The syringe containing 10 ml. of the contrast medium was attached to the cannula. The Sim's

*A Study project carried out by Dr. Lim Thin Peng during his tenure as House Officer in the Department from 7.5.74 to 6.11.74.

speculum was then removed leaving the cannula and syringe in situ. The patient's legs were lowered to allow a supine position. The contrast medium was then injected. The amount and the rate at which the medium was injected into the uterine cavity was guided by visualising the uterine and tubal filling under fluoroscopy. Selective films were taken when required. No delayed film was taken and the patient allowed home half an hour later if there were no immediate complication.

RESULTS

Applications of HSG and their findings:

A total of 129 cases of HSG performed during the period 1969 to 1973 were included in this analysis. The indications are shown in table I.

Table I

Indications of HSG

Indications	No of cases
Primary infertility	76 (58.8%)
Secondary infertility	41 (32.0%)
Recurrent abortion	3 (2.3%)
IUCD translocation	3 (2.3%)
Others	6 (4.6%)
Total	129 (100%)

The commonest indication for HSG in our series was for infertility investigation (90.8%). Of these primary infertility constituted the larger portion with 76 cases (58.8%) and 41 cases (32%) were for secondary infertility. Three cases of recurrent abortion, three cases of suspected intrauterine contraceptive device (IUCD) translocation and 6 cases of other gynaecological problems were also investigated.

Of the 6 gynaecological problems three were for investigation of tubal patency after gynaecological operation:– one post-abdominal tubal ligation, one post-salpingectomy for ectopic pregnancy and another post-tuboplasty. The other 3 cases consisted of:– one suspected perforated uterus after dilatation and curettage (D. & C.), one suspected congenital malformation of the uterus and one suspected dehiscence of old Caesarean scar following an assisted breech delivery. The HSG findings are shown in table II.

Table II

Hystero-salpingography findings

Findings \ Indications	1° infert.	2° infert.	Recur. abort.	others
Patent	40	17	3	7
Unilateral occlusion	10	4		1
Bilateral occlusion	26	20		1
Bicornuate uterus	1	–		1
Intrauterine mass	5	–		–
IUCD in uterine	–	–		3
Hydrosalpinx	1	3		–
Cervical incompetence	–	–	1	–

Forty of the 76 cases done for investigation of primary infertility showed normal tubal patency, 10 with unilateral tubal occlusion and 26 with bilateral tubal occlusion. In addition, 5 cases had films suggestive of uterine fibroid (intrauterine mass) and one showed hydrosalpinx. Seventeen of the 41 secondary infertility cases had normal tubal patency, 4 with unilateral occlusion and 20 with bilateral occlusion. Cervical incompetence was reported in one of the 3 recurrent abortion cases whereas the other 2 cases had normal HSG. The HSG of all 3 cases suspected of translocation showed that the IUCD were within the uterine cavity.

Duration of infertility prior to HSG (table III).

Fifty percent of the primary infertility cases were investigated after 3 – 5 years of involuntary infertility, 26% after more than 5 years and 24% after only 1 – 2 years. Of the secondary infertility cases 30% were investigated after more than 5 years of involuntary infertility, 32% after 3 – 5 years and 29% after only 1 – 2 years.

Table III

Duration of involuntary infertility

Years	Primary infertility		Secondary infertility	
	Total No. of cases	Cases eventually preg.	Total No. of cases	Cases eventually preg.
1 – 2	18 (24%)	5	12 (29%)	2
3 – 5	38 (50%)	4	13 (32%)	–
5 – 7	20 (26%)	1	16 (39%)	2
Total	76 (100%)	10	41 (100%)	4

Correlation of HSG and Tubal insufflation findings:

Not all the cases of infertility had both tubal insufflation (TI) and HSG performed. There was a period of a few months when the tubal insufflator was under repair. The correlation of HSG and TI findings are shown in table IV. Only 73 of these cases of infertility had TI done prior to HSG.

Table IV

Hystero-salpingography / Tubal Insufflation	Both tubes patent	Unilat. tubal block-age	Bilat. tubal block age or spasm of tubes	Total
Both tubes patent	14	3	8	25
Unilat. tubal blockage	1	1	4	6
Bilat. tubal blockage/ spasm of tubes	16	7	19	42
Total	31	11	31	63

Out of these only 34 cases (47%) had diagnostic findings for tubal patency indentical in both procedures.

Pregnancy after HSG

The follow-up of infertility cases after HSG in this series was poor. Quite a number of patients defaulted after one or two subsequent visits and many never returned after they were informed of the HSG findings. As such how many of these patients eventually become pregnant was impossible to assess. The number of known pregnancies after HSG is shown in table V.

Table V

Pregnancy after HSG

Interval (months)	Pri. infertility	Sec. infertility	Total
0 - 3	6 (2)	4 (2)	10 (4)
4 - 9	2 (2)	—	2 (2)
10 - 12	2 (2)	—	2 (2)
14 - 24	10 (6)	4 (2)	14 (8)

(Cases with tubal insufflation done prior to HSG shown in parenthesis).

Among the group who were followed up, 14 eventually conceived. 10 within 3 months: 2 within 4 – 9 months and 2 within 10 – 12 within after the HSG. Eight of them had tubal insufflation prior to HSG. Of these 14 cases 7 had voluntary infertility for a period of 1 – 2 years, 4 for 3 – 5 years and 3 for more than 5 years (Table III). It is of interest to note that 3 of the 14 cases who became pregnant were reported to have bilateral tubal occlusion. The outcome of these fourteen pregnancies were difficult to trace in retrospect as these were referred to the Ante-natal Clinics and became part of a very large patient population involving more than 24,000 outpatient visits per annum.

Complications

Two cases of mild complications due to HSG were recorded. One patient developed severe abdominal pain soon after HSG. The pain lasted for 2 days but it responded to symptomatic treatment. Another patient had slight bleeding from the cervix traumatised during the insertion of the cannula. A woman who conceived after her tubes were previously ligated had HSG done inadvertently for investigation of tubal patency and she aborted 2 weeks after the procedure.

DISCUSSION

Application of HSG

The most important application of HSG is in the diagnosis of pathological conditions of the fallopian tubes in cases of infertility. With the aid of fluocroscopy the whole process of tubal filling, tubal passage and tubal evacuation may be clearly visualised and the peristaltic movement of the tubes observed. Tubal occlusion can be precisely diagnosed and localised by HSG and salpingography findings may be decisive in determining the management in cases of partial or complete tubal occlusion. Peritubal adhesion and the presence of tubal distortion and displacement can be revealed by salpingography. Hysterosalpingography has also been attributed to have therapeutic effects in cases of partial tubal occlusion due to flimsy adhesions.

Hysterosalpingography is a valuable method in detecting some of the causes of repeated abortions. Rozin (1965) reported a series of 200 consecutive and unselected cases of HSG performed in women who had two or more spontaneous abortions. The HSG revealed uterine fibroma in 27 cases, congenital

malformation in 25 cases, intrauterine filling defects in 26 cases and other uterine anomalies in 10 cases, thus, revealing a possible cause of repeated abortion in almost half of all the cases. The other possible causes of repeated abortion detectable with HSG are fixed retroverted uterus and cervical incompetence.

When translocation of intra-uterine contraceptive device is suspected, HSG is the method of choice for detecting the IUCD presence in the uterine cavity. When such indication is present it is better to use a small volume of contrast medium (1–1.5 ml.) since large volume may obscure the IUCD shadow.

Malformation of the uterus may present as a case of infertility, menstrual disorder, repeated abortion, premature labour or obstetric complication. Hysterosalpingography aids in the diagnosis in such conditions and its findings may provide an additional basis for classification of congenital malformation of the uterus.

Hysterosalpingography is one of the most valuable and accurate methods for detecting the submucous myomata. (Rozin, 1956). It gives information on the localisation and size of the tumour and the distortion of the uterine cavity. It may serve as a guide in the choice of hysterectomy or myomectomy especially in patients of borderline age group. In cases of menstrual disturbance which repeated curettage has failed to reveal any pathology, HSG may be helpful in revealing a missed endometrial polyp. The percentage of accurate preoperative clinical diagnosis of adenomyosis is between 2.6 – 4.3% (Israel, 1956) and Hysterosalpingography may help in increasing the accuracy.

External and internal genital fistula are difficult to diagnose clinically and are usually diagnosed accidentally while performing HSG.

The diagnosis of genital tuberculosis is difficult because there are no specific clinical symptomatology apart from infertility. In old chronic cases, however, HSG may give a characteristic picture – a dwarfed and shrivelled uterus with varying degree of deformity and irregularity in its contour, (Madsen 1949, Ko Chi San 1948, Jedberg 1950), uterolymphatic intravasation (Drukmass and Rozin, 1951) and occluded tubes and pelvic lymphnode calcification. (Rubin & Shapira, 1931).

Tubo-ovarian mass may show passage of contrast medium from the dilated tube into a second large cavity.

Deformity associated with uterine scar following Caesarean section can be demonstrated by HSG. This is of value in detecting the related weakness of the uterine scare. Poidevin (1961) reported 2 cases of rupture of uterus where previous HSG have demonstrated large defect at the site of Caesarean scar. Doubtful wound healing is said to be represented by a wedge depression more than 5mm. in depth.

HSG compared with Tubal Insufflation

Tubal insufflation and HSG are both used extensively in the investigation of tubal pathology. What advantages each has over the other both diagnostically and therapeutically has frequently been debated. Tubal insufflation is advantageous in tubal patency investigation – it can be used repeatedly as a diagnostic procedure with possible concomitant therapeutic effect without undue complication: there is no risk of converting partial occlusion to become complete occlusion – a possibility with oily contrast media which can cause granulomatous change in the tubes in HSG.

Hysterosalpingography is more useful in locating the exact site of tubal obstruction as well as diagnosing intrauterine lesion and other gynaecological problems (Rubin, 1947). It is helpful to localise the site of tubal obstruction if tuboplasty is considered.

Error in Diagnosis

The possibility of erroneous diagnosis of tubal patency in both tubal insufflation and HSG is a major problem is cases of infertility. Despite repeated demonstrations of tubal occlusion, pregnancy is not uncommon even without further medical or surgical therapy. Three of our patients who had HSG findings of bilateral tubal occlusion eventually became pregnant. Behrman & Poppy (1957) reported pregnancy in 13 out of 74 infertility cases with dilateral tubal occlusion diagnosed on HSG. Ostry (1951) followed up 149 cases diagnosed as bilateral tubal occlusion by HSG – 27 women had one or more pregnancies, 74 women revealed patent tubes on repeated HSG and insufflation and 3 women have patent tubes diagnosed by retrograde insufflation at laparotomy.

Therapeutic benefits

The therapeutic benefits of both procedures (tubal insufflation and HSG) have been reported but there are some who doubt that these procedures actually increase the chances of conception. The

probably mechanisms involved are either the insertion of the cannula breaking down the mucous plug in the cervical canal or the passage of gas or contrast medium causing the breakdown of weak adhesions which caused the closure of the tubes. These factors enchance sperm migration and ovum transport in the fallopian tubes. In our series of 117, 14 cases (12%) eventually conceived within a period of one year. Eight of these cases in addition to HSG had prior tubal insufflation done. William (1969) in his series of 419 cases of HSG done reported that 179 cases (45%) became pregnant after the procedure. Rubin (1947) reported 7 cases of pregnancies after HSG in his series of 53 in whom only HSG was performed and the tubes found not occluded. In another series of 438 cases whose fallopian tubes showed improvement in patency after 2nd and 3rd insufflation 66 cases (15.07%) became pregnant. These figures compare favourably with the incidence of pregnancy after plastic operation for sterility. Greenhill's analysis of 818 cases of plastic operation showed that only 54 cases (16.6%) became pregnant after operation.

Complications

The side effects of HSG have been widely reported. Our series using water soluble contrast medium, Diaginol viscous, had only 2 cases (1.5%) of complications – one with severe pain in the pelvic peritoneal cavity for 2 days and another bleeding from the cervic traumatised by the insertion of the cannula. This incidence compares favourably with other reported series. Smitham (1959) using the same contrast medium in 85 consecutive unselected HSG had 2 patients with severe pain after HSG and 40% complaining of transient and slight pain when the contrast medium entered the tubes or mild to moderate peritoneal pain lasting for less than one hour. None of his patients however had any pethidine or other premedication. In a large series of 2,500 cases Marshak reported pain in 80% of the cases. The other complications he reported were chemical peritonitis with adhesion, granulomatous inflammatory changes, embolism with lipiodol, intravasation with water soluble dye and exacerbation of chronic infection. Steinberg and Bergnan reported foreign body granulomatous formation after use of oily dye in their cases. Woltz and associates (1958) in their paper on HSG complications obtained the following figures:– pain in 2.8%, shock-like syndrome (Nausea, vomiting) 1.8%, infection 1%, traumatic bleeding 0.6% and intravasatation 1.2%.

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Nasopharyngeal Carcinoma with Hypertrophic Pulmonary Osteoarthropathy

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INTRODUCTION

Hypertrophic osteoarthropathy or "Marie-Bamberger disease" was first described by Eugen von Bamberger in 1889 and then by Pierre Marie in 1890. It is a syndrome consisting of:

(a) non-pitting swelling of the tissues over the ends of long bones (this swelling is usually warm and tender to touch);

(b) clubbing of digits; and

(c) the radiographic appearance of periosteal new-bone formation beginning at the distal ends of long bones (Holling 1961).

Hypertrophic osteoarthropathy is most commonly seen in lung disorders such as carcinoma of the lung, bronchiectasis, chronic lung abscess, empyema and even in fibroma (Price Thomas and Drew 1953) and arteriovenous fistula (Adams, et al 1954). It is less commonly seen in extra pulmonary disorders such as liver cirrhosis (Pugh, 1954) leukaemia (Temple et al 1948) carcinoma of stomach (Singh, et al 1960) carcinoma of esophagus (Cayle et al 1962) myxoedema, polyposis and others. At the present time, bronchogenic carcinoma is considered to be the commonest cause of hypertrophic osteoarthropathy. According to Aufses and Aufses (1960) 0.73% of patients with bronchogenic carcinoma develop osteoarthropathy. However others quote an incidence of as high as 10% (Semple and McCluskie, 1955; Flavell 1956).

The gross pathologic process in osteoarthropathy is essentially one of proliferative subperiosteal osteitis surrounding the shaft of the bone. The long bones (tibia, fibula, radius, ulna, femur and humerus) are the bones primarily involved. However, in advanced cases, the clavicle, rib, scapula and vertebrae may be involved (Ray and Fischer, 1953).

There is proliferation of both the soft tissues and of bones. The periosteum is infiltrated by lymphocytes, plasma cells and leucocytes and as such becomes considerably thickened. Osteoid matrix is formed from the periosteum which develops into a layer of new bone. These changes can usually be demonstrated by X rays.

The new subperiosteal bone formation is from 1 to 5 mm thick in most instances and has a thin cortex surrounding the new cancellous bone. The new bone is soft and very vascular, and can be easily stripped from the old cortex.

Gall, Bennett and Bauer (1951) showed that the distal third of the long bones are involved initally, with progression toward the proximal portions of these bones. Later they found involvement of the shafts of the metacarpals and metatarsals. They also noted that the periosteal changes were greater on the dorsal and medial surfaces.

Various theories have been put forward to account for the association of a lesion in the thorax with a disorder of the limbs in hypertrophic pulmonary osteoarthropathy. These fall mainly into 2 broad categories: neurogenic and humoral. The neurogenic theory suggests that the syndrome is produced by a reflex mechanism with afferent impulses carried from the chest by the vagus producing increased blood flow to the affected regions. This theory has been supported by the observation that vagotomy may lead to prompt

regression of the limb swelling and the pain (Flavell 1956). Various pulmonary vascular shunts – arteriovenous (Hall 1959), venoarterial (Doyle 1959) – have been described in cases with clubbed fingers, and sometimes with osteoarthropathy, but the significance is not well understood.

CASE REPORT

A 45 year old chinese woman was seen in the General Hospital, Kuala Lumpur on 20/8/74 with the chief complaint of breathlessness on exertion for 1 week. She was apparently well till 1 year ago when she developed a vague pricking pain over both her knees which later spread to both her shins and ankles.

Subsequently both her ankles became swollen, red and were tender to touch. Two months later the distal parts of both the forearms became swollen, reddish and tender. Her finger tips then progressively became swollen and her nails beaked. There were no swelling of the toes. At about the same time she developed a low grade intermittent fever associated with occasional chills but no rigors or sweating. She was seen by several general practitioners with no improvement.

One week before admission she developed breathlessness of mild exertion. There was no cough or hemoptysis; no paroxysmal nocturnal dyspnea or chest pain. Her effort tolerance was about 100 yards on a flat ground and one flight of stairs. She neither smokes cigarettes nor drinks alcohol. She lost about 10 lbs. over the past 1 year. There was no history of rash over the face or body; no history of tinnitus, epistaxis or blocked nose.

Five years ago, she had nasal obstruction, epistaxis and tinnitus. Biopsy of her post nasal space showed a poorly differentiated infiltrating squamous cell carcinoma. She was given a course of radiotherapy to the nasopharynx and she had no complaints for 4 years after that.

On examination she was febrile (100°F), thin and anaemic. There were gross clubbing of all the fingers but no clubbing of toes. There was no rash on the face or the body. No jaundice was seen.

The distal third of both forearms were warm, swollen, reddish and very tender with mild limitation of movement of both wrist joints. Similarly the distal third of both legs were swollen, warm and tender with slight limitation of movement of both ankle joints. Both the knee joints were warm and swollen and a mild effusion was present in each joint.

A massive left pleural effusion was detected in the lungs while there was no abnormality detected in the cardiovascular system. There was hepatosplenomegaly: the liver being enlarged to 5 cm below the costal margin, smooth, firm, non tender and nonpulsatile. The spleen was enlarged to 3 cm below the costal margin, smooth, firm, and non-tender. There were no cervical or axillary lymph nodes palpable but the inguinal nodes were bilaterally enlarged, firm and nontender.

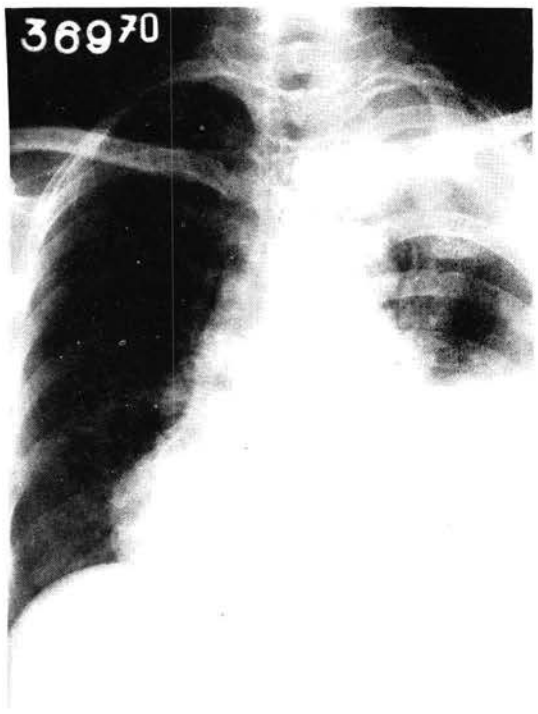
No neurological deficit was detected. There was no tenderness along the vertebral column. Vaginal examination was normal. Postnasal space examination showed an area of necrotic tissue over the roof of the post nasal space – especially on the left side. No growth was seen.

INVESTIGATIONS

The results of the investigations were as follows:

(A) BLOOD:	Haemoglobin	–	6.0 gm/100 ml
	TWBC	–	10300 cells/cu. mm.
	Neutroplils	–	92%
	Lymphocyte	–	6%
	Monocyte	–	2%
	Platelet count	–	150,000 cells/cu. mm.
	ESR	–	125 mm/HR
	Full Blood Picture	–	showed an macrocytic and iron deficiency anaemia

	Bone Marrow puncture	–	Iron deficiency anaemia
	L.E. cells	–	negative (3X)
	Rheumatoid factor	–	negative
	Australian antigen	–	negative
(B)	RADIOLOGY Chest x ray	–	showed a massive left pleural effusion with multiple secondaries in both lungs; especially in the left upper zone as shown in Figures *1a, 1b* and 1c.
	x ray of distal 1/3 of both forearms	–	showed periosteal thickening in both the distal 1/3 of the ulna and radius consistent with hypertrophic osteoarthropathy as shown in figures 2a and 2b.
	x ray of distal 1/3 of both legs	–	showed periosteal thickening of both tibia as shown in Figure 3.
	x ray of both knee joints	–	showed a mild effusion.
	skeletal survey	–	showed no secondaries in the skeletal system.
	liver scan	–	showed an enlarged liver with irregular pick up areas. There was moderate splenomegaly. A querry of liver cirrhosis was made.



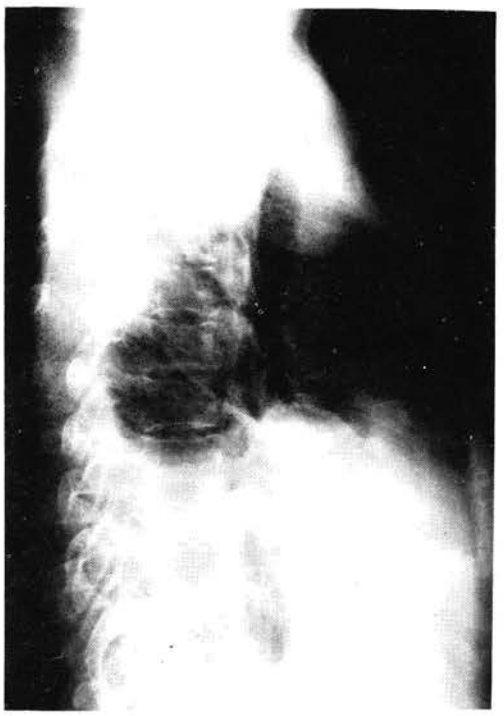


FIGURE 1A *FIGURE 1B*

Chest X-rays (PA View and Lateral View) showing massive left pleural effusion and multiple secondaries in the lungs.

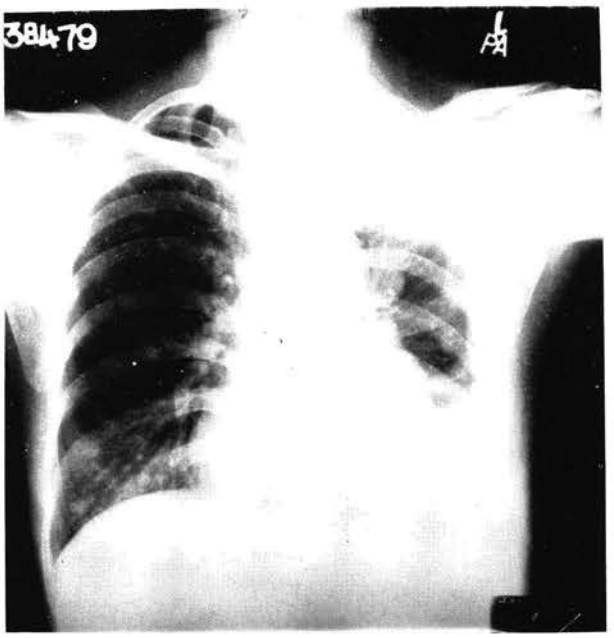


FIGURE 1C

Chest X-ray of same patient after pleural tap.

FIGURE 2A

X-ray of left forearm showing periosteal thickening.

FIGURE 2B

X-ray of right forearm showing periosteal thickening.

(C) PLUERAL TAP

A pleural tap was done and 1200 ml of blood stained pleural fluid was obtained. The pleural fluid contained protein of 2.9/100 ml. No malignant cells were seen but there were many lymphocytes. Culture of the pleural fluid was negative.

(D) BIOPSY OF NASOPHARYNX

No malignant cells seen.

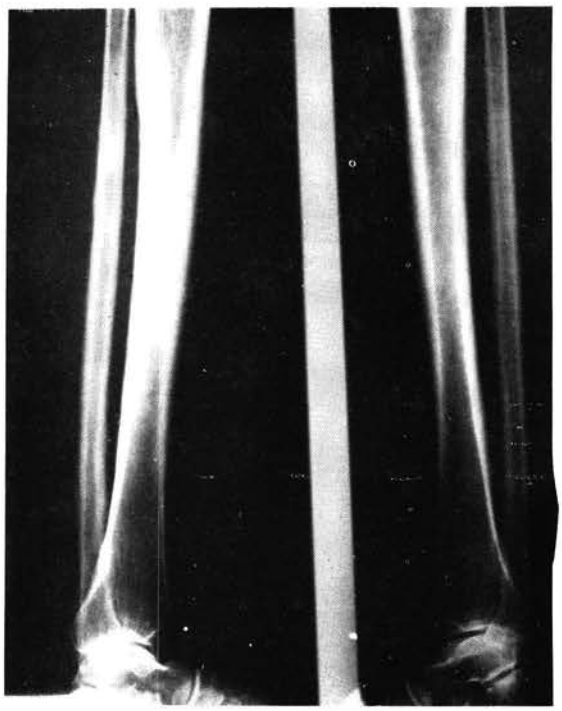


FIGURE 3
X-ray of left and right tibia and fibula showing mild periosteal thickening.

MANAGEMENT

The patient's pain was alleviated with analgesics such as paracetamol and dihydrocodeine while the fever was controlled with paracetamol. Cyclophosphamide (Endoxan) 200 mg was introduced into the pleural space after the pleural tap and subsequently the patient was given 200 mg cyclophosphamide intravenously on alternate days for 5 weeks. This was followed by a course of palliative deep x ray therapy to the left lung over a period of 6 weeks.

PROGRESS

The patient improved symptomatically after the pleural tap, the course of analgesics, cytotoxic drug and deep x ray therapy. She was no longer breathless; the fever settled, the swellings at the distal ends of her extremeties subsided and were nontender. However there was only partial diminution of the secondaries in the lungs.

DISCUSSION

It is of interest to note that the patient developed nasopharyhgeal carcinoma in 1970 and after a course of radiotherapy, she had no complaints for about 4 years until she began to develop symptoms from the hypertrophic pulmonary osteoarthropathy and subsequently symptoms from the secondaries in the lungs. Besides involvement of the distal 1/3 of both the forearms and legs, there were effusion in both her knee joints. The joints are usually less commonly involved and histologically they show thickening of periarticular tissues and erosion of the cartilage may also be present.

Hypertrophic pulmonary osteoarthropathy associated with metastases in the lungs is rarely encountered as in this patient. In a review of world literature by Yacoub et al (1967) he noted only 41 cases. Of the 41 cases reported, only 9 of the cases are attributed to nasopharyngeal carcinoma. Recently, another case of nasopharyngeal carcinoma with hypertrophic pulmonary osteoarthropathy has been reported in Singapore (Toh 1968).

The following table shows the reported cases of nasopharyngeal carcinoma with hypertrophic pulmonary osteoarthropathy.

	Author	Year	Age	Sex	Tumour
1.	Schlagenhaufer	1904	21	F	Carcinoma of nasopharynx
2.	Compere et al	1935	50	M	Carcinoma of nasopharynx
3.	Martin	1939	19	M	Transitional cell carcinoma of nasopharynx
4.	Martin	1939	15	M	Transitional cell carcinoma of nasopharynx
5.	Diner	1962	17	M	Lymphoepithelioma nasopharynx
6.	Papavasiliou	1963	22	M	" "
7.	Papavasiliou	1963	23	M	Epidermoid carcinoma of nasopharynx
8.	Papavasiliou	1963	25	M	Lymphoephithelioma of nasopharynx
9.	Jaffee	1964	27	F	Undifferentrated carcinoma nasopharynx
10.	Toh	1968	40	M	Nasopharyneal carcinoma

ACKNOWLEDGEMENT

We would like to thank Datuk (DR) R.P. Pillay and Dr. J.S. Eapen for their advice and their permission to publish this paper. We would also like to thank Dr. S.T. Kew for his encouragement; Dr. Murkherjee for his excellent interpretation of the X rays and Mr. Charlie Abraham for his fine photography.

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The Place of Bactrim and Vibramycin in Acute Salpingitis

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INTRODUCTION

Bactrim contains trimethoprim and sulphamethoxasole and has a wide range of bactericidal activity against gram positive and gram negative cocci, E. Coli and proteus organisms. It has been used successfully in the treatment of pelvic infections and urinary tract infections. [1 + 2]

Vibramycin (doxycyline) is a relatively new broad spectrum antibiotic synthetically derived from methacycline and is active against both gram positive and gram negative organisms. A comparison was made between the efficacy of Bactrim and Vibramycin in the treatment of acute salpingitis over a 3 year period from 1971 to 1973.

MATERIALS AND METHOD

There was a total of 102 cases. Bactrim was given in 51 and Vibramycin in the other 51.

Patients with acute salpingitis (pyrexia, adnexal tenderness or swelling and offensive or purulent vaginal discharge) were given either Bactrim or Vibramycin. Fifty one cases had Bactrim and the alternate 51, Vibramycin. Patients were started on antibiotics (Bactrim or Vibramycin) prior to the results of the cultures being known. Should the high vaginal swab cultures be sterile, the case was discarded from the trial. Cultures were taken from mid-stream urine specimens and from high vaginal swabs prior to any treatment in all cases.

Blood cultures were performed in those with temperatures of 101°F or more. The doses of the antibiotics used were as follows:—

1. Bactrim — 2 tablets 12 hourly for 5 days each tablet contained 80 mg trimethoprim and 400 mg sulphamethoxasole
2. Vibramycin — 200 mg stat orally and 100 mg 12 hourly for 5 days.

If, at the end of 48 hours, the infection did not show signs of subsiding (e.g. settling pyrexia, diminution of pelvic tenderness or vaginal discharge), the case was recorded as a failure and the antibiotic was discontinued. Other antibiotics were selected for the case according to the culture results.

All unfavourable side effects were noted. All patients successfully treated were discharged home and seen again one month later at the follow-up clinic where pelvic examination was performed and urine and vaginal cultures repeated. All patients with severe infection and whose physical condition was poor or whose lives were in jeopardy e g. bacteraemic shock, were excluded from the trial.

RESULTS

	BACTRIM		VIBRAMYCIN	
DIAGNOSIS	SUCCESS	FAILURE	SUCCESS	FAILU
Acute Salpingitis	43	8	37	14

Successful treatment was indicated by the relief of pelvic pain and tenderness, subsidence of pyrexia, and reduction in the amount of purulent vaginal

discharge. Failure was indicated by no significant improvement or deterioration of the patients condition. Out of 51 cases in each series, there were 8 failures with Bactrim and 14 with Vibramycin.

	BACTRIM		VIBRAMYCIN	
ORGANISM	SUCCESS	FAILURE	SUCCESS	FAILURE
E. Coli	22	2	18	4
Klebsiella-Aerogenes Group	6	0	10	4
Staph. Aureus	4	2	2	2
Streptococcus	6	2	3	0
Proteus	3	0	2	2
Pseudomonas	2	2	2	2
Total	43	8	37	14

The commonest organisms isolated from the vaginal cultures were E. Coli, the Klebsiella-Aerogenes group and the gram positive cocci – staph aureus and streptococcus. Bactrim appeared to be more successful in the treatment of pelvic infection due to these organisms as there were less failures in this group compared with Vibramycin.

SIDE EFFECTS

In the Vibramycin series, 2 patients developed an urticurial rash. In the bactrim series, 3 patients felt nauseated and vomited after taking the tablets and 2 had diarrhoea which stopped when the drug was withdrawn. No other side effects were noticed.

DISCUSSION

Both Bactrim and Vibramycin have been used for the treatment of genitourinary infections with some success – 1 + 2. In our study, however, Vibramycin was not efficacious in the treatment of acute salpingitis as the failure rate was high (27%).

It was found that Bactrim was a better antibiotic to use as it had a higher success rate (85%). There were no significant side effects with both the drugs.

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Episiotomy repair: A comparison of Catgut and Polyglycolic acid sutures

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Since the introduction of catgut, no major advance has been made in the production of absorbable surgical suture materials till the introduction of polyglycolic acid suture in 1970. Polyglycolic acid sutures (PGA) or Dexon (Davis & Geck), is a homopolymer of glycolic acid (hydroxyacetic acid). Its sutures are non-toxic, non-antigenic and flexible. The tensile strength of polyglycolic acid sutures is superior to catgut, silk and polyester sutures of similar diameters. Tests also showed that during critical periods of wound healing, polyglycolic acid sutures retain greater strength and stability than catgut. Another advantage has been the reduction of pain and inflammation after surgery with polyglycolic acid sutures (Rahman and Way 1972, Tompkins & Lea 1972).

To assess some of the properties of polycolic acid sutures among Malaysian women, it was decided to compare this suture with chromic catgut in episiotomy repair. This is because symptoms referable to episiotomy repair are often disturbing in the immediate puerperal period. Any decrease in discomfort would be advantageous in obstetric practice.

MATERIALS AND METHOD

The study consisted of 122 patients who were delivered in the University Hospital, Kuala Lumpur. These patients were selected randomly. These patients had medio-lateral episiotomies.

All episiotomies were repaired in the standard manner: a continuous suture for the vaginal epithelium and interrupted sutures for the muscle layer and skin. The catgut used was chromic catgut (Ethicon) No. 0 and the polyglycolic acid sutures (Dexon - Davis & Geck) No. 0. Needles used were standardised for the episiotomy repair set. Any patients having additional lacerations or extensions of the episiotomies were excluded from the present study.

The aftercare and treatment of the two groups were similar. The cutaneous sutures were allowed to absorb and/or drop out spontaneously during the course of healing. The episiotomies were assessed 18 - 36 hours after delivery and on the third evening prior to discharge. The patients were inquired about puerperal discomforts and their severity. The degree of discomfort were assessed on a scale of 1 to 3, namely 1=mild, 2=moderate, 3=severe. Mild pain was one that is only volunteered on direct questioning; moderate pain was complained of by the patients when they moved while severe pain was discomfort even at rest and which needed analgesics.

RESULTS

During the present study, 61 patients had episiotomies repaired with polyglycolic acid sutures and 61 patients had repair with chromic catgut. Randomisation were satisfactorily achieved in these two groups with respect to:

(a) Age: patients with polyglycolic acid sutures had a mean of 26.66 (S.D. 4.9) years, while patients with chromic catgut had a mean of 26.36 (S.D. 4.8) years.

(b) Race: patients who had polyglycolic acid sutures were made up of 15 Malays, 32 Chinese, 13 Indians, 1 other race while patients who had chromic catgut were made up of 13 Malays, 34 Chinese, 14 Indians.

(c) Parity: there were 36 nulliparous patients who had polyglycolic acid sutures and 39 nulliparous patients who had chromic catgut.

(d) Social class, education and sedation in the antepartum period were similar.

(e) Method of delivery. This was comparable (Table 1)

TABLE I

METHOD OF DELIVERY

	DEXON	CATGUT
Spontaneous	40	36
Forceps (Low)	8	12
Forceps (Mid)	6	4
Ventouse	5	5
Breech (Assisted)	2	4

(f) Doctors repairing the episiotomies were comparable in experience.

Post-partum perineal pain

The incidence of pain-free episiotomy was more common among patients repaired with polyglycolic acid sutures (13 percent) than with patients repaired with chromic catgut (1.6 percent) (Table II). To exclude possible bias, the incidences of abdominal, breasts and anal discomfort were not significantly different for the two types of material.

More patients with polyglycolic sutures had mild discomfort (69 percent) than patients with chromic catgut (38 percent). Among the patients experiencing pain, the degree of suture pain was approximately one quarter less, with a probability of less than 0.05, when comparing these two suture material (1.207 as against 1.666) (Table III.) The degrees of abdominal, breasts and anal discomforts were not significantly different for the two types of material.

TABLE II

RELATIONSHIP BETWEEN INCIDENCE OF EPISIOTOMY PAIN AND SUTURE MATERIAL

SITE OF DISCOMFORT	PATIENTS WITHOUT PAIN		PROBABILITY LEVEL
	POLYGLYCOLIC SUTURE	CHROMIC CATGUT	
ABDOMEN	12	8	$p>0.05$
BREASTS	59	58	$p>0.05$
ANUS	57	56	$p>0.05$
EPISIOTOMY	8	1	$0.05>p>0.02$

TABLE III

DEGREE OF EPISIOTOMY PAIN AND TYPE OF SUTURE MATERIAL

SITE OF DISCOMFORT	DEGREE OF PAIN		PROBABILITY
	POLYGLYCOLIC ACID SUTURES	CHROMIC CATGUT	
ABDOMEN	1.22	1.26	$p>0.05$
BREASTS	1.00	1.00	$p>0.05$
ANUS	1.5	1.2	$p>0.05$
EPISIOTOMY	1.207	1.666	$p>0.02<0.05$

Ease of movements

Ease and freedom of movements were similar to the incidence of perineal pain. Table IV.

TABLE IV

EASE OF MOVEMENTS

EASE OF MOVEMENT	POLYGLYCOLIC ACID SUTURES		CHROMIC CATGUT	
	NUMBER	PERCENT	NUMBER	PERCENT
GOOD	40	82	24	39
RESTRICTED	11	18	34	56
VERY RESTRICTED			3	5
	$X^2 = 23.8$		$p<0.01$	

Integrity of suture line

At discharge, the integrity of suture lines was similar in both groups, being intact in all cases.

Healing

About 60 percent of patients were seen in the routine post-natal clinic 6 weeks after delivery. By then, all the episiotomies had healed well.

DISCUSSION

It would seemed that polyglycolic acid sutures had considerable advantage over chromic catgut sutures in episiotomy repair. This is especially seen in the low incidence of episiotomy discomfort and pain. The degree of pain, when present was less. This was also reflected in the greater ease and freedom of movement after episiotomies with polyglycolic acid sutures when compared with

chromic catgut ($p<0.01$).

These findings seemed no different from previous studies. Livingstone et al (1974) showed that almost half of his patients who had episiotomy repair with plain catgut, as compared with 22 percent of patients who were repaired with polyglycolic acid sutures, had "painful" to "unbearably painful" sutures. They also noticed a lower incidence of oedema of the episiotomy wound when repaired with polyglycolic acid sutures. Rogers R.E. (1974) in a study of 600 randomly selected American women showed that the incidence of pain and its severity were significantly less when polyglycolic acid sutures were compared with chromic catgut in episiotomy repair. These results seemed consistent with light and electron microscopy findings that polyglycolic acid sutures evoke much less inflammatory response than did catgut and other suture materials (Echeverria and Jimenez 1970).

The price of polyglycolic acid sutures is marginally more then catgut.

One disadvantage seemed to be that polyglycolic acid sutures were more difficult to handle initially and there was a tendency for the initial knot to be more "loose".

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The Grossly enlarged or "Missing" sella

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INTRODUCTION

Enlargement of the sella turcica as a mirror of diseases has been exhaustively discussed by many authors (Camp 1949; Thomson 1955; Mahmoud 1958; New 1966) but little has been written about the grossly large sella turcica.

As far back as 1910, Schuller has pointed out that on a plain film of the skull, radiological distinction between surprasellar and intrasellar tumours could not be definite. This has been widely accepted for many years but since then, attempts have been made by several authors (Camp 1950; Epstein 1951; Ross & Greita 1966; Du Boulay & Trickey 1970; Stargardter & Margolis 1972) to establish a definite relationship between sellar changes and the site of the primary lesion.

Our aim is to identify the site and possible nature of causative lesion on plain films in the grossly enlarged sella turcica, (as seen in the University Hospital, University of Malaya) and to suggest the ideal neuroradiological investigations.

MATERIAL

(a) Chromophobe Adenoma

A female, 26 years old had mental and physical retardation since birth. She can say a few words sensibly and obey simple commands. Recently she had urinary incontinence. There were features of cretinism with scaly, coarse skin, coarse voice and infantile lim proportions.

2 Hr. I^{131} uptake 3%
24 Hr. I^{131} uptake 3%

Visual fields showed bitemporal hemianopia with pallor on both discs. VAL 6/60 VAR 6/60.

Skull:- Demonstrate a typical "ballon" sella. The sella was grossly enlarged. The dorsum sella was very thin and bowed. Under-cutting of the anterior clinoids which are large and prominent was seen.

AEG:- Showed a large intrasellar lesion with a large suprasellar extension obliterating anterior 2/3 of III ventricle, and undercutting the anterior horns of the dilated lateral ventricles.

At operation - Chromophobe adenoma.
Pituitary tumour pushing optic chiasm back.
Both optic nerves were stretched and thinned out.

(b) Cystic Craniopharyngioma

A male, 28 years, had a history of left-sided headaches for 13 years, which became more severe after a motor vehicle accident in which he lost consciousness for 10 hours, 3 years ago.

Had history of failing vision, decreased libido, decreased concentration, and intellectual deterioration.

There was bitemporal hemianopia. VAR 6/9, VAL 6/12. The plain films show that there was destruction of the floor of the sella with undercutting of the anterior clinoid processes which were prominent. The dorsum sella was thinned and not bowed. There were some irregular calcification just above the sella. Note position of yttrium implant.

Air ventriculogram:- showed a massive suprasellar mass with total obliteration of the III ventricle with upward extension to the anterior

horns of the dilated lateral ventricle.

(c) Aqueduct Stenosis

A 28 year-old male who had been mentally slow since childhood. He has been unable to retain employment as he was too "slow". Had ? hemiplegia 8 years ago and was admitted to a Hospital. There was improvement of this ? hemiplegia but noticed increasing weakness of left limbs for past 4 years.

Fundi – the optic discs showed no clear cut margin with peripheral pigmentation. VAR 2/60 VAL 2/60.

The plain skull films showed that the sella turcica was grossly enlarged, the enlargement more marked. posteriorly. The dorsum sella was foreshortenend and indistinct. Anterior clinoid processes were thickened and large with steep anterior walls.

AEG:- Air could not enter the ventricular system but instead into the subarachnoid cisterns and cortical sulci.

Air ventriculography:- showed a grossly dilated front end of the III ventricle occupying the whole of the sella turcica. No air seen in the cerebral sulci and confirms the disgnosis of aqueduct stenosis.

(d) Meningioma

A male, 40 years had headache, giddiness, and transient obscuration of vision for 4 years. Last 1½ years of loss of libido, and cold intolerance. Recently there had been personality changes, nocturnal anuresis and tinnitus. Noticed failing vision for past 6 months. Right amaurosis with left upper temporal quadrant defect. There was bilateral papilloedema with secondary optic atrophy.

The plain films show that the sella turcica was enlarged with almost absence of the dorsum sella and irregular floor. There was also absence of the lamina dora posteriorly with undercutting of the anterior clinoid processes and sclerosis of orbital plate

Left carotid angiogram:- highly vascular extensive but fairly circumscribed space occupying lesion measuring 9 cm in the widest diameter in left cerebral hemisphere occupying the frontal lobe and extending backwards and downwards invading the parietal and temporal region. Note the large anterior meningeal artery supplying this lesion. The anterior cerebral artery was pushed backwards.

At operation:- large vascular meningioma arising largely from the pterion and outer third of the sphenoid wing and extended posteriorly to attach to the frontal horn of the lateral ventricle. Inferiorly, it extended towards the optic nerves were intact.

(e) Nasopharyngeal Carcinoma

A 45-year-old female complained of left-sided nasal obstruction and blood-stained nasal discharge for eight months and headaches for past five months.

Last 10 days she had paraesthesis and ptosis of both eyes. Both eyes exhibited no movement at all. Right pupil was fixed and ¾ dilated. Left pupil reacted sluggishly to light and ½ dilated.

On biopsy a large fungating growth at the left post-nasal space pushing the soft palate forward and the uvula to the right was seen. Enlarged matted lymph nodes at upper cervical region were palpated.

Biopsy results showed squamous cell carcinoma of the nasopharynx.

The plain skull films show that there was haziness of the sphenoid sinus with destruction of the posterior aspect of the floor of the sella and the dorsum sella. Undercutting of the anterior clinoid processes was seen.

The view of the neck showed a large irregular soft tissue mass in the nasopharynx.

(f) Primary Empty Sella Syndrome with Communicating Hydrocephalus

A male 60 years had periodic left-sided temporal headaches for 10 years, which became more severe during the past 6 years. Loss of libido and erection for 4 years. Visual fields showed a definite loss of both upper quadrants of temporal fields. VAR 20/30 VAL 20/40. No papilloedema or optic atrophy.

The plain films showed that there was extensive destruction of the body of the sphenoid. The dorsum sella was totally destroyed with undercutting of the anterior clinoid processes which were large and prominent.

AEG:- Large air-containing cyst within the sella which communicate with the basal cistern. Note dilatation of the III and lateral ventricles. Consistent with intrasellar subarachnoid cyst with the communicating hydrocephalus.

Discussion

This paper is not aimed to give a comprehensive account of all the known cases of grossly enlarged

sella as other well known lesions e.g. suprasellar artrocytoma, chordoma, plasmacytoma and aneurysms have been left out as they have not been seen in the University Hospital.

The cases discussed can be grouped into

(a) Intrasellar lesions - chromphobe adenoma.

(b) Suprasellar lesions - craniopharyngioma.

(c) Lesions remote from the sella
  (1) Aqueduct stenosis
  (2) Frontal meningtoma
  (3) Nasopharyngeal carcinoma
  (4) Empty sella

(a) Coromophobe Adenoma (Fig. IA & IB)

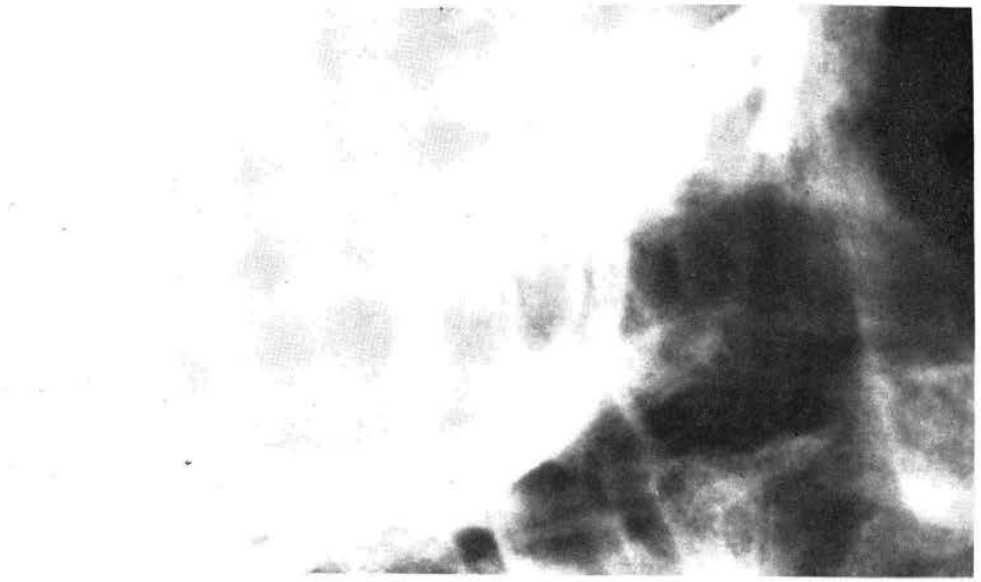

Fig. 1A Plain skull film of chromophobe adenoma showing grossly enlarged sella turcica and undercutting of anterior clinoids.

Fig. 1B AEG showing a large intrasellar lesion with large suprasellar extension obliterating anterior 2/3 of III ventricle.

The findings of a "Ballooned" sella on plain radiograph and clinical finding of a visual field defect must almost certainly indicate the presence of a pituitary adenoma. Only 7% of carniopharyngiomas and 4% of optic gliomas show a "ballooned" sella (Ross, 1966). The suprasellar extension of a pituitary adenoma is of utmost importance to the neuro-surgeon and air study is the investigation of choice to demonstrate tumour size and extent. The choice between ventriculography or lumbar air encephalogram is dependent on the presence or absence of papilloedema.

(b) Craniopharyngioma (Fig. 2A & 2B)

Fig. 2A Plain skull film of craniopharyngioma showing destruction of floor of sella with irregular calcification just above the sella.

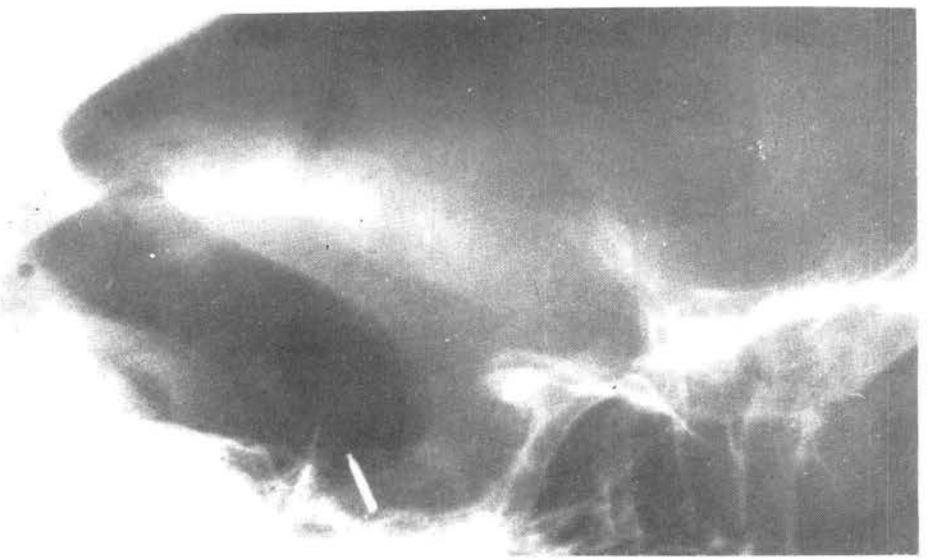

Fig. 2B Air ventriculogram showing a massive suprasellar mass with total obliteration of the III ventricle.

The presence of a grossly enlarged sella with suprasellar calcification is highly suggestive of craniopharyngioma. This is present in our patient. Craniopharyngioma exhibits calcification in the majority of cases in children and in less than half of the cases in adults. The dorsum sella is known to be short and flat topped in 50% of cases (Du Boulay, 1967). However in our case the dorsum is not short or flat topped but is seen to be angulated forward at less than 90% and there is irregular amorphous calcification. The extent of calcification do not necessarily indicate the full extent of the tumour and lumbar air encephalography or ventriculography is necessary to delineate the full extent of the tumour.

Other tumours exhibiting calcification are

(1) Chordomas.
(2) Chromophobe adenomas (1.2 - 6%) (Camp 1950; Du Boulay & Trickey 1962)
(3) Meningiomas (5 - 15%)
(4) Aneurysm

Angiography may be necessary to ascertain the pathology of the tumour mass as craniopharyngiomas and chordomas are virtually always avascular.

(c) Aqueduct Stenosis (Fig. 3A & 3B)

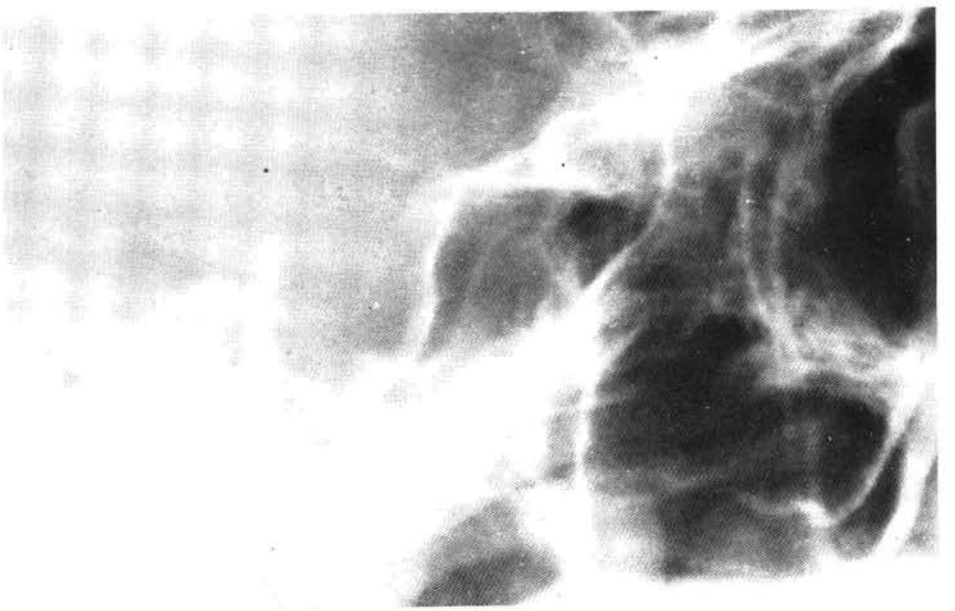

Fig. 3A Plain skull film of aqueduct stenosis showing sella turcica grossly enlarged with thickened and large anterior clinoid processes.

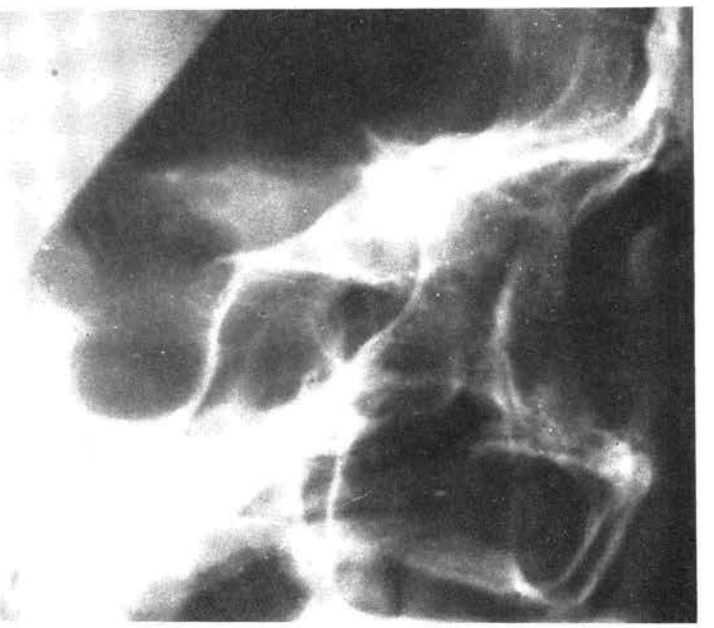

Fig. 3B Air ventriculogram showing grossly dilated anterior end of III ventricle occupying the whole of the sella turcica. No air seen in cerebral sulci or cisterns.

The classical plain film findings of aqueduct stenosis in an adult are:

(1) Short dorsum (44%).
(2) Long steep anterior wall consisting partly of a more or less vertically placed elongated sulci.
(3) Massive anterior clinoid processes (Du Boulay & Trickey 1970).

Our case shows all of the above findings.

The investigation of choice would be air Myodil ventriculography as this would demonstrate the presence of total or incomplete aqueduct obstruct.

(d) Meningioma (Fig. 4A & 4B)

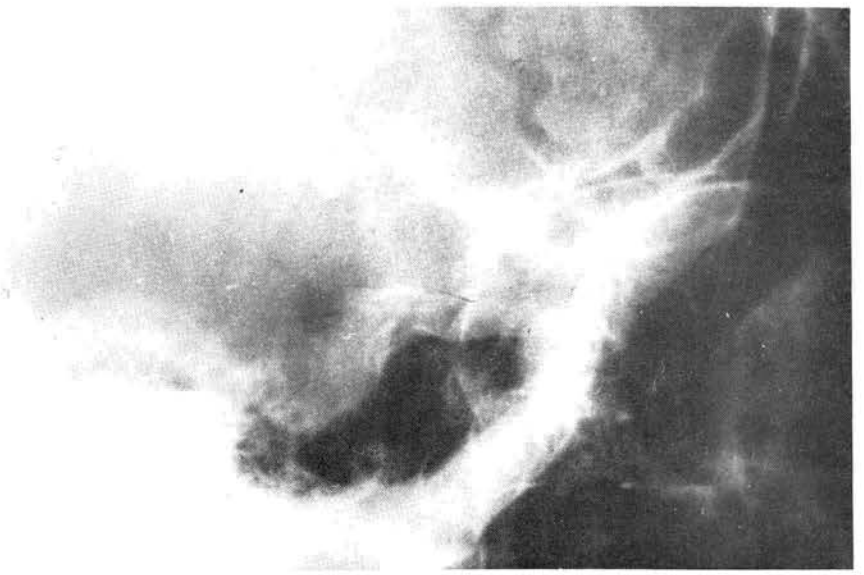

Fig. 4A Plain skull film of meningioma showing enlargement of sella turcica with absence of the lamina dura posteriorly and sclerosis of orbital plate.

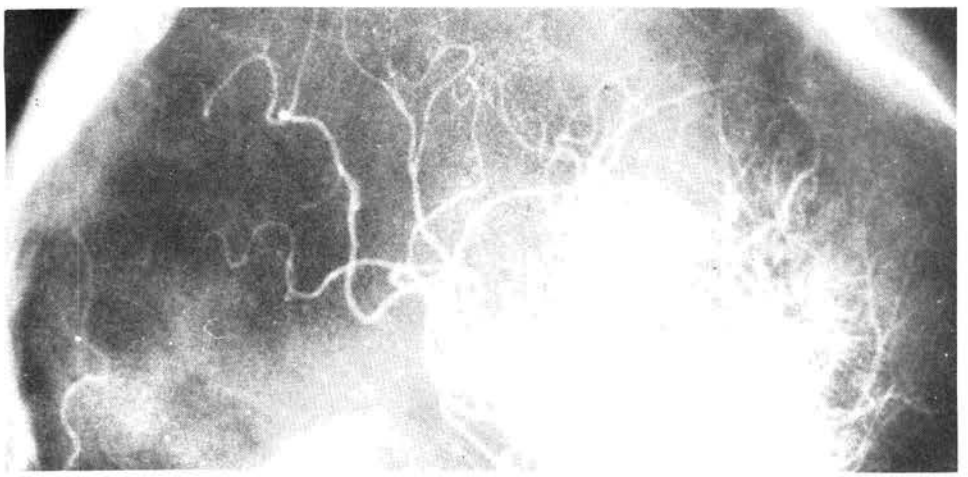

Fig. 4B Left carotid angiogram showing highly vascular circumscribed lesion supplied by large anterior meningeal artery.

Meningiomas distant from the sella, e.g. parietal or frontal regions can produce changes in the sella, similar to those produced by raised intracranial pressure. These are

(1) truncation or absence of the dorsum sella.
(2) loss of lamina dura or the dorsum sella.
(3) undercutting of the anterior clinoid processes.
(4) Large sella.

The findings are not specific but if sclerosis can be visualised as in our patient who has sclerosis of the orbital plate than the diagnosis of meningioma would almost be a certainty. Furthermore 15% of meningiomas calcify (Sutton 1971).

The next investigation of choice would be a brain scan. The will show an area of increased uptake. Angiography is invariably necessary to show the extent to the tumour and arterial supply.

(c) Nasopharyngeal Carcinoma (Fig. 5A & 5B)

Fig. 5A Plain skull film of nasopharyngeal carcinoma showing haziness of sphenoid sinus with destruction of dorsum sella and posterior part of floor of sella.

Fig. 5B Large irregular soft tissue mass in the nasopharynx.

Nasopharyngeal carcinoma is known to destroy the sella by direct extension. As in our case there is direct extension through the sphenoidal sinus to involve the dorsum sella with destruction of the posterior half of the sella turcica. The diagnosis can be implied from the large soft tissue mass in the nasopharyngeal space and a history of epistaxis.

(f) Empty Sella Syndrome (Fig. 6A & 6B)

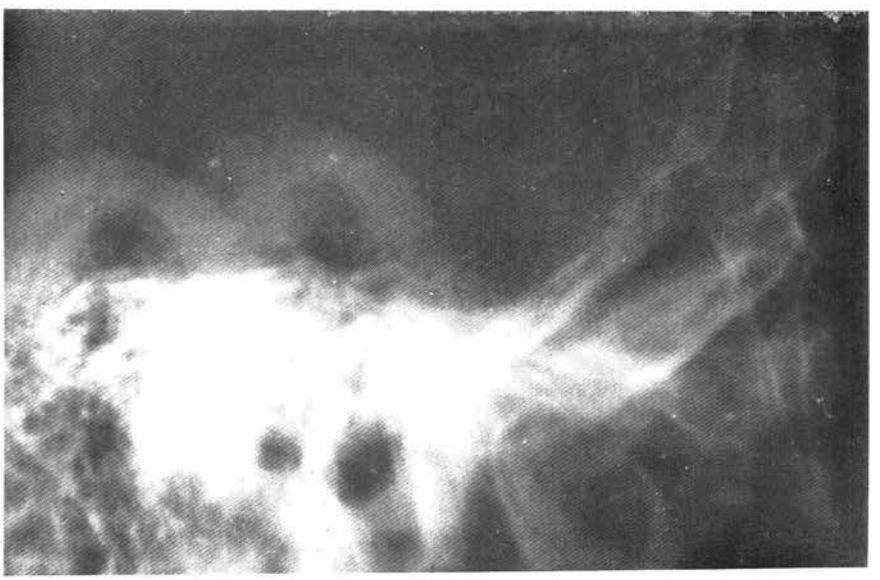

Fig. 6A. Plain skull film of primary empty sella showing extensive destruction of body of sphenoid with destruction of dorsum sella and undercutting of the anterior clinoids.

Fig. 6B. AEG showing large air containing cyst within the sella which communicates with the suprasellar cistern.

In this condition, the sella is large in 84% of patients. The cause is attributed to elevation of intracranial pressure which could be slight or intermittent, remodelling the anatomy of the sella through a congenital incompleteness of the sella diaphragm. This syndrome is seen mainly in females (Neelon et al. 1973). Our patient is a male and showed total absence of the dorsum sella with undercutting of the anterior clinoid process.

The presence of a grossly enlarged sella or "missing" sella without any radiological visualisation of calcification, raised intracranial pressure, sclerosis or extension from a nearby tumour could suggest an empty sella syndrome.

If there is no evidence of papilloedema the investigation of choice would be fractional lumbar air encephalogram.

SUMMARY

Six cases of grossly enlarged sella are discussed. The cases include chromophobe adenoma, craniopharyngioma, aqueduct stenosis, meningioma, nasopharyngeal carcinoma and the empty sella syndrome.

The plain film findings and the appropriate specialised neuroradiological investigations are discussed.

An attempt has been made to correlate the changes in and around the sella turcica on plain films to serve as a pointer towards the nature of the pathological processes. This will influence the selection of the ideal investigation or investigations necessary to demonstrate the extent and the pathology of the tumour.

ACKNOWLEDGEMENTS

We wish to record our thanks to the Medical Illustration Department, University of Malaya for the photographs and to Miss Janet Low for typing the manuscript.

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Med. J. Malaysia Vol XXX No. 2. Dec. 1975

The Incidence of Pineal calcification in the adult Singapore Population

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Synopsis:

The incidence of pineal calcification is appreciably lower in the adult community of Singapore when compared with similar groups in the Western population. It is found to range from approximately 20 per cent in the 20–29 age-group to 40 per cent in the 60 and over age-group with a weighted mean incidence of 30 per cent. The low frequency of pineal calcification is well known among local radiologists but it seems to have escaped formal investigation. The low incidence poses a handicap as radiologists are more often deprived of a simple and valuable means of detecting brain shift.

Introduction:

The pineal body which philosophers like Descartes thought to be the seat of the soul, is a cone-shaped organ, about 7 by 5 mm in size. It is located within the brain being attached to the diencephalon by the pineal stalk. It has now been established that the pineal is really not part of the brain and receives its sole neuronal input from the peripheral autonomic system.

While in lower vertebrates, the pineal serves as a neurosensory photoreceptive organ with a function akin to that of the retina of the eye, it is a secretory gland in mammals. It contains a group of active substances related to indole, the so-called "indole hormones", which include melatonin and serotonin.

Recent researches have shown that the receptors sensitive to the pineal hormones are localised almost exclusively in the brain. Published evidence for a nervous site of action of these hormones include: (a) studies indicating that exogenous melatonin is concentrated by nervous structures (Anton-Tay and Wurtman, 1969); (b) the observation that melatonin may modify some biochemical processes in the brain, such as the metabolism of serotonin (Anton-Tay et al, 1968); and (c) the data that brain implants of melatonin, but not intrapituitary ones, may reduce gonadotrophin secretion (Fraschini, Mess and Martini, 1968). The importance of the pineal gland in human physiology has yet to be assessed.

Of radiological importance is the fact that after puberty granules of calcium and magnesium salts appear in the gland (Barr, 1972). These calcareous granules coalesce later to form large particles so that the organ may become visible on plain x-ray films. The frequency of visualisation of the pineal increases with advancing age.

Dyke (1930) in a study of 3,000 consecutive skull radiographs found the pineal body visible in about 60 per cent of American adults. Vastine and Kinney (1927) noted pineal calcification in approximately 55 per cent of American subjects above the age of 20. More recently, British authors, du Boulay and O'Connell (1969) estimated that calcification occurs in some part of the pineal organ in 50 to 70 per cent of all adults.

The calcified pineal body serves as an excellent midline indicator. It is centrally situated, lying under the falx cerebri and is readily susceptible to shift by a space-occupying intracranial lesion. The importance of a lateral pineal shift was first pointed out in 1918 by Schuller, regarded as the

father of neuroradiology. The assessment is, of course, made on anteroposterior or frontal skull films.

Detection of pineal displacement in the vertical or anteroposterior direction, as assessed on the lateral skull film is of less importance but may give an indication of the presence of tentorial pressure cone. The Americal school attaches greater value to this sign than others and numerous methods have been devised. Of these, the best known is the Vastine-Kinney method (1929). One such method has been described by the writer (Oon, 1964).

It has been the impression that the incidence of pineal calcification is appreciably lower in the people of South East Asian countries compared with those living in the Western hemisphere. However, to the best of the writer's knowledge, the incidence of pineal calcification in this region has not been reported. Arumugasamy (1966) mentioned that "in one series, 45 per cent of the adult skull had calcified pineals" but did not state where the study was made.

Most studies on the incidence of pineal calcification were made by visualising the gland on the lateral skull film. The identification of the calcified gland on the anteroposterior view is more important but the gland may be obscured, depending on radiographic projection, by the crista galli, the wall of the frontal sinuses, the calcified falx cerebri and the occipital protuberances. For the purpose of comparison, this project was based on a study of lateral skull radiographs of our local subjects.

A difficulty encountered early in the investigation is the fact that the habenular commissure which is situated immediately anterior to the pineal gland may be calcified. The phenomenon of habenular calcification is familial to anatomists for some time but it is not known to radiologists until the reports of Smith (1953) and Stauffer, Snow and Adams (1953).

The habenular calcification varies from a barely discernible fleck to a C-shape mass of calcium with the open end of the C facing backwards. This calcification may occur independently of pineal calcification and it is possible there was some confusion between the two types of calcification among earlier investigators. For the purpose of this study, habenular calcification has not been considered.

Material, method and results:

Patients referred from the Emergency Unit, usually as cases of head injury, were chosen for this study. The series consisted of skull x-rays of 1,250 cases, comprising 250 cases each in age-groups of 20-29, 30-39 40-49, 50-59 and 60 years and over. The cases in the respective age-groups were unselected though where the skull films were radiographically unsatisfactory, the cases were not included for study. The value and significance of the use of this method will be discussed later.

The breakdown of the whole series into ethnic groups is given in Table I. When compared with the racial distribution of the population as a whole (Arumainathan, 1970), the Indians were relatively more numerous in this study-group. This is probably due not to the fact that the Indians were more accident-prone; but to the observation that Indians, more than the Chinese and Malays, readily sought conventional medical care (Shanmugaratnam, 1973).

The results are presented in Table II. Table III gives the age-structure of the Singapore population in 1970 (Arumainathan, 1970).

Discussion:

The use of this somewhat unorthodox method in computing the incidence of pineal calcification has some decided advantage. The estimation was based on age groups of a specified number and it is essential that the subjects of each age-group were unselected and made up to a significant size.

The incidence of pineal calcification in the local adult population can be assessed, once the frequency of calcification in each age-group is worked out and the age-structure of the population is known from recent census or other sources. It is recognised that there is a definite trend towards longevity with improved health care. Given this consideration, it would appear this method is superior to the usual method which entails a haphazard collection of subjects.

The incidence of pineal calcification varied from 23 per cent in the 20-29 age-group to 41 per cent in the 60 and over age-group. The weighted mean incidence is estimated at 30.4 per cent based on the population statistics of 1970. This is appreciably less than figures encountered in the Western population groups.

Table I

Ethnic Group Distribution

Age–group	Chinese	Malays	Indians	Others
20–29	204	24	16	6
30–39	184	26	34	6
40–49	158	23	67	2
50–59	170	21	55	4
60 and above	213	15	18	4
Total	929	109	190	22
Percentage	74.3	8.7	15.2	1.8
Percentage of racial distribution in population (1970)	76.2	15.0	7.0	1.8

Table II

Incidence of pineal calcification

Age–group	Positive	Negative
20–29	57 (22.8%)	193
30–39	74 (29.6%)	176
40–49	80 (32.0%)	170
50–59	99 (39.6%)	151
60 and above	102 (40.8%)	148

Table III

Age–structure of adult population in Singapore (1970)

Age-Group	Number	Percentage of adult population
20–29	336,480	32.9
30–39	249,276	24.4
40–49	182,623	17.8
50–59	136,588	13.3
60 and above	118,287	11.6
Total	1,023,254	100

It is assumed that all studies of pineal calcification incidence were made with skull films of optimal quality as small pineal calcification may be overlooked or may not be visible if the films are incorrectly exposed or are unsharp. The incidence should also be viewed in the light that in the earlier series, the habenular calcification might have been mistaken for the pineal calcification where the latter

was not visible. However, recent estimation as by du Boulay and O'Connell confirmed that in Western countries, the incidence of pineal calcification in adults ranges from 50 to 70 per cent.

Another source of confusion is the calcification of the choroid plexuses of the lateral ventricle. The calcification is more posteriorly situated and is usually composed of small discrete calcifications making up one or usually two groups of larger but fainter opacities. The differentiation from the pineal calcification can usually be made with ease from the anteroposterior view.

The skull configuration may also be a factor in the computation. The skulls of Caucasians are usually dolichocephalic, i.e. longer than broad. The Indians, especially the Northern Indians of Aryan stock have this skull configuration more than the Southern Indians who are derived from the Dravidian stock (Crooke, 1969). The Chinese and the Malays, on the other hand, have a mesocephalic or brachycephalic skull. The visualisation of a small calcified structure like the pineal is dependent to some extent on the thickness of brain tissue penetrated by x-rays. Thus, in the dolichocephalic skull, the slightly smaller width of the cranium may permit a better visualisation of the calcified pineal than in other types. However, it is believed the advantage is most probably not significant.

The incidence of pineal calcification, as visualised on the anteroposterior or frontal view has not, to the writer's knowledge, been worked out. By the rule of the thumb, it is usually seen in half of the subjects in whom the pineal calcification is visible on the lateral view. The low incidence of pineal calcification in the local population presents a definite handicap as the radiologist is more frequently deprived of a simple and valuable means of detecting brain shift.

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3 Case reports of Meckel's Diverticulum

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This rare condition is often quoted as occuring in 2% of the human race, 2 feet from the ileocaecal valve and being 2 inches long. It usually presents as its complications since 20% contains heterotopic epithelium:–

1) Severe haemorrhage due to peptic ulceration.
2) Intussusception.
3) Inflammation.
4) Chronic Peptic Ulceration.
5) Intestinal Obstruction.

The latter occur less frequently but I shall describe 3 cases which occured in Taiping Hospital within 3 months and their plain x-ray findings.

PATIENT L.K.K. (AGE 5)

History (30.10.74)
One day colicky abdominal pain with associated vomiting, sweating and fever. Bowels not opened one day.

Examination. Temp. 99.8°F.
Abdomen distended especially around the umbilicus. Not tender. No visible peristalsis. No mass felt. Bowel sound presents. PR – Normal stools. Intestinal Obstruction. Laparatomy done on 22.10.74.

Findings (1) Long Meckel's diverticulum ending with a cord at the umbilicus.
(2) Associated rotation of gut and intestinal obstruction.

Operation – diverticulectomy and release of band.

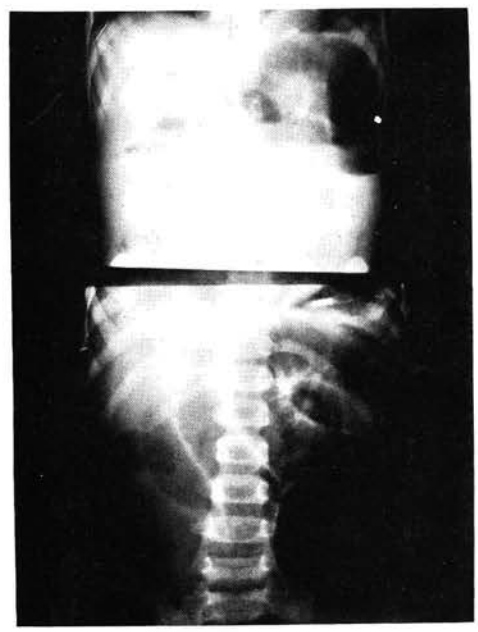

Fig: 1
Small Intestinal Obstruction Due to Band connected to Meckel's Diverticulum.

PATIENT A BIN H (AGE 8)

History (6.12.74)
Pain 2 days over the abdomen especially umbilicus. Vomiting. Constipation.

Examination. Abdomen – distended with eversion of umbilicus and RIF, sluggish bowel sounds.

Subacute intestinal Obstruction. Laparatomy done on 8.12.74.

Findings. Meckel's diverticulum connecting ileum to umbilicus and causing partial intestinal obstruction.

Operation done: Diverticulectomy and release of obstruction.

Fig: 2
Air in Meckel's Diverticulum just to the right of Centre of Abdomen.
Partial Volvulus of Distal Colon.

PATIENT A BIN O (AGE 8)

History (8.1.75)
Vomiting many times 2 days. Constipated 3 days. Passed round worms in the stools.

Examination. Abdomen distended. Bowel sounds sluggish. No Palpable mass.

PR – Hard faeces (Trichuris ova seen) Intestinal Obstruction (By Worm Infestation?)

Laparatomy done on 9.1.75

Findings. (1) Pus in peritoneal cavity.
(2) Sloughing Meckel's diverticulum which had formed a band over caecum.
(3) Appendix also inflammed secondary to the sloughing Meckel's Diverticulum.

Operation done: diverticulectomy and appendicectomy.

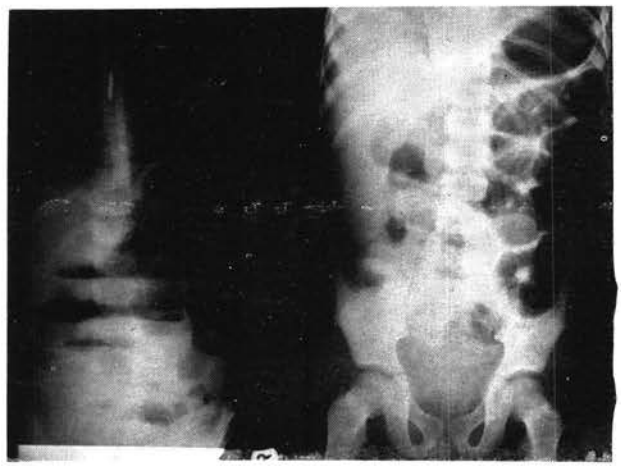

Fig: 3
Distended loops of small and large bowel with multiple fluid levels due to peritonitis.

Summary of Radiological Manifestations of Meckel's Diverticulum.

Plain film.
1) Gas in Diverticulum.
2) Enterolith.
3) Abscess formation or fluid in abdomen from perforation.
4) Small bowel obstruction.

Barium Follow Through.
1) Diverticulum.
2) Intussusception (coiled spring appearance)
3) Persistent separation of bowel loops about an inflamed diverticulum.
4) Filling defect in barium filled ileum.

Angiography.
Bleeding site revealed.

99 m Technetium.
Isotope taken up by ectopic gastric mucosa.

Acknowledgement

I wish to thank the Director General of Medical and Health Services of Malaysia, Tan Sri Datuk (Dr.) Abdul Majid Ismail for permission to publish these case reports, the Surgical Unit for supplying the Clinical Data and my Radiographers who took the excellent radiographs and especially Mr. Mohd. Amin bin Deta for typing this paper and Mr. Francis Leong Foo Sen for taking the photographs.

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Ramsay-Hunt Syndrome with complete recovery of cranial nerves

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Introduction

The syndrome characterised by facial paralysis associated with hearing loss, dizziness and an eruption of blisters on the auricle due to Herpes Zoster was described by Ramsay Hunt in 1906. This syndrome is now synonymous with Herpes Zoster oticus. Hunt thought that the symptoms resulted from geniculate ganglionitis caused by the Herpes virus. Subsequently Denny Brown (1944) has shown that there is little if any ganglion involvement, though there is definite lymphocytic infiltration of the nerve. However the inflammatory changes per se are not sufficient to cause paralysis. Crabtree (1968) attributes the frequent involvement of the facial nerve to the fact that it travels through a bony canal for almost 30 mm. in the skull. The inflammatory changes cause sufficient swelling, oedema and accumulation of metabolites within the fixed bony canal which results in ischaemic paralysis. The incidence of Ramsay Hunt syndrome varies with different authors from 2% – 9% of all facial palsies (Francisco Antoli-Candela, Jr. et al 1974). There are many similarities between Ramsay Hunt syndrome and Bells palsy in the clinical behaviour, the predictability from electrical tests and the time of recovery, Atkins and Brain (1933), Taverner (1955), Gregg (1961) and Tonita et al (1971). However the paralysis in Herpes Zoster is more likely to be a complete paralysis.

Case Report

L.T.L., 47 year old Chinese male was admitted as a casualty to the E.N.T. Unit, University Hospital on the 28th May 1974, with severe right otalgia 6 days. He also had fever 4 days, inability to talk clearly and weakness of the right face 4 days and a rash and pruritus in the right ear on admission. He experienced hyperacusis on the right side and complained of loss of taste on the right side of tongue.

He gave a past history of diabetes, but never had chicken pox.

On examination, he was a well built middle aged male. The significant findings were a swelling of the right side of face with loss of right nasolabial fold. He had a vesicular rash on the right concha with scabbing (Fig. 1). There were also vesicles on the external auditory meatus. There was a complete seventh nerve paralysis on the right side (Fig. 2) and loss of taste in the right anterior 2/3 of tongue. There was also decreased lacrimation on the right as tested by Schirmers Test. There was evidence of hearing loss on the right ear (Fig. 3) and complete vestibular paralysis on the right as evidenced in the electronystagmography (Fig. 4). Viral culture for herpes was negative. Electromyography confirmed early changes of muscle degeneration.

The patient was treated with 200 mg. Cortisone daily for 2 days, followed by 100 mg. daily for 2 days, 50 mg. daily for 2 days, 25 mg. daily for 2 days and finally 10 mg. daily for 2 more days. The face was stimulated with galvanic current, daily massaged and exercised. The diabetes was controlled initially with ½ tablet of Tolbutamide while on steroid therapy, and later controlled on a low caloric diet alone.

Fig. 1 *Right ear on admission showing the rash on the auricle.*

Fig. 2 *Face of the patient on admission.*

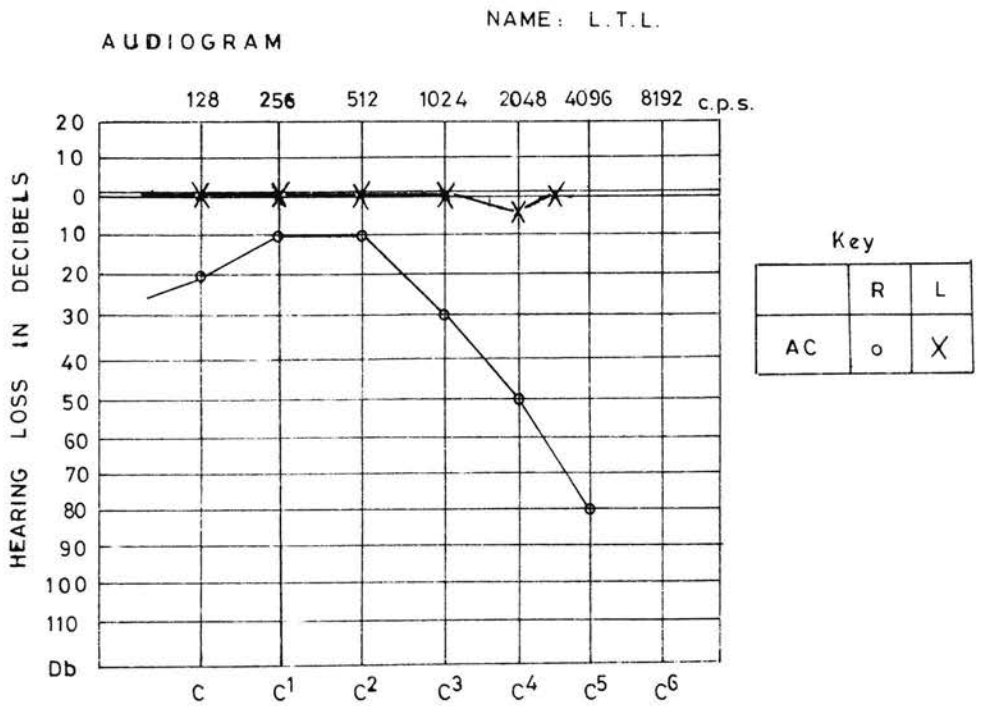

Fig. 3 *Audiogram done on 30.5.1974.*

The patient was followed up and after eight weeks there was a complete recovery of the face (Fig. 5), hearing (Fig. 6) and vestibular function (Fig. 7).

Fig. 4 Electronystagmograph on 30.5.1974. Right canal paralysis on caloric stimulation.

Fig. 5 Face of patient after 8 weeks.

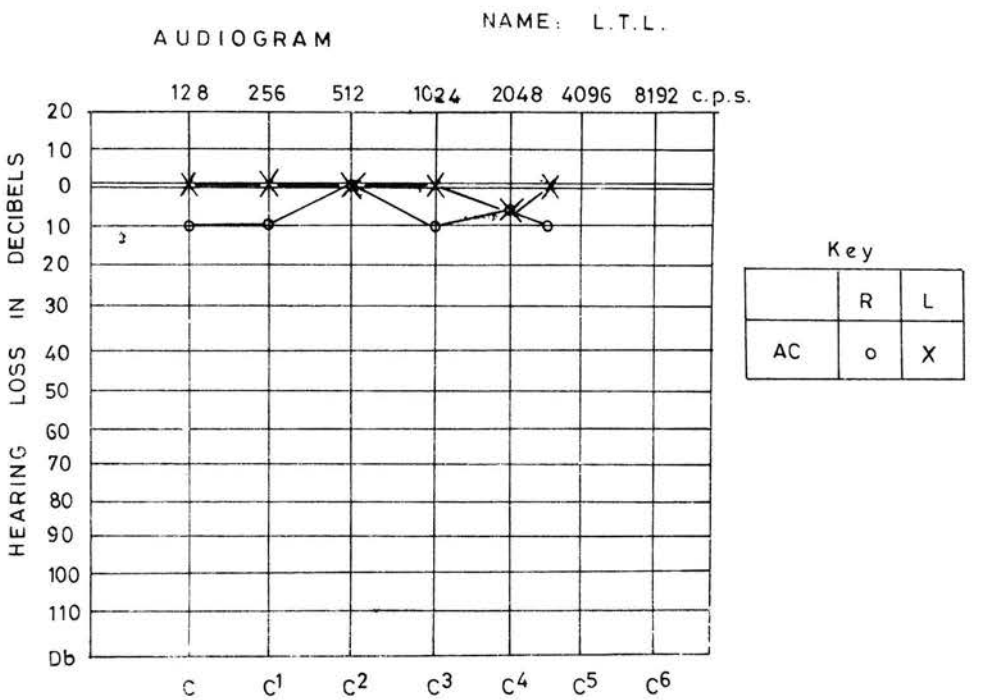

Fig. 6 Audiogram after 8 weeks.

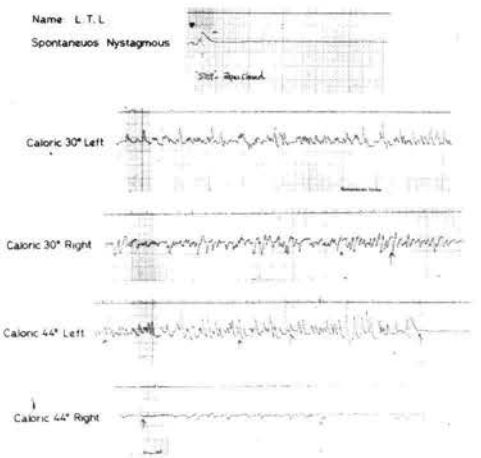

Fig. 7 Electronystagmograph after 8 weeks. Right canal response normal.

Discussion

It is important that all cases of facial paralysis should be accurately evaluated.

Taverner and Adour have shown that Corticosteroids or their precursers (A.C.T.H.) are very effective in the medical management of facial paralysis. The failure in recovery in most cases is because of late detection. Large doses of Cortisone should be given immediately and reduced in decreasing doses for a sufficient period of time. This reduces the oedema of the facial nerve.

Ballance and Dual (1932), and Crabtree (1968) have advocated surgical decompression in certain cases of Herpes Zoster oticus, where electrical tests reveal denervation. If surgical decompression is indicated, the choice of surgical procedures will be indicated by the site of the lesion.

Summary

A case of Ramsay Hunt syndrome with 7th and 8th nerve involvement is described here. Early detection and treatment with large doses of Cortisone had resulted in complete recovery of the cranial nerves within two months.

Acknowledgement

I wish to thank Miss Tan for secretarial assistance and the Medical Illustration Department for the photography.

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BOOK REVIEWS

HISTOLOGICAL TYPING OF SKIN TUMOURS

by R.E.J. Ten Seldam & E.B. Helwig, W.H.O., Geneva. 1974. 87 pp. and 176 colour illustrations. Sev. fr. 240. Available through W.H.O. Repr., P.O. Box 2550, Kuala Lumpur.

This is the twelveth volume in the series of tumour classifications published by W.H.O. It is a collaborative work with L.H. Sobin and H. Jorloni and pathologists from eleven countries. The classification includes five main categories of skin tumour and definitions and explanatory notes for each of the tumours and an index. It is intended to serve as the basis of a uniform terminology that will facilitate communication between scientists working in the field of cancer and stimulate comparative studies on the incidence of various tumours and collaborative clinical trials.

Most of the illustrations are available as a collection of colour transparencies intended especially for teaching purposes.

MANUAL ON PRACTICAL ENTOMOLOGY IN MALARIA.

Parts I & II, Offset publication. 160 and 191 pp. respectively Sw. Fr. 45 W.H.O., Geneva. Available through W.H.O. Repr., P. O. Box 2550, Kuala Lumpur.

Part I deals with the various factors that influence malaria transmission and covers the bionomies of mosquito populations, the organization of anti-malaria activities and the recording, reporting and interpretation of entomological data. Part II deals with the practical methods and techniques that the entomologist may require.

The publications are adequately illustrated with line drawings and photographs and will serve not only as a guide for entomologists but also as a teaching reference material which will give other malaria personnel a better understanding of the use and value of entomological procedures in the overall epidemiological appraisal.

PROCEEDINGS OF THE COLLOQUIUM IN NEPHROLOGY

Edited by P.H. Feng. Supplement to *Annals of Acad. Med.* S'pore. Vol. 4 No. 2. Apr. 1975 pp. 230.

This is a publication of the National Kidney Foundation, Singapore and records the proceedings of the colloquium in nephrology held in November 1974 in Singapore. The participants came from a wide area and as the Editor remarks, this coming together of minds and the crystallisation of ideas cannot help but further improve the standard of health care delivery and represent the first step towards regional cooperation which is so essential in all scientific endeavours.

PROCEEDINGS OF THE SECOND REGIONAL SEMINAR ON PSYCHOTROPIC MEDICATION

Edited by Jin-Inn Teoh. Supplement to *Med. J. Malaysia.* Vol. XXX No. 1. Sept 1975. pp. 171

This is the publication of the proceedings of the seminar organized by Malayan Neuro-psychiatric Society of the Malaysian Medical Association held in Kuala Lumpur in April 1974. It is the second of the series of seminars held in this region, the objective being to survey the progress made in the field of drug treatment of psychiatric disorders. In addition to papers in psychiatry, there were also papers in neurology and neurosurgery. Also presented were national reports on psychiatric services for Australia, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, United Kingdom and Vietnam.

There were also panel discussions on the following topics: Drugs and Behaviour, Psychiatric drugs and the General Practitioner, Modern Treatment of Parkinson's Disease, and Clinical Trials.

Correspondence:

A unified post-graduate medical organisation in Malaysia

Dear Sir,

With reference to your Editorial of 2nd December 1973 regarding post-graduate medical education and examinations, I am in entire agreement about the need for a unified body to draw up suitable syllabuses, organize training courses and conduct examinations for post-graduate diplomas in the various specialities.

In a country like Malaysia, where there are only about 240 specialists and 2 medical schools, it would be better to have all the specialities to be under one organisation rather than having a multiplicity of small groups trying to conduct courses and examinations and granting diplomas. This would also prevent a serious brain drain from our medical fraternity by offering our up and coming, bright young medical officers a future for persuing the speciality of their choice locally.

My proposal is that an Act of Parliament be passed known as the Academy of Medicine of Malaysia Act with ten Colleges or Faculties as they may be called constituted under the aegis of the Academy of Medicine. This would warrant the alternation of the Constitution of the Academy of Medicine in such a manner as to take in the ten Colleges or Faculties. The ten suggested are:

1. College of Surgeons
2. College of Medicine
3. College of Obstetricians and Gynaecologists
4. College of Dental Surgery
5. College of Anaesthesia
6. College of Pathology, Bacteriology and Medical and Laboratory Sciences
7. College of Social and Preventive Medicine
8. College of Radiology, Radiotherapy and Nuclear Medicine
9. College of General Practitioners or Family and Community Medicine
10. College of Psychological Medicine

It is important that we should take into the Academy of Medicine the College of General Practitioners. In the first instance we should take all the members of the College of General Practitioners approved by their Council as members, but, in the future, they should be admitted only by examinations conducted by their College in conjunction with the Academy of Medicine. Taking them in will strengthen the Academy and will enhance the standard of general practice as a whole. Many Universities overseas have established chairs in general practice because to a certain extent general practice itself is becoming a speciality in its own right.

These Colleges would remain independent to run their various specialities according to their own constitution. I would like to suggest that when the Constitution of the Academy is to be amended the ten Presidents of the Colleges become Council members of the Academy and six others to be elected at the Annual General Meeting of the Academy at which time the Master, the Scribe and the Burser would be also elected.

The Council of the Academy shall be responsible for conducting the examinations and helping the various courses especially, in regard to quality and standards. The respective Colleges would remain independent, but, there would be somewhat of a general control from the co-ordinating body of the Council of the Academy. The Academy can continue to hold its Bi-annual Congresses with the participation of all the Colleges. In this way, I am sure that we can unite all the Colleges and the Academy and the profession as a whole can speak with one voice. There are several details on methods of entry, type of awards etc. which can be discussed at a joint meeting. For example after obtaining the first and second part of the examination in the various Colleges, a Fellowship or Membership of the respective Colleges could be granted to the candidate. Following this the candidate would be required to serve in his or her speciality for three years, present a paper either at one of the bi-annual Congresses or recognised international meeting, following which

the A.M. could be conferred on them. With goodwill and the interests of the profession and the standard of medicine of our country at heart, it would not be difficult to formulate an Act, like the Academy of Medicine Act, wherein the power to control standards will rest with the Council of the Academy which would be elected by the medical profession.

Once such an Act is passed and a permanent secretariat is established, I am sure the whole project would be a success and not only gain recognition in our country, but, may also become a pattern, which other countries may like to adopt.

Yours sincerely.

Dr. G. Sreenevasan.
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