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EDITORIAL

"BUILDING THE NATION'S HEALTH"

"For the ambitious young doctor the glamour of consultant practice and the prestige and financial rewards of specialist status are powerful attractions, so much so that 91 of the 451 doctors in the Medical department have taken higher qualifications in clinical fields and many of them hold superscale appointments. Preventive Medicine it seems, has no such allure."

(from the Report on the Outbreak of Cholera in Malacca, 1963)

The Committee of Enquiry found that the basic weakness in our health service is that it does not attract the better type of doctor to choose Public Health as his career. As soon as the Report was published, the Government made a statement which was released on 8th January 1964. According to this statement the Government agreed to give the Diploma in Public Health the same status as other specialist medical qualifications, to create more posts of Senior Health Officers and to provide a fixed monthly allowance for the D.P.H. holders and others working in the field of preventive medicine. The year is coming to an end, but none of these things have been done. Perhaps it is time to appoint another Commission to enquire into the situation!

Public Health cannot gain its rightful place in the scheme of things unless there is proper support from the Government. One of the things that can be done is to make a proper selection when doctors are chosen to hold posts at Ministerial level. No one should be appointed at the national level unless he is suitably qualified, has shown some outstanding qualities of leadership and is dedicated to the task of building the nation's health.

The present health services in the country are centered around the hospital. It is in effect an **ill health service** and not a health service. Although numerous health centres have been built, it will be unusual to find any health centre that has its full complement of staff. It will be rarer still to find a medical officer, qualified in Public Health, working in any of these health centres. Unfortunately the whole Rural Health Service has been mainly a building programme. The vital problem of attracting good personnel has received little consideration.

Increased allowances and monetory attractions by themselves cannot change the situation, although they could be the first moves. There is an urgent need to teach Public Health in its right perspective to medical students. Those who are in charge of teaching Public Health must have had ample field experience before they assume the role of teachers. The teachers of preventive medicine must be actively interested in the national health programmes and serve as consultants and advisers in Ministerial committees.

It has become fashionable to pay lip service to Public Health. At annual general meetings, at opening ceremonies and on many other special occasions important people rise up and sing the praises of Public Health. It is time that some of this talk is followed by some action!

The saying that "Prevention is better than cure" has become an oft repeated slogan that has lost its meaning. One can almost hear the young doctors saying, "Prevention might be better than cure; but curative medicine is certainly more interesting, and it is more paying than Public Health." There is an urgent need to change this impression and restore Public Health to its rightful place. This is a challenge that faces not only those in the Ministry of Health, but every member of the medical profession.

The best medicine is preventive medicine! Every dollar spent in promoting the health of the people is a dollar that has been wisely invested. The hospitals in our country are full of people who would not have gone there except for the lack of preventive medicine. If one goes around the hospitals and makes a list of those suffering from preventable diseases it is most revealing. At least 70 to 80% of the cases could have been prevented. Preventive medicine is cheaper than curative medicine. It is morally our responsibility to prevent those diseases that can be prevented.

Technical knowledge is available for this type of work. It only needs willing hands to do the job. In the interest of the nation's health, let us work towards this goal!

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PATTERN OF ANAEMIA AND ITS EFFECTS ON PREGNANT WOMEN IN MALAYA

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The problem of anaemia in pregnancy is still the nightmare of practising Obstetricians in this country. In spite of increasing attention to maternal welfare and the opening of rural health centres and midwife clinics to serve the remote rural areas and the great stress on nutrition, the general standard of health is low and the incidence of anaemia high. Several factors are responsible, social, economic, educational, religious, racial.

(a) The common belief among all races that excessive and nutritious food give rise to big babies and difficult labours.

(b) Pregnancy is not looked upon as something that requires extra care and an adequate well balanced diet and antenatal examinations.

(c) A great deal of emphasis is placed on the taste of food rather than its nutritional value, and the role of food in the budget is made secondary to other comforts in life.

(d) Often the family is big and demands on the mother in the home are great, and she has no time to attend clinics earlier in pregnancy and regularly.

(e) The rural folk generally are timid and shy and need persuasion to make up their minds to attend the clinics.

There is no doubt that the standard of living has to be increased and with the increasing remuneration the level of nutrition of the population as a whole will be improved. At present with the increase in tempo of health education in the rural areas and the setting up of midwives clinics to every 2,000 of the population and regular home visiting the antenatal attendance is increasing.

Incidence

In order to assess the average haemoglobin level a survey was done on a thousand consecutive pregnant mothers attending the Maternity Hospital antenatal clinic, for the first time, and the results were as in Table I.

It must be noted that these patients are all town dwellers, and therefore in a better state of nutrition than the rural population.

The above figures give roughly the percentage of different racial groups attending the Maternity Hospital antenatal clinics. The Malays although they form 50 per cent of the population do not fully utilise the hospital services and form only 11.7% of this group of cases. The average haemoglobin for all was 68.8 per cent, the highest level being among the Europeans and others, and the lowest for the Indian patients. The latter generally suffer from the most severe anaemia seen in this hospital.

Roscoe and Donaldson (1946B) have suggested haemoglobin 76 per cent (Haldane) or 11 gm. per cent as the lowest limit of normality

TABLE I

Nationality	Number of Patients	Percentage	Average Hb. Sahli's
Chinese	400	37.2%	65.7
Indians	360	33.5%	65.6
Malaysians	128	11.7%	66.4
Others (Europeans, Eurasians, etc.)	188	17.6%	78.7
Total	1,074		68.7%

TABLE II

Incidence of severe Anaemia (1957 – 1961)

Total No. of Anaemia cases (below 6.5 gm.%)	1066
Total No. of Deliveries	46,912
Incidence of severe anaemia	2.2%

Year	Haemoglobin levels		
	0.0 — 2.49 gm.	2.5 — 4.9 gm.	5.0 — 6.5 gm.
1957	2	83	124
1958	1	86	113
1959	1	86	218
1960	5	62	150
1961	3	45	78
Total No. patients	12	362	683
Percentage	1.1%	33.9%	65%

during the later stages of pregnancy. After giving due allowance for physiological hydraemia and haemodilution and assessing the mothers on the above standard, 76.9 per cent of those attending the clinic should be classed as anaemic.

This figure is too numerous to be recorded on the Royal College of Obstetricians and Gynaecologists standard record book, and only those with haemoglobin of 6.5 gm. per cent and below were recorded as anaemia. Analysis of these severe anaemias which number 1066 cases for the years 1957 to 1961 is given above.

The majority of anaemic mothers were multiparous. Primigravida formed only 6 per cent of the total, thus emphasising that with increasing parity the tendency to anaemia is greater.

35 per cent of patients in this series had haemoglobin less than 5 gm. per cent.

Varieties of Anaemia

Accurate records of the types of anaemia are available in this survey, for the three years 1957 – 1959 and the diagnosis has been confirmed by bone marrow biopsies when required.

Microcytic Anaemia of Pregnancy

Microcytic anaemia is the commonest as expected and forms 76.27% of the total number of patients. Two main factors which combine to produce this picture are defective nutrition and iron deficiency.

(a) Defective nutrition

The diet usually is of a high carbohydrate and low protein content. Rice is the staple diet of all the three races and is consummed in relatively large quantities by the poorer social class. Though the caloric in-

TABLE III

Varieties of Anaemia

	1957	1958	1959	Total	Percentage
Microcytic Hypochromic	139	148	265	552	76.27
Di Morphic Anaemia	1	1	5	7	0.96
Macrocytic Anaemia	69	52	39	160	22.09
Haemolytic Anaemia	3	1	1	5	0.68

take may be high and iron present in sufficient quantities, the low content of calcium and the high content of phosphates in the rice creates the iron deficiency due to the formation of insoluble iron phosphates and phytates. Protein is essential in globin synthesis and the average intake falls far below that of 80 – 100 gms. of protein required daily during pregnancy. The main reason is an economic one, as protein foods are expensive. Therefore, emphasis must be made on increased consumption of cheaper forms of animal and vegetable protein, for example, soya bean, cake, pulses, fish, milk powder, etc.

(b) Iron deficiency

The average parous woman before conception occurs, is anaemic, loosing over 25 mgm. iron during normal menstrual periods. Approximately 500 mg. of iron are required in the course of pregnancy for the increase in maternal tissues and growth of foetus, and a further 400 mg. to compensate for the variable blood loss at birth and the needs of lactation. In addition there is a natural loss of 1 mg. iron excreted per day in faeces and urine and skin.

Iron deficiency may arise due to inadequate intake of iron, the average requirement being 15 – 20 mg. per day, defective absorption, increased demands for iron due to haemorrhage, infection and inhibition of the bone marrow.

(c) Hookworm infection is a potent and continuous cause of haemorrhage in the intestinal tract. Incidence of infection confirmed by stools was 14 per cent in this series. These figures are rather low and would be higher if repeated stool examinations were done. Sandosham (1955) in his analysis of hospital patients in Malaya records a figure of 30.6 per cent infection rate.

Blood loss from this cause has been determined by 51 Cr red cell labelling method by Tasker (1961). A daily haemorrhage of 8 ml. to 90 ml. occured depending on the degree of infestation. At normal haemoglobin levels iron loss varies between 1 mgm. and 40 mg. per day. Therefore, on a marginal dietary intake of iron such a loss could result in a negative iron balance.

2. Macrocytic Anaemia of Pregnancy

The literature on megaloblastic anaemia is enormous and briefly it may be summarised as follows:—

Nucleic acid which is essential for development of nuclei of cells is formed from amino acids. Folinic acid formed by the reduction of folic acid which is found in fresh leafy vegetables and also produced by bacterial metabolism in the gut, acts as coenzyme in conversion of amino acids to purines and pyramidines which in turn form nucleosides and nucleotides with the coenzyme vitamin B_{12}.

During pregnancy with increasing growth of the foetus, especially in the last trimester, the demand for folic acid is increased. Maternal serum and urinary levels of vitamin B_{12} tend to fall during the course of pregnancy and the clearance of intravenously injected folic acid increases in normal pregnancy and even more so in megaloblastic anaemia, suggesting folic acid deficiency (Chanarin Gibbon, 1958). Further at delivery, infants serum levels of vitamin B_{12} and folic acid are generally found to be considerably higher than the mothers, indicating that dietary resources are inadequate to meet the needs of the mother and this is an important factor in the aetiology of megaloblastic anaemia.

There is derangement of red cell maturation and abnormal nucleated precursor cells are found in the bone marrow. The peripheral blood shows megaloblastic hypochromic anaemia without reticulocytosis and there is considerable variation in size and shape of cells. Megaloblasts are not usually seen in the peripheral blood but can be demonstrated in most cases in the films made from the leucocytic layer after centrifugation. Unless these are demonstrated, bone marrow examination must be done before specific treatment is instituted, otherwise the diagnosis becomes difficult, if not impossible.

The Effects of pregnancy on the Anaemia

The effects on the mother depend mainly on the severity and duration of anaemia. With moderate degrees of anaemia the patient is able to carry on her daily activities and any limitation of this is usually attributed to

the pregnancy itself. The commonest symptoms were generally anorexia, lassitude, giddiness, pallor, breathlessness with oedema, paraesthesia, and soreness of the tongue and angles of the mouth in advanced cases. Even in severe cases one is surprised how the pregnant mothers with 6.5 gm.% haemoglobin, are able to go about their daily work, and attend the clinics from long distances. Even more shocking is that group below 5 gm.% haemoglobin who show their ability to live with such low haemoglobin levels, and go about their daily domestic duties without much handicap. As pregnancy progresses, anaemia becomes worse, with evidence of heart failure.

Macrocytic anaemia is generally noted in the third trimester when there is rapid growth in the weight of the foetus, and folic acid requirement is high. The onset is often gradual, but may be acute with pyrexia often precipitated by toxaemia haemorrhages. Gastro intestinal symptoms tend to occur and splenomegaly and hepatomegaly may be present.

Spontaneous improvement tends to occur after parturition but treatment with folic acid should be continued in the puerperium until the picture has become normal for 2 months.

Effects of anaemia in Pregnancy, Labour and Puerperium

1. Abortions

Spontaneous termination of pregnancy before 28 weeks occured in only 21 patients, giving an incidence of 4.12 per cent which shows that anaemia does not give rise to an increase in abortion rates.

2. Pre-eclamptic toxaemia

Anaemia is said to predispose to pre-eclamptic toxaemia (Moore and Phillman Williams, 1936). The following table illustrates this:—

There is a statistically significant increase in pre-eclamptic toxaemia, the incidence being 7.5 per cent as against 4.5 per cent, the overall incidence for all cases admitted into this hospital.

3. Accidental Haemorrhage

There were 18 cases of accidental haemorrhage giving an incidence of 1.6 per cent which is about the average occurence of abruptio placenta (Allen Brews and Bender).

4. Placenta praevia

This showed no increased incidence and occurred in 0.4 per cent of patients in this series.

5. Premature labour

Excluding such other causes of premature labour as pre-eclamptic toxaemia, twin pregnancies, foetal abnormalities, antepartum haemorrhages, there is a high incidence with no other obvious cause except presence of anaemia.

This high incidence of premature labour is without doubt correlated with defective nutrition. This is borne out by investigations of the Peoples League of health investigation (1938), which showed a statistical significant decrease in prematurity rate in patients whose diet was supplemented with calcium, iron and vitamins. However, during the war years in Britain due to full employment and an enlightened food policy a fall in prematurity rate, especially in cases of prematurity, cause "unknown," occured in conditions without doubt related to maternal health (Duncan, Baird, Thomson, 1952).

Pre-eclamptic toxaemia

	Total No. of anaemias	Mild and Moderate	Severe	Total	Incidence
1960	212	3	9	12	5.7%
1961	126	5	7	12	9.3%
1962	172	9	5	14	8.2%
Overall incidence = 7.5%					

Duration of Pregnancy

	Term	36–39 weeks	28–36	Less than 28		Total
1960	32	118	47	6	9	212
1961	31	62	20	2	11	126
1962	19	115	26	4	8	172
	82	295	93	12	28	510
Total	16.1%	57.8%	18%	2.4%	5.6%	

The above figures indicate that only 16.1 per cent in this series went to full term, the majority delivered between 36 and 39 weeks while 18.2 per cent delivered between 28 to 36 weeks.

6. Duration of labour

Although progress of labour is governed by many factors, by both physiological and obstetrical complications, the majority of the patients delivered in 24 hours. The patients seen for the first time in labour are carefully observed with suitably matched and packed blood cells available for use at a moments notice. Transfusion is given only when there is a haemorrhage during or after delivery. The experience generally is that anaemic patients have easy, quick and spontaneous labours illustrated by the table below:—

7. Forceps delivery

The incidence was 2.9 per cent much lower than the 10 per cent overall incidence. This is due to high incidence of premature labour and small sized babies.

8. Postpartum Haemorrhage

The incidence is low as well as the amount of loss. In assessing postpartum haemorrhage as a blood loss of 20 Ozs. or more, the incidence is 1.51%.

Duration of Labour

	MULTIPARA		PRIMIGRAVIDA		
	Less than 12 hours	More than 12 hours	Less than 24 hours	More than 24 hours	Total
1960	178	9	11	2	200
1961	83	24	4	0	111
1962	122	31	7	4	164
	383	64	22	6	475
Multipara	85.9%	14.1%	88.5%	11.5%	

	Total No. of Cases	Blood loss 10 to 20 Ozs.	Postpartum haemorrhage Blood loss. 20 Ozs.+
1960	212	4	nil
1961	126	24	4
1962	172	10	4
	510	38	8 (1.51%)

The patients generally were more prone to shock, the loss of even 10 ounces of blood gave rise to signs and symptoms of shock and the need for blood transfusion was greater. Suitably matched and packed blood cells is always kept readily available for use at a moment's notice.

9. Puerperal pyrexia

84 patients (16.5 per cent) had puerperal pyrexia which is a high incidence.

Malnutrition and anaemia cause a general lowering of tissue response to infection, and increased morbidity (Bickerstaff, 1942). With the use of antibiotics, this complication is easily treated but convalescence is generally prolonged.

10. Phlebo-thrombosis

There were no cases of phlebothrombosis in this series. The incidence of Phlebothrombosis among pregnant mothers is very low in all races although the incidence of varicosities is the same as in European countries. With the increased rate of febrile morbidity in the puerperium one would expect an increased incidence of phlebothrombosis, but there were no such cases in this series.

Effect of pregnancy on the foetus

1. The weights of foetuses generally are lower than in comparable women of good nutrition. 58 per cent of babies born to anaemic mothers were more than 5½ pounds (2500 grams) and above and 182 (17.1 per cent) were below 4½ pounds (1500 gm.). This has resulted in a perinatal mortality of 15.5 per cent. The breakdown of these figures is as follows:—

Foetal Weights

	Up to 4½ lbs.	4½–5½ lbs.	5½–6½ lbs	6½ lbs.
1957	37	53	56	60
1958	41	48	60	53
1959	41	90	97	80
1960	27	48	69	68
1961	36	26	36	37
Total	182	265	318	298

2. Foetal loss associated with anaemia (1957 - 1961) in 1066 cases.

	Mature	Premature	Previable	Abortion	Total
Neonatal deaths	11	36	5	0	52
F. S. B.	39	27	4	0	70
M. S. B.	11	9	2	0	22
Aborted	0	0	0	21	21
Total	61	72	11	21	165

The foetal loss of foetuses was 15.5 per cent. The perinatal mortality is higher. 61 foetuses died at term. Of these 50 were stillborn, 72 were prematurely delivered and 36 were stillborn. Thus there is definite evidence that there is a greater perinatal mortality, and increased incidence of stillbirths. The main factor is anoxia in utero.

The factors that determine the stillborn and neonatal mortality are complex. D. Baird's (1945, 1947) observations in Aberdeen support the view that the child's prospects both before and after birth are greatly influenced by the health of the mother during pregnancy, and it is probable that suitable and satisfactory environmental conditions along with antenatal

and obstetrical care will result in a lower perinatal mortality.

In anaemic mothers there is a greater risk of anoxia to the foetus developing in utero and accentuated during the process of labour, thereby causing intra uterine death and fresh stillbirths. Further the increase in premature labours with 42 per cent of babies below 5½ pounds (2,500 grams) has considerably increased the total foetal loss to 15.5 per cent.

3. Twin pregnancies

There is an increased number of twin pregnancies in this series giving an incidence of 2.9 per cent.

4. Congenital abnormalities

There were only 2 skeletal abnormalities out of 510 severe anaemias (1962), an incidence of 0.93 per cent. Therefore, anaemia does not seem to increase the incidence of developmental abnormalities. It is quite probable that these patients were not so anaemic earlier in the first trimester when there is active organo-genesis, when anoxia may be a contributing factor to abnormal development.

Maternal mortality

There were 13 deaths in this series of 1066 severe anaemias, an incidence of 12.1 per thousand. All of them were seen as emergencies for the first time with little or no antenatal care. Causes of deaths were as follows:—

Anaemia cardiac failure	6
Anaemia enteritis	2
Anaemia with severe pre-eclampsia ...	1
Anaemia and antepartum haemorrhage	1
Anaemia with hydatidiform mole ...	1
Anaemia, obstetric shock	1
Total ...	12

The main cause of death as seen above is anaemia with cardiac failure. The general rule is to treat the cardiac failure and no active intervention is done with respect to delivery. Pregnancy is allowed to take its natural course. Packed cell blood transfusions are reserved for use only in cases seen in the last four weeks of pregnancy and even then small transfusions are given. General transfusions are avoided during labour and given only when there is a postpartum haemorrhage. Prophylactic intravenous ergometrine is given with the delivery of the head. Anaemic patients do not tolerate transfusion well, but if it has to be given, then great care must be taken to give packed red cells very slowly, watching for reactions and early evidence of overloading and cardiac failure recognisable by distension of the external jugular veins.

Exchange transfusions appear to be the method of choice, i.e., replacing with blood of high Haemoglobin content without increasing total blood volume, thereby not overloading the heart.

Summary

1066 cases of severe anaemias of pregnancy (6.5 gm. and under) admitted into the Maternity Hospital, Kuala Lumpur, during the years 1957 - 1961 have been reviewed.

22.09 per cent of them (1957 - 1959) were macrocytic anaemia of pregnancy.

There is definite evidence of increase in the incidence of pre-eclamptic toxaemia, twin pregnancies, premature labour, puerperal pyrexia and premature babies, as well as increased perinatal mortality and maternal mortality.

There is urgent deed to detect and treat this all important condition of anaemia in pregnancy. We are given ample time, that is 9 months to treat these patients, and there should be no difficulty to bring them to an optimum state of physical fitness to bear the stress of parturition.

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GALLOWAY MEMORIAL LECTURE — 1964 *

AMNIOTOMY IN THE TREATMENT OF PLACENTAL INSUFFICIENCY SYNDROME

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PART I — Concept of the Placental Insufficiency Syndrome and Review of Literature.

The Master, Ladies and Gentlemen,

Sir David Galloway can be said to be the pioneer of western medicine in Malaysia, and was one of the founders of this medical school, from which I am privileged to have graduated just over 50 years later. There is yet one other factor in common between Sir David Galloway and the Galloway Memorial Lecturer for 1964. Sir David was a Scotsman by birth, and had his medical education in Scotland; and I too was privileged to have undertaken postgraduate studies and research in obstetrics and gynaecology in Scotland, under the wise guidance of Professor Sir Dugald Baird, Regius Professor of Midwifery, Aberdeen University. Sir Dugald is also a Scotsman by birth, who has dedicated his life to research in obstetrics and gynaecology. Sir Dugald is probably the leading personality in the field of obstetrics and gynaecology in the Commonwealth, if not in the world, at present. Most of what I have to say, this evening, is the reflection of his impact on modern obstetrics.

I am deeply conscious of this honour that has been bestowed upon me by the Singapore Academy of Medicine in inviting me to deliver the Galloway Memorial Lecture for 1964.

Introduction

The last few decades have seen the steady decline of perinatal mortality all over the world, in general. With the reduction of the previous common causes such as prematurity, traumatic births and infections, the placental insufficiency syndrome, with its sequelae of intra-uterine asphyxia, has come to the forefront as the leading cause of perinatal mortality. In the United Kingdom, a national perinatal mortality survey was carried out under the auspices of the National Birthday Trust Fund in 1958. In this survey, during the specified period of one week, 3rd to 9th March 1958, complete clinical data were obtained from over 98 per cent of all the births, and autopsy studies were performed in about 88 per cent of all the perinatal deaths. Claireaux (1961, 1963) reviewed the data from this National Survey, and showed that the placental insufficiency syndrome was the leading cause of perinatal mortality, being responsible, either directly or indirectly, for over 30 per cent of all the perinatal deaths.

Definition

Although our attention has been drawn to this syndrome in current publications, there has been no attempt made to put forth a clear cut concept. The following is my personal concept of the "placental insufficiency syndrome."

"The Placental Insufficiency Syndrome is a state of dysfunction of the placenta in which there is poor overall growth or premature degeneration of the placenta, with resultant reduction in the placental reserve state, to such an extent as to be a danger to the foetus. This danger can manifest itself by retarded intrauterine foetal growth, foetal cachexia, or by a state of intrapartum foetal anoxia, any

* Galloway Memorial Lecture (1964) — Part I, which was delivered to the Academy of Medicine, Singapore, on the 27th August, 1964.

one of which may predispose to perinatal death from asphyxia, intracranial haemorrhage or infection."

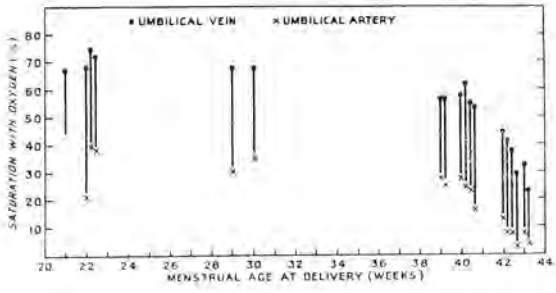
Historical and Experimental Review:

As early as 1934, Sir Joseph Barcroft and his colleagues, working on goat and sheep foetus, had shown that the foetal haemoglobin oxygen saturation deteriorated as pregnancy proceeded towards and beyond, the normal term. Again in 1945, Barcroft and Young showed that in the rabbit foetus, there is evidence of deficient oxygen saturation with special reference to postmaturity. McKiddie (1949) suggested specifically that a falling oxygen supply might explain some of the special features seen in his cases of prolonged pregnancy syndrome.

In 1949, guided by the work of Barcroft, and stimulated by the clinical findings of McKiddie, Walker and Turnbull in Aberdeen conducted extensive studies on the oxygen saturation in the cord blood of the human foetus, and in 1953 they published their findings, which showed that the average oxygen saturation of foetal haemoglobin was about 70 per cent at the 30th week of gestation, and with the advance of gestation the oxygen saturation steadily fell to reach 60 per cent at the 40th week, but thereafter the fall was very steep — the oxygen saturation being only 30 per cent at the 43rd week of gestation. They concluded that the excess of foetal death in prolonged pregnancy could be due to a falling oxygen supply.

Fig. 1

Shows the oxygen saturation of blood in the foetal umbilical vein and artery at different periods of gestation.



(After Walker & Turnbull, (1953) — Lancet Vol. 2, 312).

At about the same time as Walker and Turnbull, Browne and Veal were conducting Uterine (chorio-decidual) blood flow studies in both normal human pregnancy and in cases of pre-eclampsia and chronic hypertension, with the aid of radio-active Na^{24}isotope. They (1953) stated that the average uterine blood flow in normal pregnancy at the 38th week of gestation was about 600ml. per minute, but that in toxaemia and chronic hypertension, the blood flow was reduced to as low as 200ml. per minute before foetal loss occurred. They concluded, therefore, that under normal conditions, the placenta has a considerable functional reserve status.

Pathology of Placental Failure:

TABLE I

Classification of Placental Failure

MATERNAL CAUSES:
1. Defects in Utero-Decidual Circulation.
2. Defects in Chorio-Decidual Circulation.
FOETAL CAUSES:
1. Gross Placental Atrophy or Infarction.
2. Trophoblastic Atrophy in the Chorionic Villi.

The pathology of placental failure can be either of maternal or foetal origin. From the maternal aspect, the failure can be due to defects in the utero-decidual, or in the chorio-decidual circulation, such as occurs in the elderly primigravida, chronic hypertension and uterine scars. From the foetal aspect, the placental failure could be due either to gross placental infarction or to trophoblastic atrophy in the chorionic villi, such as occurs in prolonged pregnancy (postmaturity), toxaemia of pregnancy, and diabetes mellitus. However, there is a close inter-relationship between the maternal and foetal aspects of placental failure.

Scott Russell (1963) has pointed out that attempts to correlate placental histology and the clinical picture have proved very disappointing; and that a foetus can die despite reasonably normal histology in the placenta,

or live despite serious faults. He pointed out that the outstanding contribution of morbid histology to placental function has been the clear demonstration of the changing placental structure as pregnancy advances, and the consequent inference that the placental function also changes.

Aetiology:

Clinically, the aetiology of the placental insufficiency syndrome can be broadly divided into two groups — the first group represents those conditions where there is little doubt as to the occurrence of placental insufficiency, and where the state of placental insufficiency is usually of a major degree. The second group represents those conditions where the extent of placental insufficiency is variable, and often of a minor degree.

TABLE II

Aetiology of Major Degrees of Placental Insufficiency Syndrome.

1. Postmaturity Syndrome (Prolonged Pregnancy).
2. Pre-Eclampsia/Eclampsia Syndrome.
3. Chronic Hypertensive Vascular Disease.
4. Pyelonephritis.
5. Diabetes Mellitus.
6. Elderly Primigravida.

(a) **Major Aetiological Factors:**

(i) **Postmaturity Syndrome:**

There is little doubt in the mind of the practical obstetrician that the postmaturity syndrome or prolonged pregnancy does exist, and is still a major contributor to perinatal mortality and morbidity. Barcroft and his colleagues (1934, 1945) have displayed this problem in the goat, sheep and rabbit foetus. McKiddie (1949), Walker and his colleagues (1953, 1958), and Browne (1961, 1963) have in a masterly way surveyed the extent of this problem in the human pregnancy.

Walker (1958) had categorically enunciated that the three cardinal hazards of the postmaturity syndrome are:—

(1) a rise in the perinatal mortality,

(2) an increasing incidence of foetal distress, and

(3) an increasing incidence of difficult and operative delivery.

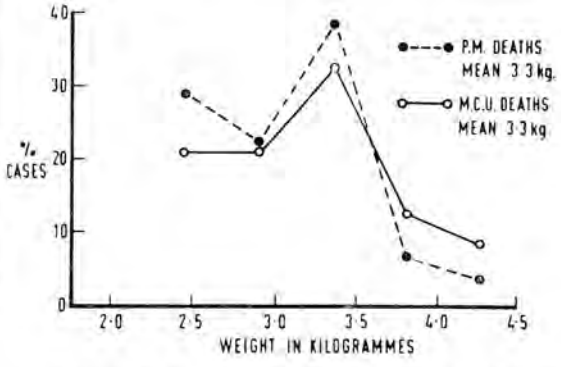
He had further stressed that it was extremely important to realize that each of these three factors was an integral part of the syndrome, since they were closely interwoven clinically, and in many aspects interdependent.

Browne (1963) in his Joseph-Price Oration, four years later, came to similar conclusions, and his results are summarised in the following graphs:

Fig. 2

Relationship of Birth-Weight to Foetal Maturity

The figure shows the average weights of perinatal deaths in postmature and mature full-term pregnancies.

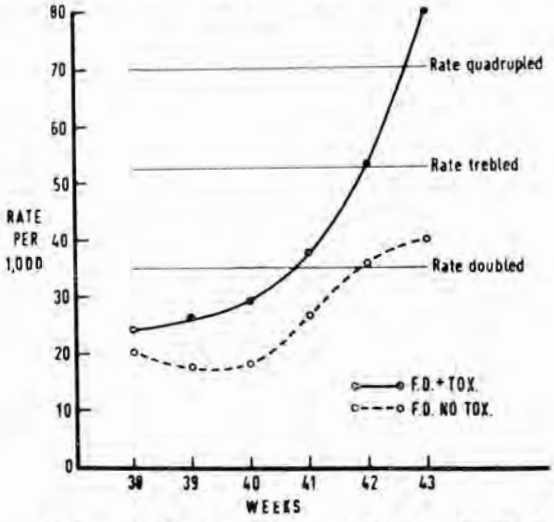


(After J. C. M. Browne (1963) — Amer. J. Obstet. & Gynae., **85**, 573. With the courtesy of the publishers — The C. V. Mosby Company).

The above figure shows that there is little difference in the birth-weights of perinatal deaths in mature and postmature pregnancies. Hence, it is fallacious to infer that because the dead foetus is of average size, it could not be a postmature death. In fact, a postmature foetal death may, in some instances, be of low birth-weight.

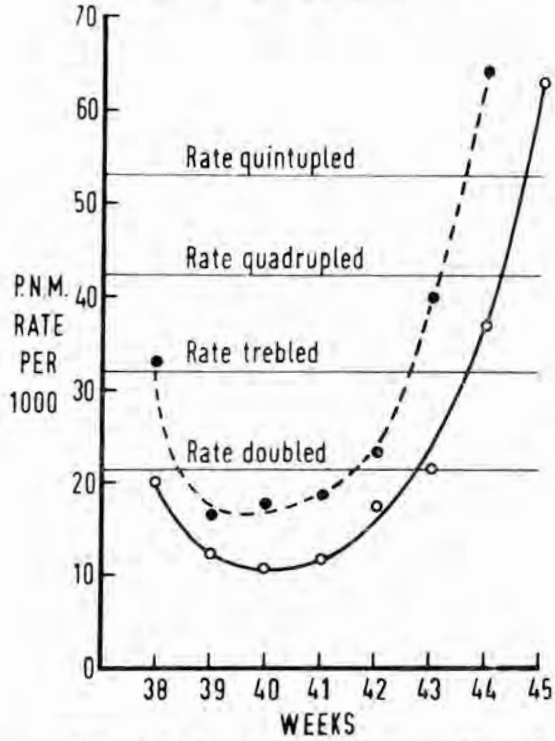
Figure 3. Shows that the incidence of foetal distress rises very sharply in the postmature pregnancy, and this is especially marked, if there is co-existing toxaemia of pregnancy.

Fig. 3
Relationship of Foetal Distress to Foetal Maturity and Toxaemia.



(After J. C. M. Browne (1963) — Amer. J. Obstet. & Gynae., **85**, 573. With the courtesy of the publishers — The C. V. Mosby Company).

Fig. 4
Relationship of Perinatal Mortality to Foetal Maturity and Toxaemia.



(After J. C. M. Browne (1963) — Amer. J. Obstet. & Gynae., **85**, 573. With the courtesy of the publishers — The C. V. Mosby Company).

Figure 4. Shows that there is a steep increase in perinatal mortality in pregnancies prolonged beyond the 42nd week of gestation, and this feature is more marked when there is co-existing toxaemia of pregnancy.

(ii) **Pre-Eclampsia/Eclampsia Syndrome:**

The above combination represents the true toxaemia of pregnancy, and there is little doubt that toxaemia of pregnancy predisposes to the placental insufficiency syndrome. Gross placental degenerative changes is a constant feature of moderate and severe toxaemia of pregnancy. Figures 3 and 4 from Browne's (1963) paper clearly indicate that toxaemia of pregnancy predisposes to a higher incidence of foetal distress and perinatal mortality, and this is more so, when there is co-existent postmaturity.

(iii) **Chronic Hypertensive Vascular Disease:**

Chronic hypertension, in the pregnant mother, predisposes to the severe forms of placental insufficiency syndrome, either directly by precipitating placental infarctions, or indirectly by predisposing to toxaemia of pregnancy. Townsend (1963), and Bourne and Williams (1962) have drawn our attention to this problem.

(iv) **Pyelonephritis:**

Chronic pyelonephritis is often associated with secondary hypertension, which can predispose to placental insufficiency. The high perinatal mortality rates that co-exist with chronic pyelonephritis is only partly due to placental insufficiency.

(v) **Diabetes Mellitus:**

There is some degree of controversy as to whether placental insufficiency is a feature of diabetic pregnancies. Scott Russell (1963), Robertson et al (1963), and Eddie (1963) have found that, in the pregnant diabetic patient, the estimation of urinary oestriol and pregnanediol excretion is seldom of any guide in the detection or management of placental insufficiency state. Russell (1963) categorically stated that in the diabetic pregnancy, the

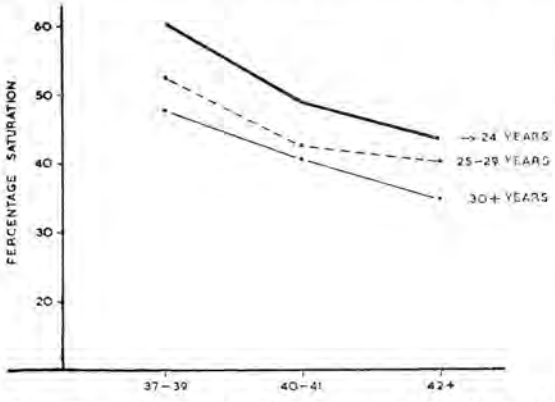
placenta, although often large, was inadequate to meet foetal requirements of oxygen and nutrition. He further stated that presumably the risk to the foetus in maternal diabetes was metabolic, and not hormonal, and was hence not reflected in altered hormonal excretions.

(vi) Elderly Primigravida:

Turnbull and Baird (1957) conducted controlled scientific studies in the human pregnancy and found that the average oxygen saturation of foetal haemoglobin became less as maternal age and the length of gestation increased, and was sometimes dangerously low, especially in primiparae aged 30 or more, delivered after the 41st week of gestation. They then postulated that the relatively high rate of perinatal mortality in the elderly primigravidae — often clinically unexplained and accompanied by postmortem evidence of foetal asphyxia — is due in part to inadequate foetal oxygenation after term.

Fig. 5

Relationship of oxygen saturation in Foetal Haemoglobin to maternal age and duration of gestation.



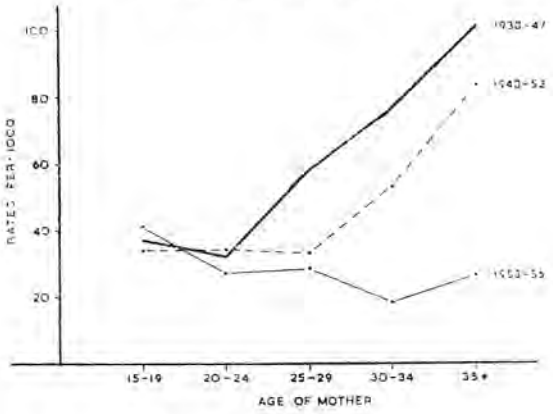
This figure shows a falling oxygen saturation of Foetal Haemoglobin with increasing age of patient and maturity of pregnancy.

(After Turnbull and Baird (1957) — Brit. Med. J., **2**, 1021).

In the light of these findings, Baird, in 1953, implemented a policy at the Aberdeen Maternity Hospital, whereby labour has been induced routinely by artificial rupture of the membranes in primigravidae aged 25 or more and who are undelivered before the end of the 41st week of gestation.

Fig. 6

Falling Perinatal Mortality Rates with Policy of Surgical Induction.



(After Turnbull and Baird (1957) — Brit. Med. J., **2**, 1021).

The above figure shows that as a result of the above policy, there was a steep fall in the perinatal mortality rates in the elderly primigravidae, during the years 1953-6, to such an extent as to eliminate the excess of perinatal deaths.

TABLE III

Aetiology of Minor Degrees of Placental Insufficiency Syndrome

1. Unexplained Past Perinatal Death.
2. Habitual Abortion (Unexplained).
3. Prolonged Involuntary Infertility.
4. Threatened Abortion/Antepartum Haemorrhage.
5. Multiple Pregnancy.
6. Previous Uterine Scar { L.S.C.S. / C.C.S. / Myomectomy

(b) Minor Aetiological Factors:

(i) Unexplained Past Perinatal Death:

It is an accepted belief that certain types of women are poor obstetric performers, and that patients who have had a past perinatal death of unexplained aetiology, are more susceptible to a recurrence of this status. In such instances it is probable that placental insufficiency,

of unexplained basis, may be the underlying factor.

(ii) **Unexplained Habitual Abortions:**

Those authorities, who are advocates of the placental insufficiency syndrome, believe that patients with a history of unexplained habitual abortions, have a greater tendency to develop a state of placental insufficiency in their subsequent pregnancies. It is possible that minor aberrations in the genes (sperm or ovum), which could lead to such cases of unexplained habitual abortions, could also be responsible for the production of defects in the state of placental structure and function. However, placental insufficiency status does not co-exist with every case of habitual abortion.

(iii) **Prolonged Involuntary Infertility:**

Those women, who have had prolonged involuntary infertility, are said to have a higher tendency to develop the placental insufficiency syndrome. Statistically there is evidence that such patients have a higher incidence of unexplained foetal distress and asphyxial perinatal deaths.

(iv) **Threatened Abortions/Antepartum Haemorrhage:**

It is a well accepted fact that patients with episodes of placental haemorrhage in any period of their pregnancy do tend to sustain varying degrees of placental damage, even though the pregnancy proceeds to term. But whether any such particular case does sustain that degree of placental damage, so as to produce a state of placental insufficiency, is often difficult to ascertain.

(v) **Multiple Pregnancy:**

Most authorities, subscribing to the concept of placental insufficiency, do accept the fact that patients, with multiple pregnancy, tend to run a higher risk of developing placental insufficiency. In fact, McClure Browne (1962) categorically states that the optimal duration for twin pregnancy is 38 weeks and not 40 weeks. He even goes so far as to advocate termination of uncomplicated twin pregnancies, soon after the 38th week of gestation, based upon his strong suspicions, which he has yet not been able to substantiate. However, most other authorities are prepared to await the 40th week of gestation, before considering the termination of uncomplicated twin pregnancies.

(vi) **Previous Uterine Scar:**

The ardent advocates of the placental insufficiency syndrome postulate that patients who have had a scar in the uterus, be it lower segment caesarean section, classical caesarean section, or myomectomy, do run a higher risk of developing the placental insufficiency syndrome, in their subsequent pregnancies. There is some reason to believe that this may be so in those cases where the placenta becomes implanted over the site of uterine scar, and hence become impaired in blood supply. But each case should be assessed on its individual merit, as to the state of placental function.

DIAGNOSIS:

Clinical Aids to Diagnosis:

TABLE IV

Clinical Aids in the Diagnosis of the Placental Insufficiency Syndrome

1. Clinical History.
2. Weight Changes in Pregnancy.
3. Alterations in the Uterine Size.
4. Alterations in the Volume of Liquor Amnii.
5. Unexplained Evidence of Foetal Distress in Labour.

(i) **Clinical History:**

Just as in other fields of medical practice, the clinical history serves as an invaluable aid to the diagnosis of a possible state of placental insufficiency in any particular pregnancy. From the clinical point of view the presence of any one of the clinical conditions listed in Tables II and

III should make the obstetrician aware of the possibility of the state of placental insufficiency. These clinical conditions have been described in some detail, and hence nothing further need be said.

(ii) **Weight Changes in Pregnancy:**

Weight changes in normal pregnancy have been exhaustively studied in the various centres of the United Kingdom. It is stated that the average weight-gain throughout pregnancy in an average sized British woman is of the order of 24 pounds, and that in the last 4 weeks of pregnancy, weight is gained at the rate of about 1 pound per week (Browne 1962). Thomson and Billewicz (1957) from Aberdeen have stated that the mean normal weight-gain for the whole of pregnancy in Scottish women was 27.6 pounds (12.5 kgm.). However, in Malaysia, the women and newborn babies tend to be smaller and my guess is that the probable average total weight-gain would be about 18 pounds ± 4 pounds. Hauck (1963) had estimated the average total weight-gain in the Nigerian pregnant woman to be around 12 pounds.

It is stated that in those cases of placental insufficiency syndrome, the normal weight-gain pattern is not maintained (Browne 1962), and that one or more of the following abnormal patterns may be observed:

(a) overall weight-gain in the entire pregnancy may be much less than normal;

(b) weight-gain ceases, and the weight becomes static;

(c) there may even be an actual loss of weight of 1 or 2 pounds near term.

When the above weight pattern prevails, and there is no other explanation, such as vomiting, diarrhoea, or diet restriction, it is stated that foetal death is likely to occur within the next 10 days or so (Browne 1962). Hence, a cessation of weight-gain or a weight-loss may indicate the necessity for early delivery.

(iii) **Alterations in the Uterine Size:**

Browne (1962) stated that the girth of the abdomen at term is on the average 40 inches, and at 36 weeks it is 36 inches, when measured at the umbilicus. This measurement can be taken as an index of uterine size, although due allowance must be made for any obesity. If the abdominal girth, which has been increasing steadily, begins to diminish, this again is an indication that placental insufficiency is impending and that the child should be delivered soon.

(iv) **Alterations in the Volume of Liquor Amnii:**

Wrigley (1945) in discussing postmaturity pointed out that the same observer palpating the uterus daily may detect a diminution in the amount of liquor amnii within the uterine cavity. A decrease in the volume of liquor amnii, and a relative increase in the ratio of foetal volume to liquor amnii volume within the uterus is an accepted feature of impending placental insufficiency, and may indicate the necessity for delivery. Further, if at amniotomy, there is observed to be very scanty or no liquor, it is an ill-omen; and very strict vigilance during labour, or even an urgent caesarean section may be called for, to salvage the foetus.

(v) **Unexplained Evidence of Foetal Distress in Labour:**

The presence of unexplained signs of foetal distress in early labour should make the obstetrician suspect the presence of placental insufficiency syndrome, especially so if there is a co-existing clinical history as outlined earlier. The foetal distress may manifest itself either by meconium stained liquor before labour pains ensue, or by the slowing or irregularity of the foetal heart sounds in the first stage of labour. Scott Russell (1962) had stated that under normal circumstances, there should be no alterations to the foetal heart-sounds during the uterine contractions of the first stage of labour,

and that if slowing was observed then this pointed to abnormality.

Ancilliary Aids to Diagnosis:

TABLE V

Ancilliary Laboratory Aids in the Diagnosis of the Placental Insufficiency Syndrome

1. Oestriol Studies in Blood/Urine.
2. Progesterone/Pregnanediol Studies in Blood/Urine.
3. Liquor Amnii Volume Studies.
4. Vaginal Cytological Studies.
5. Iso-Citric Dehydrogenase Enzyme Studies.

(i) Oestriol Studies in Blood/Urine:

Klopper et al (1961), Coyle et al (1962), Coyle and Brown (1963), Banerjea (1962), and Kellar et al (1959) have all shown that placental function can be evaluated by conducting urinary oestriol studies. Similarly, Roy et al (1963) have shown that placental function can also be evaluated by conducting blood oestriol studies. However, all authorities in this sphere of research have emphasized that isolated urinary/blood oestriol studies are of no value in prognosticating placental function, whereas serial studies in any particular patient can be useful to evaluate the state of placental function.

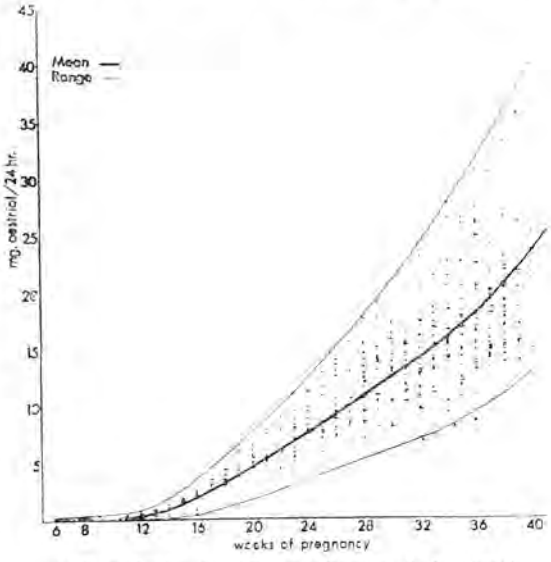
Figure 7 shows the usual pattern of urinary oestriol excretions in 36 normal pregnancies. This table is taken from the excellent publication of Coyle and Brown (1963).

Figure 8. Shows the abnormal pattern of urinary oestriol excretions with falling levels in a patient who developed pre-eclampsia at the 33rd week of gestation. She then developed an accidental haemorrhage and delivered herself at the 37th week of a devitalised 5 pounds 9¼ ounces baby which died within a few hours of birth. It is interesting to note that there was clear cut evidence of falling urinary oestriol levels about 4 to 6 weeks before accidental haemorrhage, and foetal death ensued.

Fig. 7

Normal Urinary Oestriol Levels.

This figure shows a steady increase in Urinary Oestriol levels with the advance of pregnancy.

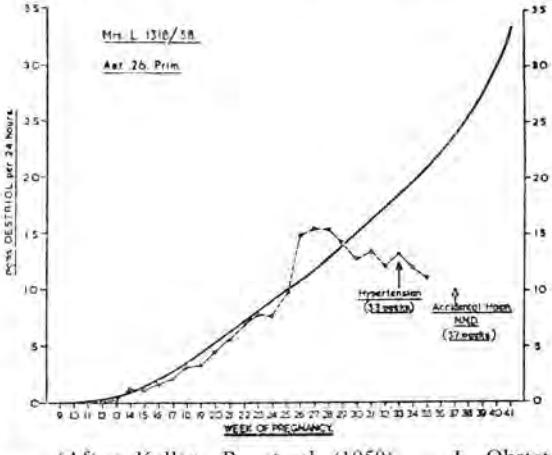


(After Coyle, M. G. and Brown, J. B. (1963) — J. Obstet. & Gynae. Brit. Cwlth., **70**, 225).

Fig. 8

Abnormal Urinary Oestriol Pattern

This figure shows a falling urinary oestriol pattern with Placental Insufficiency State.



(After Kellar, R. et al (1959) — J. Obstet. Gynae. Brit. Emp., **66**, 804).

(ii) Progesterone/Pregnanediol Studies in Blood/Urine:

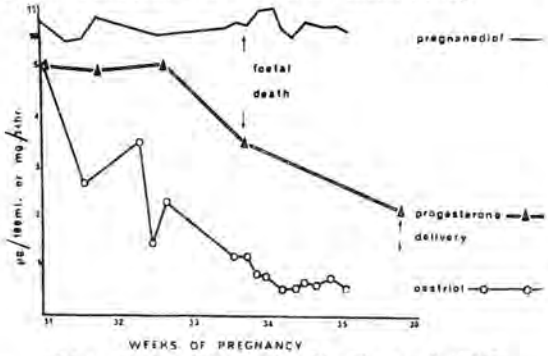
Klopper (1963), Klopper et al (1955), Coyle et al (1956), Greig et al (1962) and Russell et al (1960) have shown that the

serial assays of blood progesterone or urinary pregnanediol during the pregnancy can be a useful measure in ascertaining the state of placental function. Placental insufficiency syndrome is stated to be characterised by a falling blood progesterone, or urinary pregnanediol levels. Hence the information obtained is very similar to urinary oestriol studies, as is shown in Figure 9.

Fig. 9

Abnormal Progesterone/Pregnanediol Levels.

This figure shows a falling blood Progesterone/Urinary Pregnanediol levels in a case of Foetal Death associated with Placental Insufficiency.



(After Greig, M., Coyle, M. G., et al (1962) — J. Obstet. & Gynae. Brit., Cwlth., **69,** 772).

However, Russell (1963) claims that pregnanediol assays are far cheaper than oestriol studies, and also quicker to perform. Whilst the above endocrine assay studies are available in most of the Teaching Hospitals in the United Kingdom, it is much regretted that such facilities are unavailable in Malaysia, at the present.

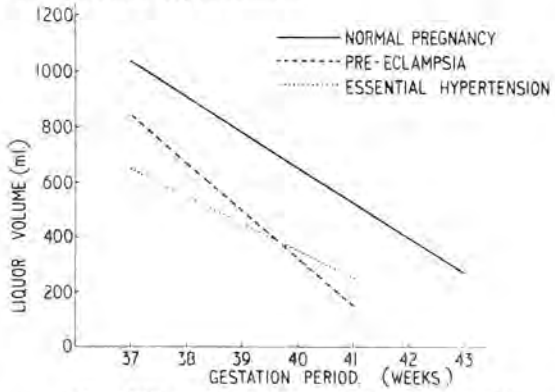
(iii) Liquor Amnii Volume Studies:

Elliott and Inman (1961) have used the volume of liquor amnii as a measure of placental function, in late pregnancy. They studied patients with normal pregnancies, as well as cases of pre-eclampsia and chronic hypertension. A dye dilution technique was used to measure the volume of liquor amnii. In the normal pregnancies it was found that the volume of liquor reached a peak at 38 weeks, when a mean volume of 1,100ml. was obtained. Thereafter, the volume fell progressively to a level of below 300ml. at 43 weeks. In pre-eclamptic and hypertensive patients the liquor volume was not only less than normal but fell progressively from levels around 700ml. at 37 weeks. These findings are well displayed in the above figure (Figure 10). The authors concluded from their study that the clinical findings of maternal loss of weight, and diminution of the girth in late pregnancy in those cases of placental insufficiency syndrome, were consistent with the above findings of low liquor amnii volumes. They state that volumes under 300ml. suggest that the foetus is in grave danger from placental insufficiency state.

Fig. 10

Alterations in Liquor Amnii Volume.

Patterns of Liquor Amnii Volume at various gestation period in normal pregnancy, Pre-Eclampsia, and Essential Hypertension.



(After Elliott, P. and Inman, W. H. W. (1961) — Lancet Vol. **2,** 835).

(iv) Vaginal Cytological Studies:

Wood et al (1961) have stated that, with the aid of vaginal endocrine cytology, they were able to prognosticate impaired placental function in patients with pre-eclamptic toxaemia or chronic hypertension. Their assessment of the vaginal smear was made from the following 4 features:—

(1) the amount of cell desquamation;
(2) the size of the cells;
(3) the pattern of the cells, and
(4) the cornification index.

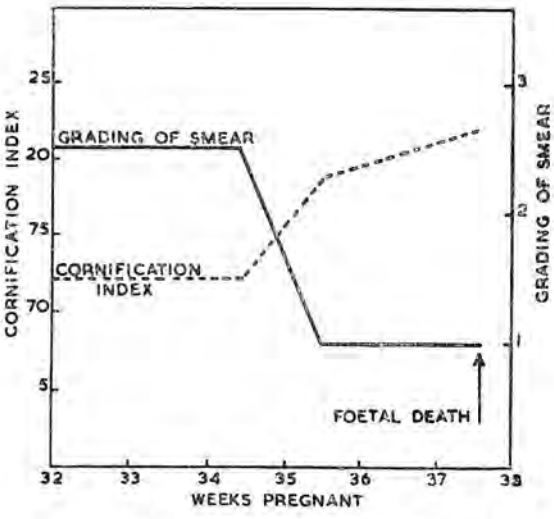
Good placental function is characterised by —

(1) intensive cell desquamation;
(2) large cells;
(3) equal proportion of basal and navicular types of cells, and
(4) cornification index of less than 10.

Fig. 11

Vaginal Cytology in Placental Dysfunction.

This figure shows an abnormal pattern of vaginal cytology in a case of Placental Dysfunction associated with Chronic Hypertension.



(After Wood, C., Osmond Clarke E. and Murray, M. (1961) — J. Obstet. & Gynae. Brit. Cwlth., **68**, 778).

Poor placental function, on the other hand, is characterised by —

(1) poor and scanty cell desquamation;

(2) small cells;

(3) poor crop of basal and navicular cells, and

(4) high cornification index.

These latter features are displayed in the above figure which is representative of placental insufficiency syndrome in a case of chronic hypertension.

(v) Iso-Citric Dehdrogenase Enzyme Levels in Blood:

Dawkins, MacGregor and MacLean (1959) suggested that the estimation of the placental enzyme — iso-citric dehydrogenase — in the maternal serum could be used as an index of placental function. Morris and Jeacock (1962) also found that there were abnormal patterns of the enzyme levels in toxaemia of pregnancy and accidental haemorrhage. However, this test is still in an experimental state.

Summing up this section on the diagnostic aspects of the placental insufficiency syndrome, it is apparent that there is no single test for the detection of placental insufficiency. The diagnosis is essentially an inference, after a careful assessment of the overall clinical picture; and in some cases, ancilliary investigations, such as oestriol/pregnanediol levels in the urine or blood, may be helpful to reach a decision.

Summary:

1. A concept of the "Placental Insufficiency Syndrome" has been put forth.

2. The pathology of placental failure has been tabulated.

3. The aetiology of the placental insufficiency syndrome has been discussed, as viewed from the obstetrician's angle.

4. Aids to the diagnosis of this syndrome, both clinical and ancilliary, have been reviewed.

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I wish to make official acknowledgements to the Editors of the undermentioned Journals and authors of their respective publicaions for the use of the following Figures from their publications in this paper:—

(i) Figure 1 — Lancet, (1953), Vol. II — Walker, J. & Turnbull, E.P.N.

(ii) Figure 2 — Amer.J.Obstet.Gynae., (1963), Vol. 85 — Browne, J.C.M.

(iii) Figure 3 — Amer.J.Obstet.Gynae., (1963), Vol. 85 — Browne, J.C.M.

(iv) Figure 4 — Amer.J.Obstet.Gynae., (1963), Vol. 85 — Browne, J.C.M.

(v) Figure 5 — Brit.Med.J. (1957), Vol. II — Turnbull, E.P.N. and Baird, D.

(vi) Figure 6 — Brit.Med.J. (1957), Vol. II — Turnbull, E.P.N. and Baird, D.

(vii) Figure 7 — J.Obstet.Gynaec.Brit. Commonw., (1963), Vol. 70 — Coyle, M.G. & Brown, J.B.

(viii) Figure 8 — J.Obstet.Gynaec.Brit.Emp., (1959), Vol. 66. — Kellar, R. et al.

(ix) Figure 9 — J.Obstet.Gynaec.Brit. Commow., (1962), Vol. 69 — Greig, M., Coyle, M.G. et al.

(x) Figure 10 — Lancet (1961), Vol. II — Elliott, P. and Inman, W.H.W.

(xi) Figure 11 — J.Obstet.Gynaec.Brit. Commonw., (1961) — Wood, C., Osmond-Clarke, E. and Murray, M.

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GALLOWAY MEMORIAL LECTURE — 1964 *

AMNIOTOMY IN THE TREATMENT OF PLACENTAL INSUFFICIENCY SYNDROME

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PART II — Management of the Placental Insufficiency Syndrome and the Results of Study.

INTRODUCTION:

The crux of the problem in the management of the placental insufficiency syndrome is to be able to secure the safe delivery of a viable sized foetus, which could possess a reasonable chance of survival outside the maternal environment. Due to a state of placental dysfunction, this maternal environment has become inadequate to meet the oxygen and nutrient demands of the growing foetus.

Regime of Management:

TABLE I

Management of Placental Insufficiency Syndrome

1. Bed Rest.
2. Sedation.
3. Specific Therapy of the Underlying Cause.
4. Induction of Labour.
5. Caesarean Section.

(i) Bed Rest:

When placental insufficiency is suspected and the foetus is still premature, it is advisable to keep the patient at rest in bed, so as to improve the state of utero-decidual blood flow, and thereby to enhance placental circulation and perfusion. The chances of survival of an infant born prematurely depend on the duration of gestation rather than on its birth weight, which in any case will not increase, and may even decrease, if the placenta cannot keep pace with the demands of the foetus. For example, a 5-pound mature infant, born to a mother with moderate pre-eclampsia at the 38th week of gestation, has a better chance of survival than a similar sized infant born to a mother with mild pre-eclampsia but more prematurely at the 34th week of gestation.

Decision as to the best time to effect delivery demands a balanced obstetric judgment, weighing the risks of prematurity on the one hand, and the risks of placental insufficiency on the other hand. Taking all these into account, the time comes when delivery seems imperative if a live child is to be secured, but till then, bed rest can be of great help to improve the state of placental circulation.

(ii) Sedation:

Anxious and restless patients will benefit from barbiturates or tranquilisers to alleviate their symptoms, and thereby render bed rest therapy more effective. Sodium Amytal or Luminal are the popular barbiturates prescribed. Sparine (promethazine hydrochloride) is probably the most popular tranquiliser in obstetric practice, at present. Patients with severe abdominal cramps or backache, and who need to be in bed rest, will benefit from some form of analgesic.

(iii) Specific Therapy of the Underlying Cause:

It is stated that, as a rule, it is best to avoid the use of diuretics to treat the oedema in toxaemia of pregnancy, because their use

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may result in loss of body weight in the patient. This weight loss may mimic weight changes due to placental deterioration, and so lead the obstetrician to effect delivery before it is really necessary, (Browne, 1962). In most instances, the oedema co-existing with pre-eclampsia or chronic hypertension, will be found to resolve itself by rest in bed.

The use of hypotensive agents in the treatment of placental insufficiency syndrome is again debatable. Whereas hypotensive drugs have a place in the therapy of patients with moderate or severe chronic hypertensive vascular disease, their use in the treatment of pre-eclamptic toxaemia, or even mild essential hypertension is not universally accepted, and is stated to be unnecessary by most authorities.

Effective prevention and treatment of anaemia in the pregnant patient does go a long way to decrease the deleterious effects of placental insufficiency state on the foetus, whatever may be the predisposing cause of placental failure.

In those patients with chronic pyelonephritis, proper vigilance to prevent reinfection of the renal tract, and effective therapy of the renal infection, when it does occur, can go a long way to decrease the adverse effects on the state of placental function.

Similarly, in those patients with diabetes mellitus, the effective and constant vigilance, and control of the maternal diabetic status can in turn contribute to considerable improvement in the state of placental function, and hence to a higher foetal salvage rate. Good team-work is very essential in the care of the pregnant diabetic patient, who should be under the joint responsibility of both physician and obstetrician throughout her pregnancy. In addition, the paediatrician and in some cases the anaesthetist, should be brought into the picture for the care of the patient during the labour and delivery. Decision as to when to effect delivery needs balanced judgment, if perinatal death from either foetal immaturity or placental insufficiency is to be avoided.

(iv) Induction of Labour:

In those cases of placental insufficiency syndrome where the foetus is of viable size and maturity, termination of pregnancy by the induction of labour will be indicated. In most hospitals, and in most instances, the method of choice is *Surgical Induction of Labour* by amniotomy. In very few cases, where the state of the cervix renders surgical induction to be technically difficult, then an intravenous oxytocin drip may be administered to produce effacement and dilatation of cervical canal and theraby allow for subsequent surgical induction by amniotomy.

Surgical Induction of Labour is performed by the artificial rupture of the amniotic membranes. In most instances, the bag of forewaters are punctured with a Kocker's artery forceps, or a special amniotomy forceps. In a very few instances with a high and unengaged presenting part, the hind-waters of the amniotic sac may have to be punctured with a Drew-Smythe catheter, to prevent the prolapse of the umbilical cord.

Browne (1962) states that a careful note should be made of the volume, consistency and appearance of the liquor amnii at the time of induction. If the liquor is plentiful, escapes freely, and is colourless, then placental insufficiency is unlikely, and delivery can be awaited calmly. On the other hand, if the liquor is scanty, thick and stained with meconium, then there is impending risk to the foetus owing to placental insufficiency, and a special watch should be maintained on the foetal heart until the child is safely delivered. It should be remembered that contractions of labour themselves impair placental function, and may be the last straw for a foetus already embarrased by placental insufficiency from some other cause, such as toxaemia of pregnancy or post-maturity.

Although the concept of placental insufficiency syndrome and its concomitant hazards have been brought to the attention of the medical profession only in the last decade, pioneer research work on this important facet of obstetric practice had been undertaken by Professor Sir Dugald Baird and his co-workers in Aberdeen, more than 15 years ago, viz, as early as 1949 by Walker and Turnbull. Baird (1960) sugests that there is much to be said for induction of labour to avoid the risks of placental insufficiency syndrome, and for a

more liberal use of Caesarean Section to avoid the undue stress to the baby in labour. In 1953, following the findings of Walker and Turnbull (1953), Professor Sir Dugald Baird implemented the policy at the Aberdeen Maternity Hospital, whereby routine surgical induction of labour was performed on those patients, suspected of having placental insufficiency syndrome. The results of his Study were presented in his Ingleby Memorial Oration, entitled "The Evolution of Modern Obstetrics", (Baird, 1960). He showed that there was an obvious fall in perinatal mortality from toxaemia of pregnancy and postmaturity in the Aberdeen primigravid women of all age groups, during the second 5-year period of 1953 to 1957, as compared to the first 5-year period of 1948-52, and that the fall was most marked in primigravid women aged 30 years or more.

In his oration, Baird (1960) concluded that in order to achieve maximal foetal salvage from placental insufficiency, it was necessary to perform numerous routine inductions of labour, on the basis of epidemiological inferences, and to use Caesarean Section freely in the interests of the baby. He further states that the policy of surgical induction of labour is justified in the absence of any more selective method of prevention of the placental insufficiency state, and by the very results in foetal salvage that have been attained.

Unfortunately surgical induction of labour by amniotomy is not without its attendant risks of intra-amniotic infection with danger to both foetus and mother. Infection is especially liable to occur when labour does not quickly follow the induction. Occasionally a Caesarean Section has to be done because labour fails to start despite every effort.

Surgical induction of labour, therefore has its pros and cons, and it is the responsibility of every obstetrician to select carefully those cases that are to be subjected to this therapy. I have attempted to summarise the salient advantages and distadvantages of surgical induction of labour in the following table. (Table II):

TABLE II

Advantages/Disadvantages of Surgical Induction of Labour.

ADVANTAGES:
1. High Success Rate.
2. Short Induction-Delivery Interval.
3. Allows for Early Detection of Foetal Distress.
4. Physiologically Sound.
DISADVANTAGES:
1. Failure to go into Labour.
2. Intra-Amniotic Infection.
3. Prolapse of the Umbilical Cord.

(v) Caesarean Section:

Caesarean Section, as a therapeutic procedure, in the management of the placental insufficiency syndrome, may be indicated as an elective procedure or as an emergency measure. Elective Caesarean Section may be indicated in those cases, where labour pains can be a risk to the foetus in utero. Such is the case in the elderly primigravida with a bad past obstetric history of prolonged involuntary infertility or habitual abortions. The primigravid pregnant diabetic patient is also best treated by elective Caesarean Section.

Emergency Caesarean Section, in the management of the placental insufficiency syndrome, is indicated either for foetal distress during the first stage of labour, or where labour pains fail to ensue following surgical induction and where the use of the pitocin drip is contraindicated, such is the case in the multigravid diabetic patient. An emergency Caesarean Section may also be indicated, following upon amniotomy, when severe intra-amniotic infection sets in, thus making delay in awaiting vaginal delivery, hazardous to both infant and mother. It is also indicated when the patient stubbornly fails to go into labour, despite surgical induction and intensive intravenous oxytocin medication. The last two groups of cases should be few indeed, if due care is paid to the strict selection of cases, that are to be subjected to this regime of therapy.

Similar views have been expressed by Professor Sir Dugald Baird (1960) who states that occasionally a Caesarean Section has to

be done because labour fails to start despite every effort to effect delivery, following upon surgical induction of labour by amniotomy. In this context, he further concluded that the increased use of surgical induction and Caesarean Section in the treatment of placental insufficiency syndrome has undoubtedly saved many infants, and fulfils the criteria of sound obstetrical practice. Hence this regime of management has come to stay, unless it can be shown that there is an increased risk to the mother from this therapy, or if a more effective alternative way in the treatment of placental insufficiency syndrome is forth-coming.

Regime of Study:

Over the past 15 months, from May 1963 to July 1964, following upon my return from the United Kingdom, I had conducted a personal study project to evaluate the efficacy of *Selective Amniotomy* in the treatment of the placental insufficiency syndrome, in both Government Units of Kandang Kerbau Hospital. This study project had the approval of the Hospital Postgraduate Committee, and in particular the blessings of the Clinical Heads of both the Government Units, Mr. T. H. Lean of the 'A' Unit and Dr. S. M. Goon of the 'B' Unit. I wish to express my sincere gratitude to both of them, and to the numerous doctors and members of the nursing staff in both the Government Units, for having rendered invaluable assistance, without which this project could not have been successfully undertaken.

The essence of success in this study is dependent entirely upon the SELECTIVENESS of those cases that are to be subjected to the surgical induction of labour, by amniotomy. In the absence of facilities in Singapore, to perform the elaborate ancillary laboratory investigations to detect placental insufficiency syndrome, my criteria of *Selection* is based upon the following two features: -

(a) **Clinical Picture of the Case.**

By this I mean, that the clinical history reveals the presence of any one of the causes of placental insufficiency syndrome, either major or minor, as detailed in Table II and III, earlier on (in Part I of this Lecture). The co-existence of other stigmata of placental insufficiency syndrome, such as abnormal weight patterns, blood pressure readings and urinary albumin, may serve as additional parameters which may point to the necessity of induction.

(b) **The State of the Cervix.**

This is my second criteria for selective induction. With very few exceptions, a genuine state of placental insufficiency syndrome is associated with favourable state of the cervix, also referred to as the "ripeness" of the cervix, which in turn renders surgical induction of labour to be technically easy. In my view, a "ripe" cervix is that state of the cervix which fulfils one or more of the following criteria viz.: -

(i) Soft velvety state of the cervix — contrast to the firm fibrous cervix, when unripe.

(ii) A partially dilated cervical canal, accommodating easily 1 finger in primigravida, and 1½ to 2 fingers in a multigravida

(iii) An easily distensible and elastic state of the cervical canal to digital palpation.

I have been of the firm opinion that there is a direct correlation between placental dysfunction and the "ripening" of the cervix, a view which has been fully substantiated by my observations in the present investigations. I have observed that in those cases, where there is a premature degeneration of the placenta before term, such as would occur in moderate and severe pre-eclamptic toxaemia, there is invariably an associated premature "ripening" of the cervix, as described above. In other words, it is not unusual to find the state of the cervix in a patient with moderate pre-eclampsia at the 37th week of gestation to be very similar to the cervix of a genuinely post-mature patient, and this state of "ripeness" of the cervix in these two instances will be a sharp contrast to the "unripe" cervix in a patient with an uneventful normal pregnancy just before term.

It is apparent in my mind, that there seems to be a direct inter-relationship between degeneration of the placenta, and the readiness of the uterus to go into labour. What the

nature of the inter-relationship is, and how this is mediated, be it humoral or enzymatic, is still a puzzle to the research obstetrician. The solution to this problem awaits the enquiring and adventurous research worker.

Based upon the above criteria of case-selection, the patients for this study project are picked up from the ante-natal clinics and the ante-natal wards of both the Government Units of Kandang Kerbau Hospital. All cases in this study project have their final screening by myself, as to their suitability for surgical induction of labour. All selected patients are admitted to the labour wards of the Kandang Kerbau Hospital.

After a routine soap and water enema, a vaginal examination is carried out by me, and if the state of the cervix is favourable, then induction of labour is performed by artificial rupture of the amniotic membranes (fore-waters). At the time of induction, an observation is made of the quality and quantity of liquor amnii. The foetal heart is also auscultated before and after the induction procedure. All patients, after amniotomy, are put on an hourly foetal heart/maternal pulse, and an 8-hourly temperature chart. In addition, they are placed on a 4-hourly blood pressure chart in those cases of pre-eclamptic toxaemia. A vulval pad is applied and the patient is allowed to rest in bed.

Every case so treated is personally followed up, and a great majority of these cases will have become established in labour within 18 to 24 hours of the induction. Once labour has been established, the subsequent management would be no different from cases with spontaneous onset of labour.

Of those cases that failed to become established in labour within 18 to 24 hours of amniotomy, an intravenous oxytocin drip was administered to stimulate the onset of labour. If an oxytocin drip was commenced, it was usually continued until the child had been delivered, and labour completed. In very few instances, where the delivery was not effected with an intravenous oxytocin drip on the first day after amniotomy, the drip had to be administered on the subsequent day again. The oxytocin drip was commenced usually with 2 units of oxytocin per pint of 5% dextrose at 20 drops per minute. The rate and concentration of the oxytocin drip were gradually increased until uterine contractions simulating normal labour pains ensued; thereafter no further increase of the drip rate was made, and the drip was maintained until delivery had been effected. Hence the final concentration of oxytocin that has to be administered would vary with the individual uterine sensitivity to the oxytocin. In a certain percentage of cases, oxytocin drip had to be given to hasten and complete the labour that had ensued after amniotomy per se.

Caesarean Sections were resorted to in those cases, where there were the usual maternal or foetal indications in the first stage of labour; and also in those cases which had failed to become established in labour after the above regime of induction.

RESULTS OF STUDY:

TABLE III

Pattern of Study Project:

CASE – PATTERN	NO. OF CASES	%
Cases considered for amniotomy based upon the Clinical History/Ante-Natal Record	1022	100%
Cases rejected on unfavourable state of cervix	22	2.2%
Cases subjected to amniotomy regime	1000	97.8%
No. of mothers in Study Project	1000	—
No. of infants in Study Project ... ... (Includes 10 twin pregnancies)	1010	—
Gross maternal mortality	0	—
Gross perinatal mortality	13	12.9/1,000 Births

TABLE IV

Indications for Induction (1,000 cases)

MAJOR INDICATIONS			MINOR INDICATIONS		
Postmaturity Syndrome	=	61.6%	Unexplained Past Perinatal Death	=	0%
Postmaturity Syndrome + PET	=	4.6%	Habitual Abortions	=	0.1%
Pre-Eclampsia/Eclampsia	=	30.3%	Involuntary Infertility	=	0.2%
Chronic Hypertension	=	0%	APH/Threatened Abortions	=	1%
Diabetes Mellitus	=	0.6%	Previous L.S.C.S.	=	0.5%
Elderly Primigravida	=	0.6%	Twins	=	0.2%
Chronic Pyelonephritis	=	0.3%			
TOTAL	=	98%	TOTAL	=	2%

Table III shows the pattern of this study project. In all, 1022 cases were considered for surgical induction of labour, on the basis of the clininical history and the ante-natal record. However, 22 cases of postmaturity were rejected, because of the unfavourable state of the cervix. In most of these 22 cases, the postmaturity status was not confirmed, on radiological assessment. In some of them, vaginal reassessment, one to two weeks later, revealed a favourable cervix, and amniotomy was duly performed. In none of these 22 cases, were the babies lost from deferment of the induction.

In this Study, 1000 out of the 1022 cases (97.8%) were subjected to amniotomy, and the results that will be reviewed, represent the study of these 1000 consecutive cases. There were no maternal deaths, and the gross perinatal mortality was 12.9 per 1,000 births.

The indications for the induction of labour in the 1,000 cases have been summarised in Table IV. It is apparent that 98% of the inductions have been undertaken for major causes of placental insufficiency, as outlined in Part I of this Study. The postmaturity syndrome has been the indication for induction in two-thirds (66.2%) of the cases. In one-third (34.9%), toxaemia of pregnancy is the indication. The co-existence of pre-eclamptic toxaemia with postmaturity is usually lethal to the foetus, and this combination was the indication in 4.6% of the cases.

Table V shows that one-third of cases (31.8%) studied were primigravida, and a further quarter (27.2%) of them were grand multiparae.

TABLE V

Parity Distribution (1,000 cases)

PARITY PATTERN	%
Para 0	31.8%
Para 1	13.0%
Para 2	11.4%
Para 3	8.8%
Para 4	7.8%
Para 5 and over	27.2%

TABLE VI

Induction — Delivery Interval

Induction — Delivery Interval (I.D.I.)	%
Under 6 hours	23.8%
Between 6 to 12 hours	30.3%
Between 12 to 24 hours	29.3%
Between 24 to 36 hours	12.2%
Between 36 to 48 hours	2.4%
Bewteen 48 to 60 hours	2.0%

The Induction — Delivery Interval, or the I.D.I., is the interval of time between the artificial rupture of the amniotic membranes and the attainment of delivery. This interval phase will include the time-lag between amniotomy and the onset of labour pains, and also the total duration of the first and second stages of labour.

The above table (Table VI) indicates that more than half (54.1%) of all the cases induced, were delivered within 12 hours of the surgical induction of labour, and in none of these cases, was intravenous oxytocin therapy utilised. Just under one-third (23.3%) of all cases were delivered between 12 to 24 hours of amniotomy, and most of these cases also required no oxytocin therapy. In the remaining 16.6% of cases, the induction — delivery interval was prolonged beyond 24 hours. In almost all these cases, with the exception of those few cases with prolonged hypertonic dysfunctional labour, intravenous oxytocin had to be utilised either to induce the onset of labour pains, or to hasten the labour, that had commenced after amniotomy. In all, 19.1% of cases in this Study, required intravenous oxytocin therapy at some stage of their induction — delivery phase, (Table VII).

Table VII shows that 4 out of the 1,000 cases (0.4%) required oxytocin therapy to effect dilatation of the cervical canal before amniotomy could be performed. In 2 of these 4 cases, moderate pre-eclamptic toxaemia, before the 38th week of gestation was the indication, and in the other 2 instances, the post-maturity syndrome, confirmed by clinical and radiological assessment of the foetal maturity, was the indication. In all 4 cases, amniotomy was performed between 4-8 hours after the commencement of the oxytocin drip, when vaginal reassessment revealed the cervical canal to be dilated sufficiently, for amniotomy to be feasible.

Another 9.8% of the cases required intravenous oxytocin therapy to induce the onset of labour pains after amniotomy. Hence, in this Study, only 10.2% of the 1,000 cases required intravenous oxytocin to induce the onset of labour pains; the remaining 89.8% became established in labour following amniotomy. This observation, which had also been made by other authorities, reaffirms the author's belief that there is a close inter-relationship between placental degeneration and the onset of labour following amniotomy in placental insufficiency. It is probable that placental degeneration provides the chemical stimulus, be it hormonal or enzymatic, which primes the uterus for its readiness to go into labour; and under these circumstances, amniotomy will result in a state of uterine decompression, which may be the final mechanical trigger for labour to commence. This is put forward as a possible hypothesis.

In this Study, a further 8.9% of cases required intravenous oxytocin therapy to hasten and complete the sluggish labour, that had ensued after amniotomy. Thus, in all, 19.1% of the 1,000 cases had required oxytocin therapy to effect delivery. Caesarean Section was performed for "*Failed Amniotomy/Oxytocin Induction*" in 0.8% of the 1,000 cases.

TABLE VII

Pattern of Intravenous Oxytocin Therapy

PATTERN OF CASES STUDIED	NO. OF CASES	%
Incidence of i/v oxytocin drip used to dilate cervix (before ARM)	4	0.4%
Incidence of i/v oxytocin drip to induce labour (after ARM)	98	9.8%
Total incidence of cases requiring oxytocin to induce labour	102	10.2%
Incidence of i/v oxytocin drip used to hasten and complete labour	89	8.9%
Gross incidence of i/v oxytocin drip used to effect delivery	191	19.1%
Incidence of L.S.C.S. done for failed amniotomy/Oxytocin induction	8	0.8%

In placental insufficiency syndrome, the routine use of intravenous oxytocin therapy, along with amniotomy, is unnecessary. That this is so, shown by the fact that 80.9% of all cases subjected to amniotomy alone attained delivery, without oxytocin therapy; and that in 8.9% of cases oxytocin therapy was only required to complete the labour that had commenced after amniotomy. Similar views have been expressed by Baird (1960) and others, who advocate amniotomy in the treatment placental insufficiency syndrome.

In fact, the routine use of intravenous oxytocin therapy, can be lethal to the foetus, in some instances. Firstly, the use of oxytocin therapy, without amniotomy, may not allow for the early detection of foetal distress—namely meconium stained liquor amnii. Secondly, the oxytocin therapy if administered to those cases, whose uterine contractions are destined to be of normal quality, duration and frequency, is likely to result in a state of abnormal hypertonic uterine activity. This may be the last straw to be foetus in utero, already embarrassed by placental dysfunction.

The diagnostic criteria of infection in this Study was taken as a single or multiple rise of temperature above 100.4°F, after the induction and until the patient's discharge from hospital, which varied between 2 to 14 days post-partum. Based upon this criteria, the gross infection rate 3.9%.

An analysis of these 39 cases revealed that in 1.4% (14) of cases, the procedure of amniotomy was not directly responsible. However, in 25 cases there was clinical evidence of intra-amniotic infection, giving an infection rate of 2.5%. In all these patients, the infection responded to the usual routine antibiotic therapy of penicillin and streptomycin. None of the infants, in this Study, were lost from intra-amniotic infection.

TABLE VIII

Infection Pattern following Induction

Gross Infection Rate (39 cases)	3.9%
Aetiology of Infection (T° = 100.4°F or above):	
Intra-amniotic Infection (25 cases)	2.5%
Urinary Infection (10 cases)	1.0%
Uterine Sepsis, following MRP (2 cases)	0.2%
Abdominal Wound Sepsis (1 case)	0.1%
Perineal Wound Sepsis (1 case)	0.1%

TABLE IX

Prematurity Pattern in Study

PATTERN OF PREMATURITY IN STUDY:	No. of INFANTS	%
TOTAL NO. OF INFANTS IN STUDY	1010	100%
Infants with birth-weight below 5½ pounds	82	8.1%
Infants with birth-weight below 5 pounds	29	2.9%
Distribution of the 29 infants under 5 pounds birth-weight:-		
Postmaturity Syndrome	8	0.8%
PET/Eclampsia Syndrome	15	1.5%
Diabetes Mellitus with PET	1	0.1%
Twin Pregnancy	1	0.1%
Ante-Partum Haemorrhage	4	0.4%

It must be emphasized that intra-amniotic infection following induction is one of the hazards of the procedure. Every obstetrician who practises induction of labour by amniotomy, is conscious of this danger to the mother and neonate. Such risks can be reduced to the minimum, if the principle of surgical asepsis is strictly observed during amniotomy, and if the induction delivery interval is kept short.

In 1935, the International Medical Committee of the League of Nations had advocated the acceptance of the definition of a premature infant as one that had a birth-weight of $5\frac{1}{2}$ pounds (2,500 gms.) or less, regardless of the period of gestation. On this basis, the prematurity rate in this Study was 8.1% (82 infants). However, the newborn infants in Malaysia are, on the average, smaller by about $\frac{1}{2}$ pound, in comparison to their Western counterparts. Hence, it is conventional to regard the 5-pound birth-weight, as the upper limit of prematurity in this country, (Wong, 1964). On this basis, the incidence of prematurity was 2.9%.

An analysis of these 29 infants reveals that in 21, the indications for induction were toxaemia of pregnancy (15), diabetes mellitus with PET (1), twins (4), and ante-partum haemorrhage (1); and in all these four groups, a higher prematurity rate is to be expected. In 8 of these 29 cases, the postmaturity syndrome had been the indication. Whilst, the author is prepared to accept the possibility that in some of these cases, the dates may have been misleading, and genuine postmaturity non-existent, this statement cannot be applied en bloc to all the 8 cases. For, it is an accepted fact that postmature infants may fall into the prematurity group, due to their low birth-weight, and that such infants do run a higher risk of perinatal deaths.

Table X reveals that 96.6% of the 1,000 consecutive cases, subjected to induction of labour, came to vaginal delivery; in 89.3% of cases, spontaneous delivery occurred, and in 7.3% of cases, assisted vaginal delivery was undertaken for the usual maternal or foetal indications.

Caesarean Section was performed in 3.4% of cases, but of these only 8 (0.8%) cases required Caesarean Section for "failed induction of labour". In one case (0.1%), destructive vaginal delivery had to be undertaken.

Table XI shows that, in this Study, the gross Caesarean Section rate was 3.4%. In all these 34 cases amniotomy was performed for clear-cut major indications of placental insufficiency syndrome. (15 cases of postmaturity, 17 cases of pre-eclamptic toxaemia, and 2 cases of postmaturity with toxaemia).

The indications for the 34 Caesarean Sections have been tabulated, and it reveals that in over one-third (13 cases) of these cases, foetal distress was the indication. In fact, in all these 13 cases, amniotomy allowed for the early detection of foetal distress, and it is probable that most of these infants would have succumbed to intra-uterine asphyxia from placental insufficiency, if not for their early detection following amniotomy. In fact, the last section of Table XI reveals that in 2 instances, the infants (Cases 1 and 3) still succumbed to intra-uterine asphyxia, despite attempts to salvage them by Caesarean Section. In both these instances, the avoidable factor was the delay in the induction of labour. In Case 1, the induction ideally should have been performed soon after the 42nd week of gesta-

TABLE X

Delivery Pattern

Mode of Delivery (1,000 cases):	%
Spontaneous Vaginal Delivery	89.3%
Assisted Vaginal Delivery (Forceps/Ventouse)	7.3%
Caesarean Section Delivery	3.4%
Caesarean Section for Failed Induction	0.8%
Foetal Craniotomy and Extraction	0.1%

tion, and in Case 3, just before or at term, rather than allow the patient to proceed into the 42nd week of gestation with toxaemia of pregnancy.

A review of the indications for the Caesarean Sections reveals that in 26 out of the 34 cases, Caesarean Section delivery would have been indicated, irrespective of whether amniotomy had been undertaken. In the remaining 8 cases, Caesarean Section had to be done because labour failed to ensue following amniotomy, and subsequent oxytocin therapy. This, *Failed Induction — Caesarean Section Rate of 0.8%* is indeed a very low price to pay for the salvage of several hundreds of babies from the hazards of the placental insufficiency syndrome.

Three of the 13 perinatal deaths in this Study, followed delivery by Caesarean Section, as detailed in the last section of Table XI. In two instances, the placental insufficiency syndrome was directly responsible for the deaths. In the third instance (Case 2), the faulty technique, in the delivery of the infant at Caesarean Section, had resulted in the inhalation of liquor amnii during the delivery, with the resultant perinatal death from aspiration pneumonia.

The next table (Table XII) is self-explanatory. The gross perinatal mortality in in this Study was 12.9 deaths per 1,000 births. The placental insufficiency syndrome, with its sequelae of intra-uterine asphyxia, was directly responsible for 10 out of the 13 (76.9%) perinatal deaths and these are the first 10 cases summarised in the Table. In 7 of these 10 deaths, the postmaturity syndrome was responsible for the deaths, whilst in the 8th and 9th cases, the co-existence of pre-eclamptic toxaemia with prolonged pregnancy proved lethal to the foetus. In all these 9 unbooked cases, lack of ante-natal care was the principal

TABLE XI

Caesarean Section Pattern

Total No. of cases in Amniotomy Study		= 1,000 cases
Total No. of Caesarean Sections performed		= 34
Caesarean Section Rate		= 3.4%
Indications for Induction in the 34 cases:		3.4%
Postmaturity Syndrome	15 cases	1.5%
Postmaturity Syndrome + PET	2 cases	0.2%
Pre-Eclamptic Toxaemia	17 cases	1.7%
Indications for Caesarean Section in the 34 cases:		3.4%
Foetal Distress	13 cases	1.3%
Cephalo-Pelvic Disproportion	5 cases	0.5%
Major Hypertonic Uterine Dysfunction	6 cases	0.6%
Fulminating Toxaemia of Pregnancy	1 case	0.1%
Elderly Primigravida (37 years) Maternal Distress	1 case	0.1%
Failed Induction of Labour	8 cases	0.8%

Perinatal Deaths following Caesarean Section = 3 Infants:

Aetiology	**L.S.C.S. Indications**	**Cause of Death**
CASE 1 — Postmaturity (44/52)	— Foetal Distress	Asphyxia
CASE 2 — Postmaturity (44/52)	— Major Ut. Dysfunction	Aspiration Pneumonia
CASE 3 — PET at 42/52	— Foetal Distress	Asphyxia

TABLE XII
PERINATAL MORTALITY PATTERN

Total No. of Infants in Study Project = 1010 (10 Twins)
Total No. of Foetal (Perinatal) Deaths = 13
Gross Perinatal Mortality Rate = 12.9/1,000 births

Case No.	Hospital Reg. No.	Induction-Indication	Mode of Delivery	B.Wt.	S.B./N.N.D.	Cause of Death (Autopsy/Clinical)
1	21597/63	Postmaturity (44/52)	Caesarean Section	5- 4	N.N.D. (1 day)	Asphyxia (autopsy)
2	23503/63	Postmaturity (44/52)	Vacuum Extraction/ Forceps Delivery	6- 8	S. B.	Asphyxia (autopsy)
3	40148/63	Postmaturity (44/52)	Spontaneous	4- 8	S. B.	Asphyxia (autopsy)
4	41637/63	Postmaturity (43/52)	Spontaneous	4-12	N.N.D. (1 day)	Asphyxia (clinical)
5	6056/64	Postmaturity (45/52)	Spontaneous	5- 2	N.N.D. (1 day)	Asphyxia (clinical)
6	8643/64	Postmaturity (45/52)	Spontaneous	5-10	N.N.D. (1 day)	Asphyxia (clinical)
7	15580/64	Postmaturity (46/52) (Diabetes)	Spontaneous	9-12	N.N.D. (1 day)	Asphyxia (autopsy)
8	6207/64	PET (42/52)	Spontaneous	5- 8	N.N.D.(2 days)	Asphyxia (autopsy)
9	14552/64	PET (42/52)	Caesarean Section	7- 0	S. B.	Asphyxia (autopsy)
10	2752/64	Diabetes Mellitus (39/52) (+ PET)	Spontaneous	4- 4	N.N.D. (1 day)	Asphyxia (clinical)
11	17742/64	PET (39/52) (Diabetes)	Shoulder Dystocia/ Extraction	11- 4	S. B.	Birth Trauma (clinical)
12	35278/63	Postmaturity (44/52)	Caesarean Section	6-14	N.N.D. (1 day)	Aspiration Pneumonia (autopsy)
13	1347/64	PET (42/52)	Spontaneous	4- 3	N.N.D.(6 days)	Multiple Foetal Abnormalities

Summary of causes of Perinatal Deaths:

Placental Insufficiency Syndrome (10 cases)	76.9% of Perinatal Deaths
Birth Trauma (Shoulder Dystocia) (1 case)	7.7% of Perinatal Deaths
Caesarean Section Technique (1 case)	7.7% of Perinatal Deaths
Multiple Foetal Abnormalities (1 case)	7.7% of Perinatal Deaths
Perinatal Deaths in Caesarean Sections	3 deaths (Table XI)

avoidable factor. Theoretically most of these 9 deaths could have been avoided, if induction had been performed earlier — before the end of the 43rd week of gestation in uncomplicated prolonged pregnancies, and at or before term in those pregnancies complicated by pre-eclamptic toxaemia.

In Case No. 10, the past obstetric history was atrocious — 10 out of her 13 previous pregnancies had terminated in stillbirths from diabetes mellitus and placental insufficiency. In this present pregnancy, she was kept in the ante-natal ward from the 35th week of gestation for control of her diabetic status. Although her diabetes remained well under control, there was clinical evidence of poor foetal growth in utero. She also developed pre-eclampsia, and induction had to be performed at the 39th week of gestation, despite the small foetal size. The foetus, at birth, weighed only 4 pounds 4 ounces; it showed evidence of severe placental dysfunction, and succumbed to asphyxia 22 hours later. The placental insufficiency in this case, was obviously of prolonged duration and of severe degree.

Birth Trauma from severe shoulder dystocia (Case No. 11) contributed to 7.7% of the perinatal deaths (one case). The mother had gross hydramnios, and unfortunately the foetal macrosomia of 11 pounds 4 ounces was not diagnosed, until after birth. In both cases, No. 7 and No. 11, the maternal diabetic status was not diagnosed in the ante-natal period, and only became apparent when the glucose tolerance test was done post-partum, in view of the foetal macrosomia.

As stated earlier, aspiration pneumonia during Caesarean Section was the cause of one perinatal death (Case No. 12), contributing to 7.7% of the perinatal deaths. The last perinatal death (Case No. 13) was due to gross foetal abnormalities of hydrocephalus and spina bifida, which were incompatible with life.

CONCLUSIONS:

The results of this Study have substantiated the efficacy and safety of amniotomy in the treatment of the placental insufficiency syndrome.

Surgical induction of labour (amniotomy) is a great boon in this era of modern obstetrics. Let us use it wisely, discriminately and justly. Let it not fall into disrepute by becoming the first resort of the impetuous obstetrician, the routine of the ignorant obstetrician, or the tool of social convenience of the impatient obstetrician. Surgical induction of labour has come to stay, but let it be an Elective and Selective procedure.

SUMMARY:

1. The various aspects in the management of the placental insufficiency syndrome have been tabulated and discussed.
2. The place of amniotomy in the treatment of the placental insufficiency syndrome has been evaluated in the author's series of 1,000 consecutive cases.
3. The results of this Study reaffirm the efficacy and safety of selective amniotomy as a therapeutic procedure in this condition.
4. The results indicate that there is a direct correlation between placental degeneration and the readiness of the uterus to go into labour.
5. Selective amniotomy has come to be accepted as an invaluable tool to the present-day obstetrician.

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THE STUDENT HEALTH SERVICE, UNIVERSITY OF MALAYA

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This resumé of work done at the Student Health Clinic at the University of Malaya in Kuala Lumpur is to show the problems encountered in running a Health Service for University students.

The service caters for all students, resident and non-resident and for non-academic staff who draw a salary of less than $300/- month. Members of the academic staff make occasional use of it.

During the session 1963 – 1964 there were approximately 1,700 students. This number, when broken up into the numbers in each faculty, consists of:—

Arts	870
Science ...	384
Engineering ...	252
Agriculture ...	96
Medicine ...	40
Education ...	35

According to sex:—

	Men	Women
Arts	552	318
Science	303	81
Engineering ...	252	–
Agriculture ...	91	5
Medicine ...	35	5
Education ...	11	24
	1,244	433

According to the chief racial groups there were in the various faculties:—

	Malay		Chinese		Indian		"Others"	
	Male	Female	Male	Female	Male	Female	Male	Female
Arts	236	69	208	183	95	63	13	3
Science	14	1	238	62	46	19	4	–
Engineering	2	–	220	–	27	–	3	–
Agriculture	11	1	71	4	9	–	–	–
Medicine	8	–	24	4	3	–	–	1
Education	4	6	4	12	2	6	1	–
	275	77	765	265	182	88	21	4
	352		1030		270		25	

"Others" include Eurasians and Europeans.

In 1963/64 there were 4,436 visits to the Clinic. Of these 4,055 were from the students, 248 from the non-academic staff, 133 from the academic staff members and their families.

The student visits according to the Faculties were as follows:—

Arts	1,455	i.e. per student	1.7 visits.
Science	999	— do —	2.6 ,,
Engineering	1,032	— do —	4.0 ,,
Agriculture	457	— do —	4.8 ,,
Medicine	62	— do —	1.5 ,,
Education	50	— do —	1.4 ,,

Of the 4,055 visits:—

Respiratory ailments	accounted for	1,778 visits
Gastro Intestinal	— do —	338 ,,
Skin	— do —	335 ,,
Psychiatric	— do —	228 ,,
Skeletal	— do —	176 ,,
Accidents, mostly minor	— do —	129 ,,
Eye ailments	— do —	81 ,,
Ear	— do —	50 ,,
Nervous system	— do —	10 ,,
Genito urinary	— do —	20 ,,

The remaining visits were for the various immunisations against tetanus, polio, or nothing abnormal was found. A brief note on each group follows:—

Respiratory Infections

Of the 1,778 ailments relating to the respiratory tract, 1,681 were for upper respiratory tract infections characterised by at least two of the following — could sore throat, fever and cough. Throat swabs were usually negative for ordinary bacteria and the clinical picture was that of a virus infection. If the patient exhibited high fever, muscular pains and sore throat, swabs were taken, innoculated into broth, packed in ice and despatched with 10 cc of serum to the Virus Research Officer at the I.M.R. for examination to detect influenza virus. From one of these specimens a variant of Influenza A. virus was isolated which is being studied at the Walter Reed Institute in the U.S.A.

The Student Health Centre thus serves to alert the Health Authorities to any outbreak of influenza by newer strains of the influenza virus.

Upper respiratory tract infections with a similar clinical picture can be caused by many viruses. Cross immunity to these do not exist and if a few different strains are introduced into the campus at the beginning of the term, the infections due to these can spread and persist throughout the University community. Hence the large number of upper respiratory infections in the student population. Twelve episodes of Bronchial asthma and two cases of pneumonia were also treated.

T. B.

The Xrays of eight students who applied for admission showed shadows due to healed or early tuberculosis. Their sputums were all negative and they were admitted. They registered with the Chest Clinic, K.L. and were supervised by the Chest Clinic Authorities regarding treatment and re Xraying.

The Mass Xray Unit visited the Campus during the First Term. One thousand students submitted themselves for Xray, no positive cases were detected among them. Of the students who did not Xray themselves, two were later found to have developed T.B. and had to have treatment.

Gastro Intestinal System

Duodenal Ulcers	7
Dyspepsias characterised by transient epigastric pain and nausea	78
Abdominal Colics	55
Irritable Colon	24
Food poisoning, staphylococcal	28
Haemorrhoids	44
Infestations consisting of	39
a) Ascaris	12
b) Ankylostoma duodenale ...	7
c) Trichuris Trichiura	17
d) Strongyloides stercoralis ...	2
Aphthous ulcers	16
Fissure-in-ano	1
Acute appendicitis	2
Infective Hepatitis	2

The methods of treatment adopted might be of interest:—

Peptic ulcer: Pain responded in most cases to antacids, tranquillisers, anti cholinergics and stilboestrol in small doses. Two cases required admission, one for severe pain and one for melaena. Dyspepsias responded to a combination of antacids, anticholinergics and tranquillisers.

Colics: Anticholinergics and tranquillisers.

Staphyloccocal Food Poisoning: Anticholinergics and codeine phosphate.

Haemorrhoids: If there was no response to liquid paraffin and suppositories — they were injected with phenol in almond oil.

Aphthous ulcers: Prednisolone tablets 5 mgm were allowed to dissolve in contact with the ulcers.

Ascaris & Hokworm: Bephenium.

Trichuris, strongyloidiasis: Dithiazanine.

Skin Ailments

Infections like pustules, abscesses, carbuncles	116
Dermatitis, allergic and contact ...	111
Seborrhoea capitis	33
Seborrhoeic dermatitis of face ...	2
Tinea pedis and cruris	57
Urticaria	51
Tinea versicolor	13

Other conditions treated included herpes simplex, ichthyosis, leucoderma, phthirus pubis infestation, hyperhidrosis of palms and soles, acne, warts (planter and palmar), lichen simplex. Many students worried about excessive falling hair and their prospects of going bald. One case of Hydradenitis suppurativa defied all forms of treatment including Xray.

The following methods of treatment were employed:—

Urticaria: Attempts to find the offending food or inhalant usually failed. Antihistamines were used, but if excessive drowsiness was complained of, small doses of steroids, i.e., prednisolone 15–20 mgm daily for 1–2 days rapidly relieved the urticaria without interfering with the students' attendance at lectures.

Dermatitis: Calamine lotion, topical steroid ointment, e.g., fluocinolone acetonide.

Tinea pedis & Cruris: Castellani's paint, tineafex ointment, powder. Griseovin F.P. tablets — depending on the acuteness of the lesion.

Tinea versicolor: Sulphur and Salicylic ointment.

Acne: Restriction of excess fats, carbohydrates, Sulphur and resorcinol paste or Sulphur containing lotion to face. In cystic infected cases, tetracyclines.

Leucoderma: Meladinine paint for small patches.

Plantar warts: Podophyllin 20% in Tr. Benzoin Co. applications.

Palmar warts: If long standing — cauterisation.

Psychiatric and Psychomatic Complaints

There were 288 visits with complaints belonging to this group.

According to the faculties:—

Arts	114
Science	57
Engineering	40
Agriculture	17

This means that 1 in every 7.5 students in the Arts Faculty, 1 in every 6.8 students in the Science Faculty, 1 in every 6.5 students in the Engineering Faculty reported with some psychiatric or psychosomatic complaint. The sex ratio was overwhelmingly male. Only 1 in 23 was a female.

Approaching this problem in another way, 275 consecutive students who visited the clinic were asked whether they had any problems relating to their family, money, studies, girl friends, health. Thirty-seven had — giving again a ratio of 1:7.4 The largest group (13) was about their studies, they felt they were not up to the mark, or they had insufficient time for their studies or they were repeating and were worried as to whether they would pass their examination this time. The next group (9) were worried about their health, the third group were worried about their insufficient financial resources.

Analysing the former group of 238 students; three patients all Chinese, two men and

one woman were schizophrenic and withdrew from the University for further psychiatric treatment. Seventy four were overt cases of anxiety depression. One hundred and sixty seven complained of one or more of the following — insomnia, weakness, tiredness, lethargy, apathy, blackouts, "dizzy spells" — which were really somatic manifestations of anxiety or depression.

Anxiety and depression are common in this age group whether in the University or not. Many experience "identity crises" during which they are trying to formulate their own standards, and to be more or less independent of the ways of life they learned from their parents. This period of ideological confusion is characterised by anxiety, the intensity of which depends on how strict the individual upbringing has been and how strongly he is revolting against it. In most cases it is felt as a vague feeling of dissatisfaction which can manifest itself as weakness, lethargy, apathy, "dizzy spells," etc. The individual does not like to feel vaguely anxious, but gets some measure of relief by focussing this free floating anxiety onto minor physical ailments or deformities, attaching to these a quite unjustified significance.

In many, this sort of attachment is a safety valve and it is better for the students' mental health to tolerate it for some time, letting the student talk about his present trouble and other problems till he satisfactorily finds his own identity himself. Conversion to a strong religious faith or to a political ideology is a satisfactory temporary solution. Such strong religious or political movements do not exist in this University. Many students, as will be shown later, prefer to follow no religion or belong to some religion only in name. Political societies do not exist. Other societies, i.e., Literary–Dramatic Society, Christian Fellowships, Music Society, various Language societies exist, the membership in these is insignificant compared to the number of students in the University. Most students when they enter the University cut down their extra curricular activities and interests and devote all their attention to their studies. Out of 275 consecutive students questioned, only 70 said they had some recreation in the form of games. Those who did not do so claimed that their studies left them no time for such activities. The consequent boredom results in a multitude of complaints, outstanding among which are tiredness and lack of energy in otherwise physically normal individuals.

Three main factors therefore account for this large group of psychiatric complaints.

1. Worry about performance in their studies, the existence of financial problems, real or imagined ill health, or less commonly upset about a girl friend who has not written or whose loyalty is in doubt.
2. The existence of an "identity crisis" in most students of this age.
3. The lack of interest in extracurricular activities, and the lack of participation in sports.

The following brief notes on a few selected cases will illustrate the types that are encountered at the Clinic: —

1. Male, 20, complaining of feeling feverish daily for the last 3 years. No clinical abnormality found in this shy, inhibited student. Later paranoid symptoms directed against other fellow students led to a diagnosis of schizophrenia and he was referred for specialist psychiatric treatment.
2. Male, 21, with difficulty in sleeping for the last 3 months. On questioning admitted being upset about girl friend in a foreign country who had found new friends.
3. Male, 20, with pain inside and round the Rt. eye — diagnosed as migrainous neuralgia — relieved when he could visit his girl friend in Penang.
4. Male, 26, felt feverish, cold and so tired that he had not attended lectures for about two weeks. In a hypnotic trance he visualised the face of one of his lecturers staring at him. It turned out that he had not submitted his thesis to this particular lecturer. Aware of the nature of his symptoms he felt better and resumed his studies.
5. Male, 24, panic attacks with palpitations. As a child had been over-protected by his mother in the absence of his father. Had

been told by astrologer that this was a dangerous period for him. This had coincided with his reading in the Readers Digest about heart attacks. Reassurance in a hypnotic trance, and tranquillisers controlled his panic attacks adequately enough for him to sit through his examination.

6. Female, 20, writers cramp and attacks of dyspnoea — Parents strongly disapproved of her boy friend who belonged to a different religion — Improved with explanation and reassurance.

7. Male, 20, complains of excessive tiredness. No physical abnormality but admitted complete lack of interest in the subject he was offering.

8. Female, 21, complained of fever, insomnia, afraid of being alone in the night — Her brother had been involved in an accident in which one other had died, though the brother was safe.

Preexamination & Examination Strain.

The month preceding the examination is a period of strain to many students who complain of nervousness, severe enough to impair their studies and to prevent their sleeping soundly. In all cases judicious use of small doses of tranquilisers during the day and hypnotics at night helped them to tide over a difficult period.

However during the examination, the strain became abnormally severe in 10 students and took the following forms:—

1. Male, Arts, 2nd yr. — Collapsed in the Examination Hall in middle of his paper, claiming that his "mind was a blank," said that he had slept only 2 - 3 hours every night for the preceding two weeks. Was advised to rest for a couple of days with sedatives at night and resume his examination — but failed badly even in his subsequent papers and was asked to leave the University.

2. Male, Arts, 1st yr. walked out of the Examination Hall halfway through the paper claiming, that due to emotional upset arising out of a quarrel with his roommate, he could no longer proceed with the examination. Persuaded to resume his examination with Drinamyl 1 tablet to help him.

   Subsequently passed his examination.

3. Female, Arts, 1st yr. walked out agitated in the middle of her paper — Claimed that the tension was too great. Despite persuasion refused to continue with her paper — Having done well in the other papers she was allowed to sit for the missed papers when she would sit for her next examination.

4. Male, Agriculture, 1st yr. walked out at the beginning of his paper claiming that his mind was a blank — Persuaded to resume the examination.

5. Male, Science, Final yr. Nausea, vomiting feverish during the examination, severe enough to warrant a diagnosis of gastritis. But had a similar spisode during the previous year's examination at which a diagnosis of gastritis had been made and the patient was admitted to the General Hospital. This time a firm line was adopted and with the aid of largactil and drinamyl went through with his examination and was successful.

6. Male, Science, 2nd yr. walked out in the middle of his paper as he felt he could not concentrate any more and was feeling very drowsy — Claimed he had had no sleep for the previous 2 - 3 nights and was virtually falling asleep on my table — Was allowed to have a few hours sleep and resume his examination in the afternoon. He was subsequently allowed to sit for the supplementary examination in the paper he had not completed.

7. Male, Agriculture, 2nd yr. collapsed after a morning paper and lay on his bed with eyes closed and arms and legs twitching. When I saw him, it was clear that the movements were hysterical and he was persuaded to open his eyes. Promptly he reached for his notes and was trying to read through them before the afternoon paper. He failed in 3 out of 4 subjects, but was allowed to sit for a supplementary examination in them.

8. Male, Final yr. Science felt too nervous to enter the examination hall. With some persuasion and Amphetamine he plucked up enough courage and went in. Immediately after the paper he was carried into the clinic and collapsed on the examination couch, claiming he was exhausted. A weekend followed this paper during which he was sedated but I was called again into the examination hall on Monday morning as the student was feeling faint. With 5 mgm of Dexedrine he rallied round and completed his examination and was successful in it.

9. Arts, 1st yr. Male developed severe occipital headache following the first day's paper. Was admitted to the General Hospital the same evening as a case of suspected subarachnoid haemorrhage. No abnormality was found and he was discharged.

10. Female, Arts, Final yr. Developed vomiting, prostration immediately before and during the examination. With largactil, drinamyl and reassurance she was able to complete her examination and pass it.

Treatment

Anxiety and depression were treated by interviews, where the students' personal and family history and their home situation were gone into and an effort made to trace the source of their symptoms. If the anxiety was due to transient stresses, small doses of Librium 5 – 10 mgm tds or Trilafon 2 – 4 mg tds helped to tide the student over this brief period. Similar attacks of depression responded to Drinamyl in small doses of 5 mg B.D. Other drugs like the Monoamine oxidase inhibitors like Nardil or the imipramine compound Tofranil take about ten days to show any results and moreover their value in neurotic depression is disputed. Amphetamine for a brief period brought relief and put them in a better mood during which they were able to see their problems in a different light. Once the drug is withdrawn, usually in about a week's time, their problems had usually been resolved.

In the treatment of more chronic states of this kind one takes into account the existence of mild chronic anxiety in students of this age group due to the so called identity crisis which the student has to resolve himseld. Repeated interviews, relaxation under hypnosis, reassurance that this mood will eventually lift, and tranquillisers in small doses usually helped to tide the student over such difficult periods.

Students with lethargy and apathy were encouraged to take part in extracurricular activities and in games, in order to overcome the boredom which in many cases was the underlying cause of their symptoms. Sometimes the mild depression which lay behind these lethargic states was treated.

A brief trial was made of the drug Euvitol which was claimed to bring about alertness without the side effects of euphoria and anorexia associated with the amphetamines. Despite the absence of controlled trials and without any objective means of measuring the degree of alertness, one got the impression that this was a useful drug in these lethargic states. But it is only a symptomatic treatment and even a drug that promotes alertness without euphoria is likely to carry the risk of addiction.

Accidents

Accidents accounted for 129 visits to the Clinic. Most of them were minor, caused by falls off bicycles, scooters or motor-cycles. One student died in a motor car accident. Three were admitted to the General Hospital with:—

(a) lacerated wound of the face in a scooter accident

(b) with fracture of the left tibia and fibula in a motor cycle accident

(c) with a crush injury of the hand, also in a motor cycle accident.

All injuries reporting at the Clinic are given a course of immunisation against Tetanus with adsorbed tetanus toxoid. In fact this immunisation is recommended for all students as a prophylactic measure. Only in exceptional cases where the wound is badly contaminated is antitetanus serum given.

Two fractures of the clavicle also occurred. Separate mention is made of some injuries met with in sport.

Rugger:

1. Fracture of nasal bones — No treatment as Xray showed no displacement of the fragments.
2. Haematoma of the Rt. Auricle — Treated by repeated aspiration.
3. Two cases of Haemarthrosis of the Rt. knee — Treated at the Orthopaedic Clinic G. H. by immobilisation of the knee and subsequent exercises. Neither of these cases recovered to the extent that they could participate in Rugger again.
4. Fracture of clavicle.
5. & 6. Partial tears of medial and lateral ligaments of the ankle joint. Treated by strapping in inversion or eversion and procaine and hydrocortisone injections.
7. Chronic pain in ankle joint in a regular Rugger player — No tears of ligaments, no swelling of joint. Probably osteoarthritic in nature.

Hockey

1. Fracture of clavicle following fall — Fractured in the same place again when the student resumed hockey after the first fracture had healed.
2. Partial tear of medial ligament of ankle.

Football

1. Partial tear of Rt. quadriceps due to a misplaced kick.
2. Rupture of the Rt. supraspinatus in a goal keeper who dived to save a goal. Required operative suture of the ruptured muscle.

Badminton

Backward movement with racket broke the spectacles and left glass splinters in the eye. Eye wash removed all splinters except one in the cornea which was left alone on the advice of an ophthalmologist.

Cricket

Fracture of the head of the 4th Rt. metacarpal with subluxation of metacarpal-phalangeal joint while attempting to hold a catch.

The Skeletal System accounted for 170 visits:—

One case of rheumatoid arthritis, 4 cases of traumatic hydrarthrosis of the knee joints, one dislocation of shoulder, and prolapsed discs in four were the important cases encountered.

The rheumatoid arthritis was treated with intraarticular steroid and systemic gold injections. The hydrarthroses were strapped, the dislocated shoulder had to be reduced in the hospital by open surgery. Manipulation was tried in the prolapsed discs with dramatic relief of pain in one. The others responded to rest.

The remaining cases were muscular sprains sustained at sports accidents or were due to bad posture.

Massage, analgesics, muscle relaxants and ultra sonic therapy was the treatment adopted.

Fevers

Three cases of Rubella
One case of mumps
Four cases of malaria

occurred. The cases of malaria were all relapses of previously incompletely treated P. vivax infection. With chloroquine and primaquine radical cure was achieved in all.

Endocrine System

One case of thyrotoxicosis was kept euthyroid on neomercazole for 2 years till she completed successfully her examination.

Genito Urinary System

Twelve cases of pyelonephritis and six cases of renal colic — with Xray evidence of ureteric calculus in four occurred.

One case of Nephrotic syndrome, probably due to Type II nephritis, was maintained albumen free on 10 mgm prednisolone daily for 2 years. He passed his Final Examination with First class Honours.

Two cases of gonorrhoea showed the usual dramatic response to penicillin. One case of suspected syphilis with a history of contact and a positive Khan test was treated with 1.2 mega units of penicillin daily for 10 days.

Cardiovascular System

One case of Mitral incompetence with failure was refused admission.

Two cases of Atrial Septal defect, one case of pulmonary artery stenosis were managed uneventfully.

Two cases of hypertension occurred, one was a boy, extensively investigated in Singapore with the aetiology still in doubt, left the University to carry on with his studies in the U.K., the other a girl with mild hypertension is being investigated in hospital to discover the aetiology of the hypertension.

Eye

Conjunctivitis	47	were treated
Styes	37	
Corneal ulcer	1	

Ear, Nose,

Otitis Externa	23	were treated
Otitis media	9	
Wax in ears	18	
Allergic rhinitis	80	

The treatment of allergic rhinitis is complicated by the side effects of drowsiness produced by the antihistamines which interfered with the attendance of students at lectures.

Nervous System

Five cases of herpes zoster, five cases of migraine, two with migrainous neuralgia were seen.

Surgery

Minor surgery like removal of sebaceous cysts, ingrowing toe nails, injection of haemorrhoids, was also carried out.

During the period of this survey a few studies were carried out on the heights, weights, the haemoglobin levels, the peak flow rates, smoking and drinking habits and some of the mental attitudes of the students:—

1. Height and Weight

The numbers examined and the racial groups were as follows:—

	Male	Female
Chinese	900	225
Malay	261	69
Indian	151	84

The preponderance of the Chinese is due to their being the predominant group in the University. The vast majority of the students fell into the age group 20 – 24.

	Male	Female
Chinese	70	30
Malay	14	5
Indian	21	5

were in the age group 16 – 19.

	Male	Female
Chinese	25	2
Malay	22	6
Indian	8	2

were in the 25 – 34 group.

The height and weight therefore corresponded to the age group 20 – 24.

The mean heights and weights of the different age groups with the corresponding weights for the same age group and heights as given in the Preludin Calculator are as follows:—

Male	Range	Mean
Chinese	5′.0″ – 6′.0″	5′.6″ – 5′.7″
Indian	5′.2″ – 6′.4″	5′.7″ – 5′.8″
Malay	5′.1″ – 5′.8″	5′.4″ – 5′.5″

Female	Range	Mean
Chinese	4′. 9″ – 5′.6″	5′.0″ – 5′.2″
Indian	4′.11″ – 5′.4″	5′.1″ – 5′.1½″
Malay	4′.10″ – 5′.2″	5′.½″ – 5′.1″

Male	Weights	Corresponding weight for the same height and age group in U.K.
Chinese	111–120 lbs.	134–137 lbs.
Indian	116–120 „	137–141 „
Malay	111–120 „	127–131 „

Male	Weights	Corresponding weight for the same height and age group in U.K.
Chinese	85–105 lbs.	106–112 lbs.
Indian	96–105 „	109–110 „
Malay	95–105 „	107–109 „

2. Though underweight the Haemoglobin levels of the students were satisfactory. Haemoglobin estimation was carried out on a total of 215 students. The mean Haemoglobin level of the men ranged from 14 – 15 G % and that of women 12.5 – 13.5 G. The lower level in women is to be expected because of menstruation.

3. In view of the frequent complaints of slight fever by the students and the temperature reading not exceeding the accepted normal of 98.4 — the temperatures in 197 men, whose complaints were mostly of a psychosomatic nature were taken — The mean temperature was found to be 98 with a range from 97.6 to 98.6. The temperatures in women were not investigated because of its variation with the menstrual cycle.

4. While reviewing the medical examination forms sent in by the students it was noted that a high proportion of them had to wear glasses because of myopia — This defect was noted to have a higher incidence in the Chinese group and the figures for each racial group worked out as follows:—

486 out of 820 Chinese men or	1:1.7
185 out of 279 Chinese women or	1:1.5
119 out of 284 Malay men or	1:2.4
21 out of 73 Malay women or	1:3.5
92 out of 229 Indian men or	1:2.5
34 out of 95 Indian women or	1:2.8

While this is a pointer, no racial bias can be considered as proved till the incidence of this defect in the general population has been investigated. Whatever may be the racial bias of this defect, I am informed by a leading ophtalmologist in this country, that myopic children, because of their defect, tend to be more interested in reading and thus to be more likely to be studious and to enter the University, than a non myopic student — The incidence of this defect will therefore be higher among University students than among the rest of the population.

The peak flow rate is a measure of the ventilatory capacity of the individual and is estimated by expiring at maximum strength into a Peak Flow Meter, after a maximal inspiration. This factor was estimated in 163 men and 28 women and an attempt was made to discover if any relationship existed between the Peak Flow Rate and smoking.

The Peak Flow rate varies with the age and height. All the students fell into the age group 20 – 35 and the mean rates according to height were as follows:—

Male:

Height	P.F.R. Range
5.3 – 5.5½	500 – 550 L/mt
5.6 – 5.8½	500 – 550 L/mt
5.9 & over	500 – 550 L/mt

No variation with height was noticed but the range was within normal limits — In this group there were only 35 students who smoked more than 5 cigarettes a day and in this small group no correlation between smoking and ventilatory capacity was discovered.

Female 28 students.

For the height range of 5'.0" – 5'.2" the P.F.R. ranges were as follows:—

250 – 300 L/mt	8 students
310 – 350 „	3 „
360 – 400 „	7 „
410 – 450 „	4 „

An average of 300 L/mt is low for this age group but the number examined is too small for any general conclusions to be drawn.

A questionaire devised to obtain information about the students' attitude to religion, their smoking and drinking habits, the parents occupation and any financial help they may be having to help them in their studies, was answered by 414 students, mostly new entrants, whose composition was:—

	Male	Female
Chinese	205	72
Malay	54	9
Indian	43	20

Some did not answer all the questions asked.

The information obtained was as follows:—

Chinese Males — Chief Racial subdivision. Females —

Hokkien	...	...	84	Hokkien	...	...	31
Cantonese	...	...	56	Cantonese	...	...	25
Teochew	...	...	21	Hakka	...	...	10
Hakka	...	...	29	Teochew	...	...	3
Hailam	...	...	12				

The other information in tabulated form is as follows:—

Religion:	Buddhist		Christian		Sikhs		Muslims		Hindus		No Religion	Total
	Nominal	Active	Nominal	Active	Nominal	Active	Nominal	Active	Nominal	Active		
Chinese Male	72	2	31	32	–	–	–	–	–	–	79	216
Chinese Female	20	5	9	14	–	–	–	–	–	–	24	72
Malay Male	–	–	–	–	–	–	22	32	–	–	–	54
Malay Female	–	–	–	–	–	–	3	6	–	–	–	9
Indian Male	–	–	4	3	6	4	14	3	8	1	–	43
Indian Female	–	–	1	5	–	–	3	–	7	4	–	20
Total	92	7	45	54	6	4	42	41	15	5	103	414

It is to be noted that 200 out of the 414 belonged to some religion in name only and an additional 103 did not claim even this nominal allegiance to any religion.

Fathers' Occupations

	Businessman	Teacher	Civil-servant	Doctor	Engineer	Clerk	Skilled Worker	Unskilled Worker	Pensioner	Politician
Chinese Male	77	21	17	2	1	14	14	3	9	–
Chinese Female	32	4	11	–	–	2	5	1	–	–
Malay Male	6	5	18	1	–	1	1	6	3	1
Malay Female	–	1	4	–	–	–	–	–	1	1
Indian Male	4	3	12	–	–	2	2	4	3	–
Indian Female	1	2	2	2	2	1	1	–	2	–
Total	120	36	64	5	3	20	23	14	18	2

It is to be noted that in the group that answered this question, in 220 out of the 305, the father was a businessman, civil servant or teacher.

Smoking

	0 cigarettes / day	0 - 5	5 - 10	10 - 20	Total
Chinese Male	134	53	7	5	199
Chinese Female	72	–	–	–	72
Malay Male	24	17	4	7	52
Malay Female	9	–	–	–	9
Indian Male	27	15	1	1	44
Indian Female	20	–	–	–	20
Total	286	85	12	13	396

Alcohol

	No drinks	Occasional drink
Chinese Male	115	90
Chinese Female	71	1
Malay Male	35	15
Malay Female	9	1
Indian Male	29	15
Indian Female	20	–
Total	279	122

There were, as to be expected, no heavy drinkers.

Financial Help

	State Help	Federal Help	Firm	University	Other	No outside held
Chinese Male	9	15	2	3	3	175
Chinese Female	–	7	–	–	–	64
Malay Male	11	35	–	–	–	3
Malay Female	–	6	–	–	–	2
Indian Male	4	4	–	–	4	26
Indian Female	–	2	–	–	–	18
Total	24	69	2	3	7	288

Marriage Choice

	Own race only	Any race
Chinese Male	102	57
Chinese Female	40	6
Malay Male	30	16
Malay Female	4	3
Indian Male	18	20
Indian Female	11	5
Total	205	107

Immunisation

Immunisations against Tetanus and Poliomyelitis are offered to all students. Anticholera innoculation was given to students, staff and their families twice in 1963 each time about 2,000 being innoculated.

Health Education

Notice boards of the Student Health Service are erected at prominent places in the University and information about immunisation against tetanus and poliomyelitis is displayed. The harmful effects of smoking cigarettes and posters advertising this fact are also to be found on these boards. Posters obtained from the Royal Society for the Prevention of Accidents illustrating the mouth to mouth method of Artificial Respiration have been put up at prominent spots on the Campus.

Summary:—

The problems encountered in running a Student Health Service for about 2,000 University students are discussed. The relative frequency of illnesses in the various systems and methods of treatment employed are noted.

The mean heights, weights, the haemoglobin values, the basal temperatures, the peak flow rates for various groups have been worked out.

Some answers obtained through a questionnaire issued to students are tabulated.

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A SWEAT GLAND TUMOUR OF THE MIXED – SALIVARY TYPE OF THE RIGHT MIDDLE TOE

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and
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The criteria for the diagnosis of this tumour are (i) "that the tumour must arise in the skin or from sweat glands, (ii) that it must be composed of epithelial elements intermingled with cartilage or myxoid tissue in such a way that the epithelial cells appear to be continuous with these elements and not separated by a basement membrane" (Stout & Gorman 1959). Lennox et al (1952) traced the literature and found that Nasse was the first to report a case (1892), and Penisi's case (1908) was the first in which site was recorded as unmistakably in the skin. Stout and Gorman studied 39 cases and accepted another 95 cases from the world literature.

Site

Their breakdown figures regarding the sites of these 134 mixed tumours are:—

Head:	23
Face:	68
Neck:	0
Trunk:	12
Upper extremity:	12
Lower extremity:	19 (Thigh 6, Leg 6, Foot 7).

The face has the highest incidence, but a note of caution is made here so as not to include tumours of the nearby salivary, mucous or serous glands in this region. The neck, the upper arm, the anterior abdominal wall, the buttocks, the scrotum and the penis are sites where no tumour was found.

Age

It occurs at any age, but the highest incidence is between the 3rd and 5th decades.

Sex

Besides the head, the tumour is equally distributed between the sexes. In the head area it is 3:1 in favour of males.

Size

The smallest tumour was 2 x 1 mm. and the largest was 12 cm. in diameter. The latter was found on the chin of a 22-year-old Chinese who had it for 10 years.

Duration

The mean duration of the tumours was 7 years, and the extremes were 3 months and 40 years.

Malignancy

Only 1 case was accepted as a bona fide malignant tumour by these authors.

Case History of the Present Case

A 51 year old, male, Chinese, noticed a nodule on the undersurface of his right middle toe 6 years ago. It has since grown to its present size of 3″ x 2″. One month previous to the operation, a discharging sinus developed with the onset of pain. On examination it was a firm and tender mass with superficial ulceration, on to which the sinus discharged.

The right middle toe was amputated at the metatarso-phalangeal joint, and the patient had an uneventful recovery thereafter.

Gross Description

A pedunculated rounded protuberance measured approximately 5 cms. in diameter was found attached to the inferior surface of the toe. The tumour was covered by skin all round except for a localised area of ulceration approximately 15 mm. in diameter.

The cut surface was moderately firm and fleshy-looking and had a mucoid and slippery feel. It was well demarcated but not encap-

sulated. A sinus extended from the base of the ulcer to the distal phalanx through the tumour.

FIGURE I — The tumour as seen from in front.

FIGURE II — Undersurface, showing superficial ulceration and discharging sinus.

Microscopic Picture

The tumour is well circumscribed and is separated from the epidermis by a distinct layer of the dermis. In the latter are remnants of normal sweat gland structures, some of whose ducts are dilated and contain PAS — positive material.

The tumour itself is situated in the lower dermis and subcutaneous tissue, as adipose tissue becomes more abundant in the lower reaches of the tumour. The gangrenous sinus tract is lined by inflammatory necrotic tissue, and it is near this tract that the tumour is seen to approach the epidermis (Fig. III). At this junction groups of tumour epithelial cells appear to drop out from the epidermis, especially from the rete pegs (very similar to the way naevus cells drop off from the epidermis).

The tumour epithelial cells are all uniform in character. The nucleus is oval, and has well formed and mature chromatinic granules and a small basophilic nucleolus. The cytoplasm is eosinophilic and its quantity varies with the crowding and congestion of cells (i.e., it varies inversely with the number of cells). The cells are mainly spindle in shape, but in smaller aggregates they may be polygonal or cuboidal.

The tumour cells occur mostly in irregular masses, columns and sheets; in many areas concentric whorls are also seen (Fig. VIII).

The irregular masses are broken up in places by hyaline stroma, and where the epithelial cells abut stroma, they appear to transform into the different types of stromal cells, e.g., fibroblast, chondrocytes and myxomatous cells (Figs. III, IV, V, VI & VII).

It is only in rare areas that one sees tubular structures which are lined by either a single layer or a double layer of cells. This gives its sweat gland origin away.

Near the sinus tract, squamous differentiation of the tumour cells can be seen. In several loose areas oncocytes appear to be straggling in a hyaline stroma.

The stroma is mainly hyaline in type (Fig. VII). Next in frequency is the myxomatous variety (Fig. V). Collagenous, fibroblastic and

FIGURE III x 45 — Note approximation of the tumour to the epidermis near sinus tract which is just at the left edge of picture. Note droppings of epithelial elements from epidermis.

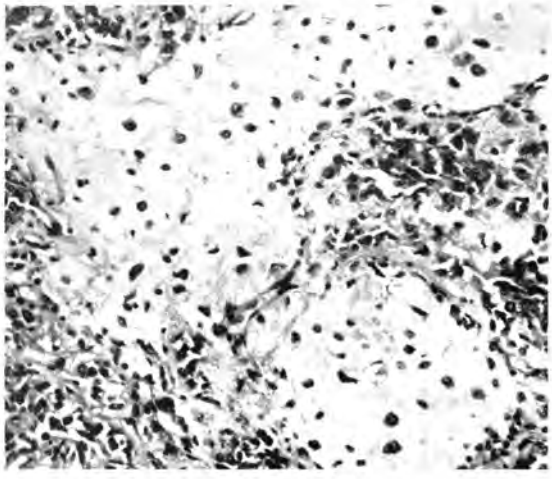

FIGURE IV x 150 — Note epithelio-cartilaginous metaplasia and incorporation of myoepithelial cells as chondrocytes.

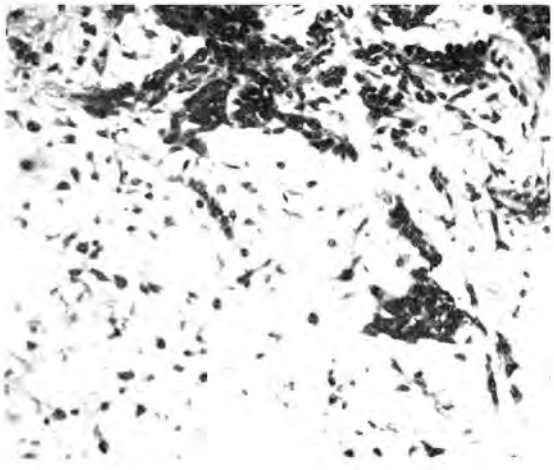

FIGURE V x 150 — Note myxomatous stroma beside groups of myoepithelial cells and incorporation of the latter into the myxoid tissue.

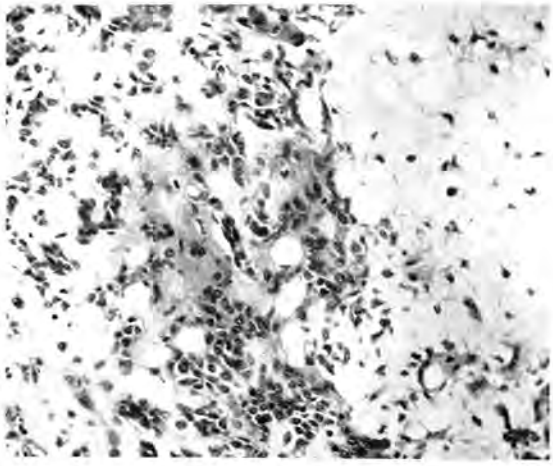

FIGURE VI x 150 — Note myxoid tissue to the right and epithelio-cartilaginous complex at left. Note also double-layered structures at bottom.

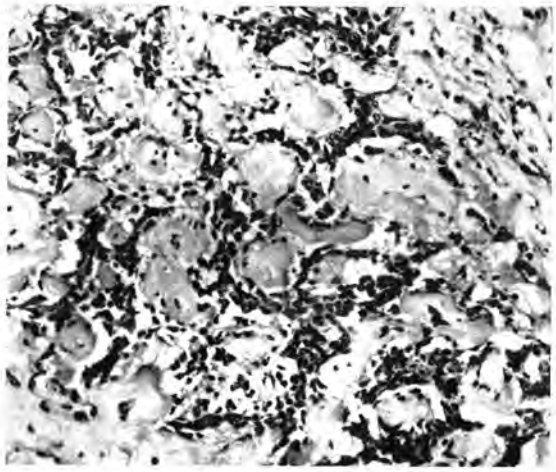

FIGURE VII x 150 — Note hyaline stroma strangling myoepithelial masses.

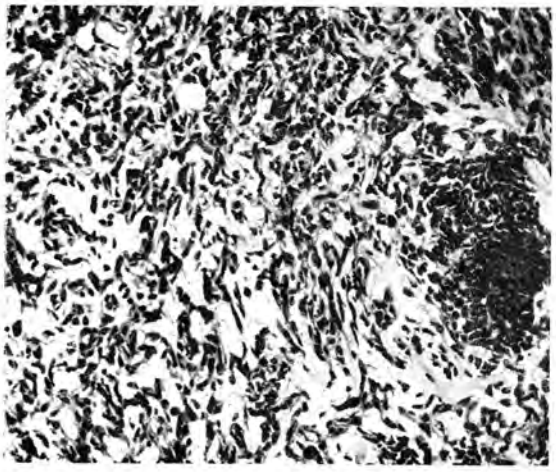

FIGURE VIII x 150 — Note typical cellular areas with a whorl of myoepithelial cells at right.

adipose varieties come next. Lastly, several groups of cartilaginous areas (Fig. IV) are also present. All the stroma cells can be seen to be fed by the epithelial cells, and in junctional areas they can be seen to be gradually included into the stroma. There is no basement membrane around any of the epithelial masses, which abut directly against the stroma, and in some places the stroma appears to be the product of the epithelial cells.

PAS and mucicarmine stains are examined and the stroma shows a much greater affinity for the PAS than the mucicarmine stains. Mucicarmine positivity appears to be greatest in the myxomatous areas and within some epithelial groups which are generating mucine. Only in these areas does one see some occasional mucicarmine positivity in some of the epithelial cells. The recently secreted substance appears most positive and remains so when not allowed to come in contact with the stroma, i.e., when they are still amidst epithelial masses. However, when in contact with the surrounding stroma, the positivity lessens and disappears completely in the well established stromal areas. The positivity also appears to concentrate around the cellular borders of the secreting epithelial cells.

Discussion

The only normal apparatus in the skin that has a double-layered structure is the sweat gland. Normally both the secretory coils and ducts are lined by an inner single layer of columnar or cuboidal secretory cells and an outer layer or layers of spindle-shaped myoepithelial cells. If in any given tumour in the skin, a double-layered structure is recognised, then one is dealing with a sweat gland tumour. The exceptions to the rule are of course when the tumour occurs in regions around the breast and salivary glands. These two organs are also blessed with the same double-layered structure.

The sole agent in producing the "mixed salivary" pattern is the myoepithelial cell (Almost all the epithelial cells in this tumour are myoepithelial cells). This myoepithelium is capable of producing a true mucin which when it comes into contact with stroma becomes a connective tissue mucin. It is by the further conversion of this so-called connective tissue mucin and the incorporation of the myoepithelial cell as the chondrocyte that true cartilage is finally elaborated.

Lennox, Pearse and Richards have followed the above changes histochemically and proposed a schematic change thus:— "epithelial mucin —— cyst mucin —— stromal mucin —— cartilage."

Thus for a tumour in the skin to be labelled as a "mixed salivary" type, it requires to have this chief criterion of epithelio-cartilaginous metaplasia.

And for such metaplasia to occur, large quantities of myxoid tissue are invariably present as well.

However, if tiny bits of cartilage are missed in the sections and there is a paucity of myxoid tissue due to small production of mucin, a tumour is most likely to be called a simple hidradenoma or a myoepithelioma. Thus a "mixed salivary" type of sweat gland tumour is no more than a hidradenoma or a myoepithelioma which has elaborated large quantities of mucin, and if given time, cartilage. In the salivary gland, pathologists are less fussy; for in this organ all myoepitheliomas are labelled as mixed salivary tumours (pleomorphic adenoma) even if there is no cartilage or large quantities of myxoid tissue!

Summary

A mixed salivary tumour of the skin of 6 years duration is described in a 51-year old Chinese.

The morphogenesis of its pleomorphic stroma is discussed.

ACKNOWLEDGEMENTS

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MIGRATION AND SCHIZOPHRENIA — A REVIEW AND CASE REPORT

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This paper is not meant to answer questions, but in fact, to pose some questions. This may seem an unsatisfactory state of affairs, but Psychiatry is in its infancy and more questions can be asked of it than answered.

Migration had occurred from time immemorial. All biological organisms have tended to move in search of fresh pastures, to escape from the overcrowding and struggle for existence in their home land. The migrating population is a selected one. For one reason or other which varies with each migratory occurrence, a different segment of the population migrates. Some of these reason are multiple and difficult to interpret.

Psychiatrists have always visualised and hoped for psycho-social factors to explain some of the distressing mental illnesses which afflict mankind. This hope, however, is contained by the new realisation, that almost all mental illnesses have a complex multifactorial causation.

A genetic predisposition is almost established in the syndrome, called Schizophrenia. However, this genetic predisposition is not absolute, all studies have shown that psychological or psycho-social enviromental factors play a part as well. It is to discover these factors (which we hope are preventable) that epidemiologists have been getting excited.

Those who are biologically orientated like to explain away the differences found epidemiologically between two groups of cultures. Those who are socially orientated try to advance hypotheses (W. Dunham). The finding of significant rate differentials between different subgroups of population has been therefore a major preoccupation of epidemiologists. The psycho-social characteristics of the two subgroups come under intense study, and correlations are sought with the rate differences discovered by statistical methods.

One of the fields in which this work has been most emphasised is migration and mental disorder, in particular Schizophrenic disorder.

In America much research in the early part of this century, showed a higher prevalence rate of Schizophrenia among immigrants when compared with natives. These studies and many more subsequent ones, used hospital data (which in most cases are unsatisfactory). The work quoted above lacked sophistication in statistical design, and used nothing but crude rates.

Malzberg who standardized rates obtained from hospital figures as regards sex, age, race, etc., showed that much though not all of the differences in rates were false. Odegaard studied carefully the rates for Norwegians who migrated to Minnesota with Norwegians in Norway. He found distinctly higher rates for the immigrant Norwegians in Minnesota.

Clark performed another study in which he too recorded a higher rate among immigrants than natives. It has been the impression too in U.K. that immigrants have a higher prevalence rate of schizophrenia than the natives. In Singapore, however, Murphy concluded that native rates were higher than immigrant rates. In Hawaii psychotic breakdown was greatest among Okinawans though Moloney, a Psychiatrist, asserted that psychosis was rare among native Okinawans, in Okinawa itself.

Migration can also mean movement within a single country. Odegaard found, surprisingly enough, that mental disorder rate was higher only in migrants in Oslo. In fact other excessively mobile groups were more healthy.

At this stage I would like to beg your indulgence, and stretch the meaning of the word migration. I would like to use it also for social mobility (migration strictly being, geographic mobility) as the common result,

thinking in Psychiatric terms, is a movement into a different cultural group.

Now, social mobility may be a movement from one social level to another. This kind of movement is becoming very common these days.

Hollingshead and Redlich, found that the lowest social class had the highest rate of schizophrenia and vice versa. As one explanation of this phenomenon postulates a "drift," a form of passive migration, I mention it in this context.

Another finding which has been repeated a number of times is that of Farris and Dunham, that the highest concentration of schizophrenics occurs in the central disorganised parts of a city. Again as above, one explanation of this phenomenon is "drift."

It is clear, therefore, that general agreement seems to lie in this field. However, certain deficiencies have to be pointed out in these studies.

First of all hospital data have been used to estimate the incidence of mental illness. In a country where an adequate coverage exists this estimate may approximate to the truth. In most countries, however, hospital data are a poor measurement of the true incidence of the illness.

Secondly, problems inherent in all work in Psychiatric Epidemiology have to be faced. The definition of a case, is something one cannot do with any degree of accuracy. The conclusion from comparison of work by different authors is of doubtful significance. It has been shown (Eaton and Weil) that the more intensive the investigation the greater the number of cases. The finer the mesh of your net, the more psychiatric pathology you discover. Rennie, in the Midtown Survey found that 75% of the population had symptoms of anxiety. This is a warning against trying to be too wide in your definition.

Thirdly, two populations cannot be compared unless the variables we are not interested in are controlled. Age and sex structure of the population alone will produce differential rates in Schizophrenia. Occupational status and social class are other factors. It is obvious that an immigrant population is very different in these characteristics from the host population. Most immigrants are young males. They often come from a lower social class which feels the pressure in the home country. Again, voluntary migration produces a different type of individual from forced migration. All these factors are going to operate in the rate differentials you laboriously uncover.

However, we in Psychiatry are never used to getting ideal results. We have to work somehow with rather shaky data. Psychiatrists are, however, convinced that something will be turned up by their efforts.

It would seem tentatively then, that higher rates of schizophrenia occur among migrants. The correlations having been established, it is hoped to discover a causal relationship, if any. Of course, it is realised that association need not necessarily mean causation.

If we examine the process of migration from the psychological point of view, we are first struck by the fact that the immigrant is going to have some difficulty in adjusting himself. He has come to an alien culture, he has to learn the language and the rules by which this new society lives. To make it worse he is one of the minority and has lost his own traditional props. It is not surprising therefore that Hippocrates long ago recognised that "mental perturbation" occurred in immigrants. A term "nostalgia" was used for the homesickness, which many of us have experienced in a foreign environment. Some even went further and described an "alien's paranoid reaction." Again most of us can confirm this reaction. Very few of us would have had absolutely no feelings of suspicion and fear when set among a large group of foreigners.

I would maintain, however, that none of these reactions are qualitatively similar to Paranoid Schizophrenia which they most resemble. Paranoid reactions are based on projection mechanisms which have been demonstrated in normal psychological processes. This point, however, is controversial.

The association having been demonstrated, psychiatrists with sociological orientation,

using the pointers mentioned above, suggest that life in an alien culture is in itself *a factor* in the production of schizophrenic illness. It is visualised that social isolation, the loss of social cohesion, an "anomie" using the term of Durkheim, tends to precipitate the schizophrenic illness. Anomie, seems to have been demonstrated as a Potent factor in suicide and so was naturally thought of in this context. The other view is that there is a great tendency for the pre-schizophrenic (i.e., a person who is going to develop schizophrenia) to move away from his traditional group. Inter-personal relationships are difficult and he moves on searching for a kind of loneliness. In other words he actively seeks isolation. This resulting release from "burdensome relationship" may indeed be therapeutic, as one British study shows that discharged schizophrenics do best when they go out and live with strangers rather than their own wives or mothers.

However, a number break down and this increases the rate of schizophrenics in the immigrant group. This is the view taken by Odegaard who called them an "adversely self-selected group."

A third explanation is that the stresses of the process of migration itself may contribute to the development of the disorder. Odegaard, however, "found no colouring of the illness in relation to migratory stress" which would indicate that the latter was productive of the illness (quoted from Mayer-Gross, Slater, Roth).

In the case of the findings of high rates of Schizophrenia in the lowest social class two explanations have been put forward. One is that conditions in that class itself contribute to the development of Schizophrenia. The other explanation is "drift" a form of passive "migration." In support of the latter Morrison in England found that fathers of Schizophrenics were rather evenly distributed throughout the social classes.

The finding of Farris and Dunham could also be explained by postulating that psychosocial conditions of disorganised environment (mainly, isolation) produce the disease. A drift theory (here an active process of self-segregation) is favoured by Gerard and Houston. Hare in his Bristol work found evidence supporting both hypotheses.

Malaya* is one of those rare countries in which nearly half the population has come from elsewhere, and what is more, the immigrants are not of one racial or *cultural stock and differ markedly* from the host population. Malaya can, therefore, be the happy hunting ground for the social anthropologist, and the epidemiologically minded psychiatrist. An experiment of nature can be utilised. The lack of staff and proper hospital data have made it impossible to investigate these changes at present. A field survey is long overdue. The population of the Federation is about 7 million of which about half are Malays or of Indonesian origin, one third are Chinese and one tenth Indians. Eurasians and Europeans form only about 2%.

The main migration of the Chinese occurred from about 1880 to 1920. The increase of the population in the early part of this century is (mainly) due to immigration. After about 1931 there has been a sharp drop in Chinese immigration and after "Merdeka" (Independence) to all purposes, nil.

This is rather disappointing to us, as it would seem that the natural experiment was over while we were sleeping. Most young people to-day would have been born in Malaya. Nevertheless, to discover significant differential rates between recent, and not so recent residents and the various races is going to be very interesting.

I shall now come to the case. I hope that the impression is not created that by presenting one case of Schizophrenia associated with migration I am going to establish any case for whatever point of view. Sainsburg and Stengel, felt that careful individual clinical studies should be associated with the study of mass aspects of suicide. Epidemiological hypotheses are postulated on clinical hunches, and clinical examination follows the establishment of an epidemiological hypothesis. As schizophrenia has a multiple aetiology and as we do not know whether we are dealing with an entity, a syndrome, or even an individual

* This paper was prepared before the Formation of Malaysia and all references to the Federation of Malaya exclude all other Malaysian territories.

personality reaction, isolated studies are of no value by themselves. However, I feel Sainsbury's contention can be extended to this field and detailed examination of cases which are unusual in respect to migration may contribute to the advancement of knowledge.

My case is one which did not develop schizophrenia with emigration from Malaya and on his subsequent stay in a foreign country *till four years later*. His illness developed during the last three months of his stay in a foreign land and reached its peak one week after his return to his own cultural background and thus presents some unexpected features.

CASE A

Mr. A, a young energetic boy conceived the idea of hitch-hiking to a European country. His pre-morbid personality, as observed by his school report, was that of an extroverted highly intelligent youngster keen on athletics and a "leader." He came from a relatively poor family and his idea of hitchhiking was taken kindly by everyone concerned. He was encouraged by the Outward Bound School and even by officials in the upper echelons of society.

What is remarkable is that this youngster successfully made his way to his desired destination. He must have had a winning and pleasant personality, as he had obtained help from many people.

He reached country B (the country will be unnamed to prevent his identification and consequent embarasment to relatives) and got through a special course in a world famous University. Throughout this period he was greatly liked, helped and admired by men of professional standing. He seemed to have made friends easily and saw a great part of the country with organised student groups. He seems to have made an excellent adjustment at that stage. Two years after his arrival, however, he had a mild depressive episode which cleared up quickly. I could find no evidence that there was any likelihood that this was an early stage of his schizophrenic illness (a debatable point, however). He made a full recovery moreover, and then went to another European Country (Country C) in which, though he lacked an entrance qualification, he was judged suitable to take up a course in the University. He was so liked by the Professor, that he tried to help him to get admission to the University of Singapore. The University of Singapore very favourably reacted to this and even wanted to make special arrangements to enable him to sit for the entrance examination for this University in Country C.

I have some letters from the people who knew him in Country C, who deny having had *any suspicions* of him developing a mental illness. He, in fact, made an extraordinarily good adjustment, and only during the last three months of his say in this country, (he had been in this country for nearly two years) did he begin to have symptoms. The first symptom seemed to have originated suddenly. He began to feel that he was changed in some way after accepting a cigarette from an Indonesian, whom he met in a train. This symptom is of the nature of a primary delusion. The other symptoms he had at this stage were rather mild and his illness was *not apparent yet*.

In fact, when he returned to Malaya (he was planning to enroll in one of the departments of the University) he was seen by one of the academic officials who wrote "as a qualified social worker with many years of experience of dealing with disturbed persons I think I would have detected any *overt* indications of disturbance at that interview" (italics are my own).

One week after his return the illness took a fulminating form. He suddenly felt that Malaya was changed and Communistic. He became extremely suspicious and fearful. He began to hear voices. He had clearly developed into an undoubted case of Paranoid Schizophrenia.

The case that has been reported is of great interest. We have here a young man withstanding the so-called adjustment difficulties of "acculturation" living an active and useful life, adapting well while in an alien culture only to succumb to a paranoid schizophrenic illness during the last part of his stay there, when one would expect *adjustment difficulties* to be the least intense.

Even if the depressive episode were taken as the beginning of the illness *a good two years* intervened between his arrival and illness.

The other questions that arise are, are *readjustment* difficulties (to his original native environment) a factor in the development of his illness? It would be remarkable indeed if this were so. Could five years in a foreign country produce such a change that he finds reversion to his native culture so traumatic? Further, I feel that his illness commenced *before* his return, though it became overt only after his arrival in this country. For the same reason the stress of travelling would mean even less as a causative factor. It must be remembered moreover that he hitchhiked to Europe, but returned by air.

Could he have been compelled to travel, by that strange pre-morbid characteristic postulated of Schizophrenia? This might plausibly explain the association of his illness with migration. However, the psychosis developed more than four years after he left home, but this still does not abolish this theory.

Are all these factors quite unrelated to his illness which is of patho-physiologic origin and unrelated to any psycho-social cause?

This individual case is an enigma as is the illness in general.

I must now close this review and case report, having posed more questions than answers! A very rough and ready examination of the figures of the Central Mental Hospital invites some further questions. The population of our "catchment area" by race can be divided in percentages into:—

Malaysians	42.7%
Chinese	41.4%
Indians	13.9%
Others	2%

TABLE I

(To avoid confusion, please note, the term "Malaysian" is used according to the census).

This is based on the 1961 estimation of the population of the 1957 census.

The proportions in percentages of cases diagnosed as schizophrenia (first admission) in 1962 were:—

Malaysians	27.0%
Chinese	52.4%
Indians	19.7%

TABLE II

It can thus be seen that Malaysians who form 42.7% of the population produced only 27.9% of the schizophrenics and the Chinese who are 41.4% of the population produced 52.4% of the schizophrenics.

Though I have not made an estimate for the population in 1962, the natural increase in population in 1960 being 32.1 (per 1,000) for Malaysians, 29.8 for Chinese and 34.7 for Indians would seem to indicate that the relative proportions would be approximately the same in 1962 as during the 1961 estimation.

The differential proportions noted appear to be significant and may mean almost anything, from the reluctance of the rural Malay to come to hospital, the low visibility and high tolerance by others of his race for psychoses, the distance from hospital and consequent difficulty in getting to hospital, or *even an actual lower rate* of Schizophrenia among the Malays who are the longest settled race in the country. If the proportions in percentages are taken for all mental disorders admitted we get (first admission 1962):—

Malaysians	28.9%
Chinese	50.1%
Indians	21.0%

TABLE III

It will be noticed therefore that there is very little difference in the proportions as compared with Table II.

Unless the aetiological factors pertaining to schizophrenia are shared in common by all other mental disorders (a state, I consider, most unlikely) the percentage proportions in Table III would indicate that the Chinese choose hospitalisation more intensively. This

would be more so as the Chinese being mainly an urban population, would find that psychotic behaviour is easily differentiated and not tolerated.

This paper is of a preliminary nature and I hope when facilities become available a proper census or field survey based on unbiased samples will provide many answers, obscure in Psychiatry all over the world.

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CHORIOCARCINOMA

Case with unusual clinical presentation and apparent long survival

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Although choriocarcinoma is relatively uncommon in Western countries, it has attracted a vast medical literature, and the vagaries of its behaviour have been meticulously documented. No tumours in gynaecological practice have given rise to more interesting and more challenging problems of clinical and pathological diagnosis.

Case Report

The patient was a 38-year-old Chinese woman, first admitted to the General Hospital, Johore Bahru, on 7-7-63 with a history of pain of sudden onset, localised to the right hypochondrium. The pain was excruciating, and was associated with fever and recurrent vomiting.

She was found to be febrile, pale and mildly jaundiced. The abdomen was guarded and tender, especially in the right upper quadrant. Murphy's sign was positive; both the liver and the spleen were found to be moderately enlarged.

Straight X-ray of the abdomen showed several small gall-stones. The serum bilirubin was 1.9 mgm%; the haemoglobin was 6.0 gm%. She had a reticulocytosis of 12.2% and her peripheral blood film showed marked hypochromia, anisocytosis and poikilocytosis.

The patient was managed conservatively as a cases of cholelithiasis with biliary tract infection and colic. Recovery was uneventful and she was discharged from hospital about a week later.

On 4-8-63, i.e., four weeks later, the patient was re-admitted to hospital for another episode of severe abdominal pain. There was no fever or vomiting. The clinical findings were similar to those at her previous admission. Although her initial pain was promptly alleviated by pethidine and atropine, there were subsequent episodes of milder pain. She also had a mild intermittent temperature of 99°–100°F (with an occasional peak of 101°F) after admission.

In view of her marked anaemia, mild icterus, hepato-splenomegaly and radiologically demonstrated cholelithiasis, she was investigated for an intravascular haemolytic process; none was found. There were no malarial parasites in the many blood films examined. Ascaris and ankylostoma ova were found in the stools, but there was no evidence of **Entamoeba histolytica** infection. X-ray of the chest showed that the right arch of the diaphragm was markedly raised (Fig. 1).

Fig. 1

As she had experienced an attack of dysentery several months previously, it was decided to treat her amoebic liver abscess, which is quite commonly seen in Johore Bahru Hospital. Emetine injections were started and

aspiration of what appeared to be a liver abscess was attempted on 26-8-63. The aspiration needle was inserted under local anaesthesia; there was no pus, and only about 2 ml. of blood was drawn into the aspiration syringe. About 10 minutes after the attempt at aspiration began, the patient suddenly showed signs of acute cardio-respiratory distress and rapidly went into shock. Resuscitative measures were instituted, but the patient expired within 15 minutes.

At necropsy (Dr. P. S. Raman), several pints of blood-tinged fluid were found in the peritoneal cavity. The liver was grossly enlarged, being studded by numerous dark-red, haemorrhagic nodules up to 8 cm. in diameter. Some of these were raised above the liver surface. There was a minor laceration on the surface of the largest nodule, which appeared to be the site of entry of the aspirating needle. The cut surface of the nodules showed a variegated appearance with alternating zones of dark and light red (Fig. 3). A few small

Fig. 3

pigment stones were present in the gall-bladder. The spleen was two to three times normal size, There was no gross abnormality of the uterus and adnexae externally. All other organs, including the lungs, appeared normal. The brain was not examined.

Histological examination of the liver (Prof. J. B. Duguid) revealed choriocarcinoma (Fig. 4).

The patient's past history, which was later obtained from the previous case notes and from the husband, was interesting and significant. She had three children, who at the time of her death were 11, 9 and 7 years of age respectively.

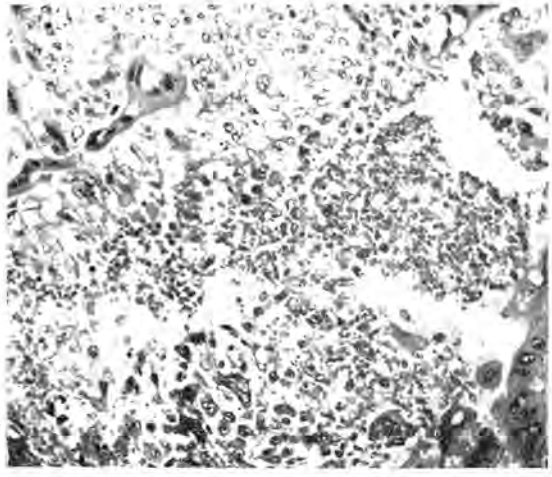

Fig. 4

Some 5 years previously, on 10-11-58, she was admitted to the District Hospital, Kluang, complaining of vaginal bleeding of about 3 weeks' duration. At that time she had been amenorrhoeic for 4 months, but the uterus was disproportionately enlarged, corresponding in size to a 20–24 weeks gestation. Foetal parts could not be palpated and their absence was radiologically confirmed. The patient was pale and showed signs of toxaemia of pregnancy. A diagnosis of hydatidiform mole was made. Hysterotomy, via a lower abdominal incision, was done on 15-12-58, and molar tissue was evacuated.

About 25 days after hysterotomy she complained of a sudden pain in the right chest. The percussion note over the base of the right chest was impaired and breath sounds were absent. Chest aspiration was attempted, yielding only a few ml. of blood-stained fluid.

On 16-3-60 the patient was again admitted to the District Hospital, Kluang, complaining of vaginal bleeding of 12 days' duration after having been amenorrhoeic for 3 months. She was febrile, the uterus was clinically enlarged in proportion to the period of amenorrhoea, and a diagnosis of "septic abortion" was recorded on her notes. X-ray of the chest showed elevation of the right arch of the diaphragm (Fig. 2). Before this could be investigated further, or the uterus evacuated, for reasons

not clearly known, the patient left the hospital of her own will within a week of admission. The vaginal bleeding was said to have gradually improved without further treatment.

Fig. 2

Some time in 1961 the patient was said to have a mild haemoptysis on one occasion. There were no other associated symptoms and treatment was not sought. Her menses had been "irregular and scanty" since she recovered from the "septic abortion."

Comment

We postulate the following sequence of events:—

(1) 1958 — Hydatidiform mole.
Clinical evidence of lesion at the base of the right chest.

(2) 1960 — Radiological evidence of a hepatic lesion, possibly metastatic choriocarcinoma.

(3) 1961 — Haemoptysis, possibly from a choriocarcinoma nodule in the lung.

(4) 1963 — Death from massive choriocarcinomatous deposits in the liver.

The arguments in favour of this hypothesis are as follows:—

In 1958 the patient had an indubitable hydatidiform mole. This may have given rise to a choriocarcinoma, as some 40–50% of chariocarcinomata are preceded by a mole (Novak and Novak, 1958; Willis 1960). Such a choriocarcinoma may not become clinically evident for several years (Hunter and Dockerty, 1955; Brown et al 1940; Natsuma and Takada, 1961).

The aetiology of the chest lesion seen at this time is difficult to evaluate. An X-ray of the chest was taken, but regretably the report was not written into the case notes and the film is not now traceable.

In 1960 there was evidence that the patient was pregnant. However it is difficult to be sure that the diagnosis of "septic abortion" was correct, as the uterus was not evacuated. The X-ray of the Chest showing a degree of elevation of the right arch of the diaphragm (Fig. 2) closely resembling that seen in 1963 (Fig. 1) suggests that the choriocarcinomatous deposits were already there in 1960. Lepow 1959) who reported coexistent normal pregnancy and choriocracinoma believed that the malignant tumour could originate from the trophoblastic tissue of the existing pregnancy. As the diaphragm was already appreciably raised in 1960 at the time of the "abortion," we do not think that the choriocarcinoma in our patient originated from the "pregnancy ending in abortion," but rather the choriocarcinoma must have preceded the "abortion" by some time.

The absence of a lung lesion at necropsy does not necessarily mean that the haemoptysis in 1961 could not have been due to a choriocarcinomatous nodule, as such lung nodules are known to disappear spontaneously (Novak and Novak, 1958; Chua and Hou, 1957).

The fatal illness in 1963 showed beyond doubt the presence of large masses of choriocarcinomatous tissue in the liver. It is unfortunate that the uterus was not examined in detail, but there was no evidence of gross involvement. Disappearance of the primary uterine tumours in patients with metastatic

choriocarcinoma is, however, not unknown (Novak and Koff, 1930; Novak and Novak, 1958).

The discovery of choriocarcinoma in a patient whose presenting symptoms and signs suggested biliary tract infection with colic is of great interest. The repeated episodes of pain in the right hypochondrium were probably, at least in part, the result of haemorrhage into the malignant nodules with stretching of the liver capsule. The fever, the anaemia, and the icterus could be explained on the basis of breakdown of this blood.

Discussion

If it is assumed that the interpretation of the sequence of events is correct, then the survival of this patient for at least three years is of great interest. Choriocarcinoma is generally regarded as one of the most highly malignant of all neoplasms. It is generally fatal within 6 to 12 months with a one-year survival rate of only 17.5% (Novak and Novak, 1958). In fact, for many years it was an axiom that if the patient survived she probably did not have a choriocarcinoma. In a group of 7 patients, Novak and Seah (1954) observed that, with no treatment, all were dead within 6 months. There are, on the other hand, recorded a considerable number of cases of long survival. These, however, were almost invariably patients who had been treated radically. Of the 74 cases studied by Novak and Seah (1954) from the Mathieu Memorial Chorionepithelioma Registry (MMCR), 13 remained well, 11 of them for more than 2 years and 2 of them for more than 1 year. Subsequently the surviving patients from the MMCR series were followed up by Brewer et al (1961), who reported survival of over 5 years. Long survival was also reported by Brews (1939) and Smallbraak (1957).

In this case the liver appeared to be the only organ with choriocarcinomatous deposite. The finding of choriocarcinoma metastases in the liver is not uncommon, but in cases where hepatic metastases are found other organs are almost invariably involved. Brewer et al (1961) in their follow-up of the 21 cases from the MMCR series reported the presence of metastases in 6 of the patients: none involved the liver. Willis (1960), writing on the subject of remote metastases in choriocarcinoma, referred to 25 necropsies, 13 of which had metastases in the liver. In 9 cases in which the spleen or the intestine showed metastases the liver nevertheless escaped. Chan (1962) in a series of 17 cases with necropsies found 11 with metastases in the gastrointestinal tract without specifically mentioning the liver. Hou and Pang (1956) found hepatic metastases in 14 of their 28 necropsied cases of choriocarcinoma. Park and Lees (1950), analysing 516 cases of choriocarcinoma, reported hepatic metastases in only 43 cases, whereas metastases in the lungs and vagina were found in 115 and 105 cases respectively.

It is to be noted that many aspects of this fascinating case must perforce remain undiscussed as investigations were not as complete as they might have been. These shortcomings are much regretted.

Summary

1. A case of choriocarcinoma with an unusual presentation is reported. The patient, who had a hydatidiform mole 5 years previously presented with features suggestive of a biliary tract infection with colic. She died following an attempt at aspiration of what appeared to be a liver abscess. At necropsy the liver was found to be the site of multiple nodules of choriocarcinoma.

2. The apparent long survival without treatment, the hepatic metastases, and several other features are discussed.

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THE BACTERIOLOGY OF GASTROENTERITIS IN CHILDREN BELOW THE AGE OF TWO YEARS

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The gastroenteritis syndrome of diarrhoea and vomiting is a major problem in child health. Singapore has an annual infant mortality of 440 to 547 due to this syndrome representing 7.1 to 8.6 deaths per 1,000 live births. Thailand loses more than 3,000 children below the age of one from this cause, and Philippines more than 8,000 (W.H.O. 1957, 1958, 1959). The Federation of Malaya shows a mortality of between 400–600 for the corresponding period. Although these figures are striking in themselves, they reflect only a small proportion of the actual morbidity rate. Our estimates from local experience indicate that out of the average annual admission of 500 gastroenteritis cases into the General Hospital, Penang (1961–1963: admissions 2020) there was a 10% fatality (1960–1963: deaths 192). The magnitude of this problem in terms of morbidity and care needed is selfevident.

The long term study is aimed at elucidating the role of bacteria in the etiology of this syndrome. This is not only of academic interest, because, should there be a definable bacterial pattern, then the choice of an appropriate antimicrobial therapy would also become important in addition to the usual supportive measures. In this respect, the (Great Britain) Medical Research Council (1953) pointed out that Chloramphenicol and Sulphadiazine had significant therapeutic benefit in these cases although **Shigella** or **Salmonella** had not been demonstrated in the stools. Further, it is essential to establish what the local conditions are, as in this field of investigation, the reported findings very from region to region.

Material and Methods

All cases of gastroenteritis in the age group studied during the survey period (April 1960 to December 1962) had samples of stools examined on admission. They were either collected without preservative or where some delay was likely, as rectal swabs in glycerol-saline. The latter were then despatched to the laboratory at the earliest opportunity — not later than 24 hours after collection. On arrival they were plated out on MacConkey No. 3 medium, Salmonella — Shigella agar, Desoxycholate Citrate Agar (all "Oxoid" products) and blood agar plates. In addition, Selenite broth and Robertson's cooked meat medium (with added 10% sodium chloride) were inoculated at the same time and incubated overnight, before a subculture was made on further MacConkey and blood plates respectively. All plates were read after overnight incubation and pathogens indentified by standard bacteriological procedures. (Table 1). Where two suspected pathogens were simultaneously isolated, they were reported together.

Results

The results of this work covering a period of nearly three years and involving some 1,700 specimens are seen in Table 2.

Among the generally recognised pathogens, the largest group is formed by the **Shigella** species — 4.9% of the total number of stools examined. Of these Sh. flexner is the most common (Table 3). It is associated with coagulase-positive staphylococci in about a quarter of the cases. A double infection with other pathogens was not found. The pattern of occurence of these organisms suggests an endemic incidence in the population, with occasional exacerbations as at the end of 1962 (see figure).

SALMONELLA as a cause of diarrhoea and vomiting appears to be rare, only three isolations being made during the period under review. Salmonella typhimurium was responsible for one case, a Group C1 salmonella in another and a non-typeable (group A to E4) salmonella in the third.

ESCHERICHIA COLI of previously reported pathogenic sero-types were found in

TABLE 1

Organisms	Preliminary Isolation	Preliminary Identification	Confirmation
Salmonella Shigella	SS agar, DCA or MacConkey No. 3 — direct, and from enrichment media	Kliger Iron agar, Urea agar, Serology	Sugar reactions, Citrate utilisation, Motility Serotyping
Escherichia	Blood agar MacConkey No. 3	Serology	Citrate utilisation, Serotyping Heat test
Pseudomonas	Blood agar	Pigmentation	—
Proteus	Blood agar	Colonial characteristics	Urea agar
Candida	Blood agar	Colonial characteristics	Microscopy
Staphylococci	Blood agar from RCM with 10% NaCl	Colonial characteristics	Coagulase test

Summary of Bacteriological Techniques used in Identification of Organisms in Stools.

TABLE 2

The positive findings in stools of young children with Gastroenteritis.

Year	1960	1961	1962	Total	Per cent
Specimens examined	557	549	597	1703	—
Salmonella	1	2	0	3	0.02
Shigella	16	11	35	62	3.64
+ Staph.	2	8	11	21	1.24
Eschericha	20	12	14	46	2.70
+ Staph.	8	11	11	30	1.76
+ Proteus	2	0	0	2	0.01
Proteus	29	19	17	65	3.82
+ Staph.	14	13	1	28	1.64
Candida	4	1	14	19	1.12
+ Staph.	0	0	1	1	0.01
Pseudomonas	0	1	8	9	0,53
+ Staph.	1	0	5	6	0.35
Staphylococci	306	243	204	653	38.20
Number positive	303	321	321	945	55.04

4.5% of cases. The relative distributions of the serotypes isolated are shown in Table 4. Again, the incidence distribution for the various months of the year (see figure) suggests an endemic occurrence. Whether their presence is of etiologic significance, it is not possible to conclude definitely as the pattern is unlike that in epidemic outbreaks where the circumstantial evidence is strong and suggestive.

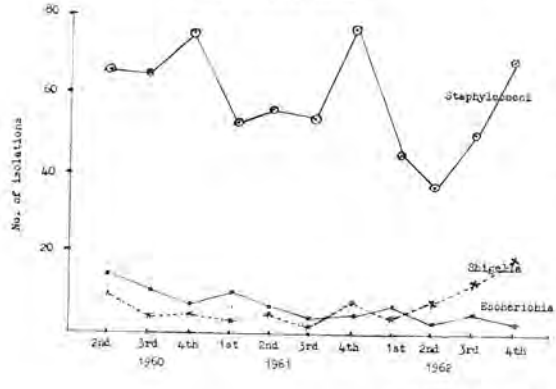
TABLE 4

Serotype	Alone	With Staphylococci	Total	Per cent.
0.119	26	14	40	52.5
0.127	8	6	14	18.4
0.55	7	5	12	15.8
0.26	2	1	3	3.9
0.111	1	1	2	2.6
0.128	1	0	1	1.6
0.126	1	1	2	2.6
0.125	0	2	2	2.6

Frequency of Isolation of Escherichia Serotypes.

An interesting finding is the comparatively large number of cases — 38.2% — where coagulase-positive staphylococci were present as the only suspected pathogen. In another 5% of cases, it is associated with other suspected enteropathogenic bacteria. This problem will be discussed in detail in a following article (Chan and Lucas, 1964).

Seasonal Isolations of Staphylococci, Shigella and Escherichia



The other presumptive pathogens include **Proteus** species — 3.5%; **Candida** — 1.1% and **Pseudomonas Pyocyanea** — 0.9%, in order of their frequency of isolation.

Discussion

Different workers in their examination of stools of young children suffering from gastro-enteritis have incriminated different bacteria. Although there is strong evidence for certain epidemics due to **Salmonella, Shigella** and **Escherichia coli** the findings in different parts of the world in endemic and sporadic cases over an adequately observed period are far from uniform (Taylor, 1960; Ordway, 1960). Part of this discrepancy might be due to choice of investigative techniques or case selection. Moreover, little is known of the pattern in the tropics. Luder (1959) in a report involving two separate series of 100 cases each from Uganda, found an overall incidence of 12.5% **Shigella,** 3.0% **Salmonella** and 1.5% **Escherichia coli.** The majority of his cases had no incriminating pathogen and he suggests parenteral infection and malaria as possible causes. This latter suggestion is difficult to accept on the available data.

SALMONELLA AND SHIGELLA, the commonly recognised entero-pathogenic bacteria, were found in less than 5% of all our cases. Although asymptomatic infection can occur with these organisms (Floyd et al., 1956) and even more so when the frequency of isolation suggests an endemic occurrence as in this study, it has been pointed out by Watt and Hardy (1945) that in the particular age group studied, the ratio of clinical disease to infection by **Shigella** is high. The causal rela-

TRIMESTERS OF THE YEAR

Trimesters of the year	1960 2nd	1960 3rd	1960 4th	1961 1st	1961 2nd	1961 3rd	1961 4th	1962 1st	1962 2nd	1962 3rd	1962 4th
Staphylococci	65	65	76	53	57	55	78	46	38	51	70
Esch. coli	14	11	8	11	7	3	5	7	3	6	3
Shigella	9	4	5	3	5	2	9	4	9	13	20

tionship therefore, appears to be probable. In about 25% of the cases of Shigella infection, coagulase-positive staphylococci were also found. The significance of their relative roles is difficult to assess — it might be that they have a pathogenic synergism or that staphylococcal colonisation in the gut predisposes to clinical Shigella infection.

Specific pathogenic serotypes of **Escherichia coli** have been associated with epidemics of infantile diarrhoea (Hodes, 1956) and their role in these outbreaks has been accepted. However, their part in sporadic and endemic diarrhoea and vomiting cannot be said to be as firmly established. The isolations in our series of particular serotypes have been erratic and no specific epidemiological pattern is present. Although we cannot dismiss them as unimportant, to be unduly enthusiastic about their pathogenic relationship is also unwarranted on the available data. The most frequently isolated serotypes are 0119, 0127 and 055. The total incidence of 4.5% in our series compares with that of the United States but is much lower than other countries. For example, England is reported to have an overall incidence of 20.4%, Poland 36% and France 52.6% (Taylor, 1960).

The rest of the organisms we have presented as presumptive pathogens — because they are not generally recognised as causing diarrhoea and vomiting — form an interesting category as the bacterial growth pattern in these cases presents a striking departure from that of the normal intestinal flora. These organisms are present in such overwhelming numbers that they form an almost pure culture. Epidemics of diarrhoea due to **Pseudomonas aeruginosa** (Hunter and Ensign, 1947) and **Proteus mirabilis** (Pintelon, 1962) have been recorded and thrush enteritis is a feared complication of oral antibiotic therapy. The position, thus, of **proteus, candida** and **Pseudomonas** organisms as reported in this study, has to be considered seriously as one of the possible etiological agents.

TABLE 3

Species	Alone	With Staphylococci	Total	Per cent.
Sh. dysenteriae	1	0	1	1.2
Sh. boyd	1	0	1	1.2
Sh. flexner	51	19	70	84.3
Sh. sonnei	9	2	11	13.3

Frequency of isolation of various shigella species.

In reviewing the comprehensive reports of investigations into the etiology of infantile gastro-enteritis, we are impressed by the large proportion of cases, where the etiology of the syndrome escapes the accepted laboratory methods of investigation for enterobacteria commonly incriminated in gastro-intestinal disease. (Walker et al., 1960, Linetskaya-Novorodskaya, 7959; Taylor, 1960) Neither were viral studies particularly enlightening (Light and Hodes, 1949, Walker et al., 1960). Our experiences with standard techniques have also led to the same conclusion. However, with selective methods, the finding of coagulase-positive staphylococci in about 40% of all cases has suggested a possible role of this organism (Chan and Lucas, 1964), either as a primary casual agent or a predisposing factor for hitherto undetected causes. The problem of this finding is dealt with more fully in a following article.

The concept of "Parenteral" diarrhoea as a distinct entity cannot be accepted without more convincing data, although general debility is no doubt an important contributory factor in production of clinical disease in the infected host (Taylor, 1960).

From the therapeutic point of view, unless there are strong valid objections, it would appear that exhibition of an antibiotic sufficient to meet at least all the suspected bacteria is a rational approach to the management of gastroenteritis in young children. This should be given in conjunction with the usual supportive measures to combat dehydration and acid-base imbalance.

Summary

A bacteriological investigation of the stools of 1703 cases of gastroenteritis revealed the presence of the following: Coagulase-positive staphylococci 38.2%, **Shigella** 4.9%, Pathogenic serotypes **Escherichia coli** 4.5% **Proteus** 5.5%, **candida** 1.1%, Ps. Pyocyanea 0.9% and

Salmonella 0.02%. The role of these organisms is discussed and specific antimicrobial therapy suggested as part of the management of the cases.

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STAPHYLOCOCCI AND INFANTILE GASTRO-ENTERITIS

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Staphylococci have long been known to be able to cause acute gastro-intestinal disease by means of a relatively heat-stable enterotoxin — an entity clinically recognised as staphylococcal food-poisoning (Wilson and Miles, 1946; Dack, 1959). More recently there have been many reports of diarrhoeal disease secondary to the use of wide spectrum antibiotics (Dearing, 1956; Herplan et al, 1953). Fulminating fatal acute pseudomembranous enterocolitis has also been related circumstantially to the presence of large numbers of Staphylococci in the intestine (Palmer, 1959; Dearing and Needham, 1960). Another entity, "staphylococcal enteritis," in which Staphylococci can be isolated in the stools of patients with diarrhoea using selective media which allow for the growth of Staphylococci, has received attention (Cabrera, et al, 1958; Dearing and Needham, 1960; Lancet, 1961).

The high morbidity rate of infantile gastro-enteritis prompted a survey of the stools from patients under the age of two years admitted with diarrhoea and vomiting, for the presence of coagulase-positive Staphylococci in addition to the other recognised enteric pathogens. The period of investigation extended over 30 months (April 1960 to September 1962), and a total of 1533 specimens were examined.

Material and Methods

The stools of all children below 2 years admitted with diarrhoea and vomiting to the Isolation Ward of the Paediatric Unit of the General Hospital, Penang, were sent for routine bacteriological diagnosis. The specimens were either stools collected in 2½ oz. screw-capped bottles or rectal swabs in glycerol-saline. These were dispatched to the laboratory a few hours after collection.

In addition to the other media used for identification of enteric pathogens, i.e., Salmonella, Shigella and Escherichia species, the specimen was also put into Robertson's cooked meat media with added 10% sodium chloride and sub-cultured onto ordinary blood agar the following day. Where a **predominant or pure growth of Staphylococci** was obtained, the organisms were tested by the tube method for coagulase activity and the filter paper method for sensitivity to antibiotics (IMR. Report, 1960).

Gram-stained direct smears were examined in random specimens of stools and the findings were related to the results of subsequent culture. Only where **many** Gram positive micrococci were seen, was the smear scored as "Staphylococci present."

RESULTS

Frequency of Isolation of Coagulase-positive Staphylococci.

During the period of this survey, coagulase-positive Staphylococci were isolated in pure or predominant culture on sub-culture from the cooked meat media in 660 instances. This gives an incidence of 43.0%. In 90 cases (6%), the Staphylococci were found together with other known or presumptive intestinal pathogens (Table 1).

Age incidence.

Staphylococci were apparently found more frequently in cases of diarrhoea between birth and 3 months than in any other subsequent age group (Table 2).

Seasonal Incidence.

There is a tendency to periodicity, with increased frequency of positive isolations during the last trimester of the year (Chan and Lucas, 1964).

Correlation of smear to Cultural findings.

Random smears were examined without foreknowledge of the cultural results. These smears were representative of positive and negative cultures. Micrococci were seen in a

TABLE 1

Years	1960	1961	1962	Total
No. of specimens	557	549	427	1533
Staphylococci alone	199	239	132	570
Staph. with Shigella	2	8	13	23
Staph. with Escherichia	13	11	10	34
Staph. with Proteus	19	10	1	30
Staph. with Pseudomonas	1	0	2	3

Coagulase positive Staphylococci Isolations in Gastro-enteritis.

TABLE 2

Age group (months)	0 – 3	3 – 6	6 – 12	12 – 24	Total
1960	99	40	51	44	234
1961	100	53	68	47	268
1962	64	23	50	21	158

Incidence of Isolated Staphylococci in different Age Groups.

TABLE 3

No. specimens	Culture results	Direct Smear Results Positive	%	Negative	%
129	Positive	67	52.0	62	48.0
203	Negative	39	19.2	164	80.8

Direct Smear Results of Stools for Staphylococci in Gastro-enteritis.

TABLE 4

Antibiotic	No. strains tested	No. Resistant	Per cent.
Penicillin	183	167	91.2
Streptomycin	28	21	75.0
Chloramphenicol	183	108	59.0
Neomycin	28	16	57.1
Bacitracin	28	22	78.6
Tetracycline	154	139	90.2
Oxytetracycline	54	44	81.5
Chlortetracyline	56	8	69.2

Antibiotic Resistant Pattern for Staphylococci Isolated from Stools.

small proportion of smears whose cultures subsequently proved negative for coagulase-positive Staphylococci according to the criteria set. In contrast the stools that were positive for coagulase-positive Staphylococci on culture had a high proportion of positive smears (Table 3).

Sensitivity to Antibiotics

Even though almost all the patients had their specimens sent immediately on admission to hospital and very few had been hospitalised previously, a remarkable finding was the large number of antibiotic resistant strains (Table 4). Over 90% of the isolated strains were resistant to penicillin and tetracycline.

DISCUSSION

Since Koch first demonstrated the presence of micrococci in pus in 1878, the Staphylococcus continues to be a bacteriological problem even in our modern antibiotic era. Its relation to suppurating lesions is well-known, but the fact that it can be associated with diarrhoea following the use of wide-spectrum antibiotics and also its circumstantial association with cases of fatal pseudo-membranous enterocolitis, has alerted workers to the possibility of intestinal Staphylococcal disease existing as a distinct entity. The reason why this problem has not been as fully investigated, is probably due to the failure to recognise the possibility of Gram positive organisms causing diarrhoea, and consequently no great efforts were made to isolate these organisms. A parallel could be drawn from the history of enteropathogenic Escherichia coli which was considered as early as 1927 by Adam to be of etiological significance in infantile gastroenteritis, but had to wait twenty years before they were looked for as causes of outbreaks of diarrhoea in infants (Taylor, 1960). Another important factor lies perhaps in the methodology adopted by most laboratories doing culture of stools for pathogens. Selective media for Gram negative organisms are usually used and Staphylococci can hardly be expected to compete for bacteriological recognition (Cabrera et al. 1958) under such circumstances.

The higher overall incidence of Staphylococci in the intestinal contents of infants is well-known. Martyn (1949 b) found virtually the same incidence of Staphylococci in stools of infants with diarrhoea (44.5%) and controls (46%) and "concluded, therefore, that there is no evidence that Staphylococci bear any causal relationship to infantile diarrhoea and vomiting" (Elek 1959). But later, other workers have pointed out that the presence of a Staphylococcus in faeces — as distinct from predominant or pure growth — is not a criterion for infection. Dearing et al (1953) reported that the presence of resistant strains of Staphylococci in more or less pure culture in the intestinal tract may produce mild or extremely severe gastrointestinal and systemic symptoms and that treatment with a drug to which the organism is sensitive leads to clinical cure (Dearing 1956).

It has been shown (Dearing and Needham, 1960; Cabrera et al, 1958); by the use of appropriate methods, that there is a significant relation between the isolation of Staphylococci and diarrhoea — an entity which is recognised as "Staphylococcal enteritis." Hinton et al. (1960), who did a survey of 826 adults and 346 infants with and without diarrhoea, came to the conclusion that there was a high carrier rate in the stools, especially in those who were exposed to hospital environments. Nevertheless, they concluded that the simple demonstration of a Staphylococcus in the intestinal content of any specific person seems to be "an observation of very limited significance" and a positive culture of a coagulase positive Staphylococcus only means that the patient is in a statistical group in which the disease may occur." On the other hand, the observation that these organisms are found as predominant members of the faecal flora "should be treated with considerable respect." It is perhaps significant to note in their reports, that, a "3+" load of Staphylococci was found in the stools of 5.7% of infants without symptoms compared to 14.1 — 25.1% in those with diarrhoea. The corresponding figures for a "4+" load were 0.0% and 3.0 — 7.8%. In other words Staphylococci were three to five times as commonly isolated in these two groups where there is symptomatic infection. Our positives correspond roughly to their classification of a "3+" or "4+" load.

The difficulty attendant on incrimination of the Staphylococcus as an enteropathogen is the difficulty in the demonstration of a specific biological effect on the intestine of animals. Recognition of an enterotoxin in Staphylococcus contaminated milk and its effect in humans was described by Barber as early as 1914 in the Philippines (quoted by Wilson and Miles, 1946). More recently, Surgalla and Dack (1955) and Prohaska (1959) have demon-

strated the ability of Staphylococci isolated from antibiotic-treated patients and from cases of pseudomembranous enterocolitis to cause intestinal disease in the rhesus monkey and chinchillas, thus demonstrating the enteropathogenicity of the Staphylococcus experimentally. Attempts at typing of isolated Staphylococci with phages have not produced conclusive evidence regarding a specific strain responsible for diarrhoea (Dearing and Needham, 1960; Cabera et al 1958). Sensitivity tests have not helped in this respect either. The antibiotic resistance pattern has not, in our experience, been found to be significantly different from other Staphylococci isolated in routine work. Thus from the diagnostic point of view, there seems to be no readily available in vitro tests to differentiate the enteropathogenic from other coagulase-positive Staphylococci.

From the public health point, it is perhaps necessary to realise the implication of finding antibiotic resistant Staphylococci in the stools of infants with gastro-enteritis. The dangers of faecal contamination of carriers and bed-clothes are no less than those due to Salmonella or Shigella (Greendyke et al., 1958). This is an important consideration in the nursing of such cases. Further, as Dearing et al. (1953) suggest "antibiotic agents should be used only when they are specifically indicated and should not be used promiscuously for treatment of minor illnesses."

It has also been pointed out (Lancet, 1961) that if direct smears show large numbers of Gram positive cocci in clumps, actual intestinal infection with Staphylococcus aureus in highly probable. Our studies have shown that in cases where coagulase-positive Staphylococci were subsequently isolated in large numbers with the use of selective media, there was a significant number of positive smears.

Perhaps an objection to our findings could be that we have used a selective method for the isolation of Staphylococci. But, selective media are used in the identification of other pathogenic enterobacteria. We realise that the present evidence does not signify an invariable causal relationship between the Staphylococcus and infantile gastroenteritis; but the findings are suggestive and point to the necessity for further work on this subject. In the meantime, it is perhaps rational to exhibit appropriate therapeutic measures in the treatment of infantile gastro-enteritis.

Summary

Coagulase-positive **Staphylococci** were isolated in predominant or pure culture, by the use of selective methods, in 43.0% of 1533 cases of infant gastroenteritis. The causal relationship is probable, and specific measures directed against the organism are indicated in the management of these cases.

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THE USE OF HYPNOSIS AS AN ADJUNCT IN SURGERY *

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Prior to the advent of chemoanesthesia in 1846, hypnosis, then known as mesmerism, was popular as a surgical analgesic and anesthetic. The first recorded uses of hypnoanesthesia were in 1821 by Recamier, who performed operations on patients under mesmeric coma (27). Cloquet performed a breast amputation before the French Academy of Medicine in 1829 using mesmerism (18). Between 1840–1850 James Esdaile (11) performed several thousands of operations under hypnosis, of which about 300 were major operations including cataracts, amputations and scrotal tumours. Sampimon and Woodruff (23) described 29 surgical and dental operations successfully performed under hypnosis while in a prisoner-of-war camp in Singapore in River Valley Road during the Japanese Occupation. These dramatic operations under hypnoanesthesia tend to create the impression that this is the only use of hypnosis in surgery. However, the greatest value of hypnosis in surgery is to reduce preoperative medication and chemoanesthesia. There are also other pre- and post-operative advantages. During the past few years many interesting papers have appeared in medical literature reporting the value of hypnosis (4, 7–10, 12, 15, 16, 18, 20, 24, 26, 29).

Our cases are of exploratory nature. We are greatly encouraged by the results, and we hope to do a larger series.

Methodology:

Surgical patients are remarkably good subjects for hypnosis. The patients are hypnotised and conditioned before going for surgery. The whole surgical procedure is explained to the patient at a waking and hypnotic level, so that he expects every step without any surprise and fear. Doubts, fear, apprehension and anxiety are eliminated, and post-hypnotic suggestions of well-being during the post-operative convalescent period are given. The first session, including the time spent for the pre-induction talk, takes about 30–40 minutes. Subsequent sessions take only 10–15 minutes Normally 1–2 sessions are sufficient. It is possible to condition patients in groups to save time. Further sessions during the post-operative period may be required to reinforce the suggestions.

Cases:

CASES 1. A Chinese woman, age 58, was advised elective cholecystectomy. She was a hyperreactive, emotional type of woman. Ten years ago she had a breast abscess incision "under gas" which terrified her very much. The idea of taking out her gall bladder also disturbed her because to the Chinese a person without a gall bladder — no "Tarm" — is a person without courage and is easily frightened and a coward. She was given five hypnotic conditionings. She went to hospital calm and relaxed. No night's sedation and no premedication were given. She had only 75 mgm. of thiopentone for induction and the whole operation was carried till finish with only gas and oxygen. Muscle relaxant used was only 12 mgm. of Di-Allyl-Nor-Toxiferene. Dryness of the mouth, throat and nasal passages had been suggested during the conditioning period, and no atropine was used; the anesthetist was struck by the dryness of the mouth throughout the operation. She had no post-operative pain the whole of the convalescent period except 5–6 hours after the operation, when she complained of epigastric pain (she used to have similar pains before and the long starving before and after operation probably aggravated it). Antacid and milk were ordered and 50 mgm. of pethidine were given at the same time. She was ambulant the day after operation, and asked to be discharged on the second post-operative day. She went home on the third post-operative day. Follow-up of the convalescent period was uneventful.

CASE 2. Another Chinese woman, age 49, was conditioned hypnotically for cholecystectomy. Originally she was investigated in another hospital and found to have gall-stones. The doctor who found her blood pressure raised, did an E.C.G. which showed some

* Paper presented at the Clinical Meeting of the S.M.A. on June 30, 1954.

myocardial ischemia, and hinted to her the possible risk; and she turned down the operation. She heard about the successful operation on the first case through a friend, and she decided to use hypnosis to help her in her operation. Going into her history it was learnt that she had a series of unfortunate events in her life, which made her a very nervous woman, always suffering from headaches, palpitations and insomnia. About 10 years ago her husband's business failed. Then, not long after she was badly scalded and nearly lost her life; she was hospitalised for three months. Soon after discharge from hospital, she was involved in a car accident — the bus in which she was travelling up country overturned. Though only bruised, she was very much frightened. Six months later her father died, followed soon by her mother. When she was first examined, she had a B.P. of 180/110, she was nervous and had palpitations and insomnia. She had a total of four hypnotic conditionings, and before she went for surgery the B.P. had come down to 120/80, she had no palpitations and slept well in hospital before and after surgery. No premedication was given. On the table she was hypnotised, 10 mg. of Di-Allyl-Nor-Toxiferene were given, the endotracheal tube was passed and the anesthesia was maintained with gas and oxygen. No other drugs were given during the operation. After the operation she had only 25 mgms. of pethedine. There was no vomiting or other complication, and she was ambulant the day after operation.

CASE 3. A married Chinese woman, age 28, was admitted to hospital with a toxic goitre for elective thyroidectomy. She underwent a subtotal thyroidectomy under hypnoanesthesia alone. This is believed to be the first case reported in South-East Asia. She had a diffuse swelling of her thyroid for the past two years. She was a hyperactive woman, and in spite of much sedation with phenobarbitone and amylobarbitone she was still unable sleep. Her sleeping pulse was 100–120. She was given a total of seven hypnotic conditionings and was able to enter a somnambulistic trance. After hypnosis was started, although all sedation was withdrawn, she was able to sleep though her sleeping pulse remained the same. On the morning of operation she was taken to the operating room very calm and relaxed. The entire procedure, the removal of both sides of the thyroid which extended far back into the neck, was performed without discomfort except for the period of traction on the trachea when she groaned a bit. The entire operation took 70 minutes. Immediately after surgery she was able to sit up, talked and walked down from the operating table to the wheel chair. She made an uneventful recovery, and required no analgesic drugs during the post-operative period. A few days after the operation she complained of itchiness of the scar wound. The hypnotic session stopped the itch for her.

CASE 4. A 28-year old Chinese School teacher had a thyroid adenoma. He was given only one session the evening before the operation. No sedation for the night and no premedication were given. 100 mgm. thiopentone were used for induction, and 10 mgm. of muscle relaxant were given. Only gas and oxygen were used to maintain the anesthesia. His mouth was dry throughout the operation. After operation he had no pain and did not require any analgesic. He was not confined to bed the same evening of the operation.

CASE 5. A 57-year old Chinese business man was given only one hypnotic session for elective cholecystectomy. He had only 100 mgm. thiopentone for induction, 8 mgm. of muscle relaxant, and gas and oxygen for maintenance of anesthesia. A few hours after the operation he complained of a pain in his back and gr. 1/6 omnopon was given. The same evening he was ambulant, and no further analgesics were required. His backache continued to trouble him during the post-operative period and the surgeon had to give him local infiltration into his spinal muscles.

CASE 6. A 45-year old Chinese clerk underwent cholecystectomy with only one hypnotic conditioning. He had 150 mgm. thiopentone for induction and 10 mgm. of muscle relaxant, and gas and oxygen for maintenance of anesthesia. His mouth was dry throughout the operation. He was found to have a perforated gall bladder with mucoid fluid loculated in Morrison's Pouch, and there were multiple faceted stones. After the operation he was given blood transfusion, and intravenous glucose and saline for several days. No analgesics were required during the whole of the convalescent period.

CASE 7. A 55-year old clerk had only one hypnotic conditioning the evening before operation and a 10-minute session the following morning. He underwent a partial gastrectomy for a large growth of the pyloric end of the stomach spreading to the head of the pancreas. The stomach was dilated and there was ascites. Only 100 mgm. thiopentone and 10 mgm. of muscle relaxant were used and gas and oxygen for maintenance of anesthesia. After operation he had only a single injection of gr. 1/3 omnopon. When all the drips and nasal tube were removed, he was very cheerful, comfortable and ambulant. He went home on the 7th post-operative day.

CASE 8. A 37-year old Chinese housewife had an excision of a dilated thyroid adenoma. She had only one hypnotic conditioning. That night before the operation she slept very well. 125 mgm. thiopentone and 10 mgm. of muscle relaxant were used, and gas and oxygen for maintenance of anesthesia. Her mouth was very dry throughout the operation. For two successive nights after the operation she was unable to sleep. She had no pain at the site of the operation, but she had a severe ache at the back of her neck — probably due to prolonged hyperextension of her neck during operation. On the first night after the operation, the sister on duty who found her awake late at night, thinking that she could not sleep because of pain gave her gr. 1/3 omnopon, which did not help her very much in her sleep. The second night barbiturates did not help her. She was asked whether she had any dream or heard anything during the operation. She could vaguely recall a dream during the operation that she had cancer of her thyroid and that she was very ill. However, she said even though it was cancer, she was not afraid because to die was fated. But she could not understand why she could not sleep. The patient was re-hypnotised, reassured that it was not cancer and was told that what she dreamt or heard was not true. It was later learnt that the operating team who found the nodular fibrotic appearance of her thyroid did discuss about the possibility of carcinoma during the operation.

CASE 9. A 51-year old Chinese business man underwent a left ureterolithotomy. He was given only one hypnotic conditioning the evening before surgery. 200 mgm. thiopentone and 10 mgm. of muscle relaxant were used and gas and oxygen for the maintenance of anesthesia. When he came round in the ward and was presented with the stone, he was very disappointed to find the stone so small that he thought it could have been passed out by taking some Chinese herbs which he used to give to his friends for ureteric stones because he was a "Koon-tow" man. That evening after the operation he had to be given gr. 1/3 omnopon. Only after the next morning when the surgeon told him that his stone had been impacted in the ureter for more than a year was he satisfied. He required no further analgesic after that and was able to move about.

CASE 10. A 41-year old Government Executive Officer had severe phimosis, and was advised circumcision. He was given five hypnotic conditionings because we wanted to do the circumcision under hypnoanesthesia alone as an out-patient. He experienced no discomfort throughout the entire operation which was not an easy one, and it took 20 minutes because of many adhesions. After the operation he was able to walk home.

CASE 11. A 67-year old Chinese underwent Millin's Prostatectomy and Cystolithotomy. He had two hypnotic conditionings before operation. 200 mgm. thiopentone and 12 mgm. of muscle relaxant were used, and gas and oxygen for maintenance of anesthesia. After the operation he required only gr. 1/6 omnopon. He was able to get out of bed on the second postoperative day with the catheter still in.

CASE 12. A 12-year old boy had a severe pain in the R.I.F. the whole afternoon after coming home from a swim. He was brought to hospital and operated on for appendicitis at 8 p.m. He had only a short session of hypnotic conditioning. The hypnotist stayed with him during the whole operation. He was hypnotised on the table and only gas and oxygen were used for anesthesia, and suxamethonium for muscle relaxation. When he came round after the operation and returned to the ward, he was quite comfortable though later in the night he had to be given 50 mgm. pethidine injection before he could sleep. The

next morning he was able to get out of bed. His postoperative recovery was excellent.

CASE 13. A 24-year old seamstress underwent an appendicetomy. She had only one hypnotic conditioning before operation. 150 mgm. thiopentone were used for induction, and gas and oxygen for anesthesia, atropine and suxamethonium were also used. That night after operation she had to be given 100 mgm. of pethidine injection before she could sleep. Next morning she was able to walk to the lavatory.

CASE 14. A 22-year old Chinese salesman underwent excision of a thrombosed external pile. He had only one hypnotic conditioning. He was given 250 mgm. thiopentone for induction, gas and oxygen for anesthesia, and suxamethonium as relaxant. After the operation he felt no pain. After 48 hours he pulled out the anal pack himself and was able to defecate after that. No analgesic was given during the convalescent period.

RESULTS:

Operation.	Age.	Sex.	Night's Sedation.	Premedicat.	Induction	Maint.	Pain-relieving drugs Pethidine or Omnopon Injections.
Hypnosis Used							
Cholecystectomy	58	F	Nil	Nil	Thiop. 75	G/O	1x 50 mgm.
Cholecystectomy	49	F	Nil	Nil	Nil	G/O	1x 25 mgm.
Partial Thyroidectomy	28	F	Nil	Nil	Nil	Nil	Nil
Excision-Thyroid Adenoma	28	M	Nil	Nil	Thiop. 100	G/O	Nil
Cholecystectomy	57	M	Nil	Nil	Thiop. 150	G/O	Nil
Cholecystectomy Perforated G-B	45	M	Nil	Nil	Thiop. 150	G/O	Nil
Partial Gastrectomy	55	M	Nil	Nil	Thiop. 100	G/O	1x Gr. 1/3.
Bilateral Excision of Thyroid Adenema	37	F	Nil	Nil	Thiop. 125	G/O	Nil
Left Ureterolithotomy	51	M	Nil	Nil	Thiop. 200	G/O	1x Gr. 1/3.
Circumcision	41	M	Nil	Nil	Nil	Nil	Nil
Millin's Prostatectomy & Cystolithotomy	57	M	Nil	Nil	Thiop. 150	G/O	1x Gr. 1/6.
Appendicetomy	12	M	Nil	Nil	Nil	G/O	1x 50 mgm.
Appendicetomy	24	F	Nil	Nil	Thiop. 150	G/O	1x 100 mgm.
Excision of Thrombosed External Pile	22	M	Nil	Nil	Thiop. 250	G/O	Nil
Hypnosis Not Used							
Cholecystectomy Perforated G-B	24	F	Emergency	Atrop. 1/100	Thiop. 250	G/O	6x 100 mgm.
Cholecystectomy	53	F	teep 2	Atrop. 1/100 +Vallergan 25	Thiop. 200	G/O	3x 100 mgm.
Cholecystectomy	57	F	teep 2	+Vallergan 25	Thiop. 175	G/O	5x 100 mgm.
Partial Thyroidectomy	54	F	teep 2	+Vallergan 25	Thiop. 250	G/O	3x Gr. 1/6.
Partial Thyroidectomy	39	F	teep 2	+Vallergan 25	Thiop. 200	G/O	2x 100 mgm.
Excision-Thyroid Adenoma	36	F	teep 2	+Vallergan 25	Thiop. 250	G/O	2x 100 mgm.
Partial Gastrectomy & Cholecystolithotomy	62	M	Emergency	Atrop. 1/100	Thiop. 100	G/O	5x Gr. 1/3.
Laparotomy-Gastrostomy	62	F	Nil	Atrop. 1/100	Thiop. 75	G/O	8x Gr. 1/6.
Partial Gastrectomy	41	M	teep 2	Atrop. 1/100 +Vallergan 25	Thiop. 200	G/O	3x Gr. 1/3.
Right Ureterolithotomy	58	F	teep 2	+Vallergan 25	Thiop. 200	G/O	3x Gr. 1/3.
Appendicetomy	37	M	Emergency	Atrop. 1/100	Thiop. 250	G/O	3x 100 mgm.
Appendicetomy	28	M	Emergency	Atrop. 1/100	Thiop. 250	G/O	4x 100 mgm.
Millin's Prostatectomy	60	M	teep 3	Atrop. 1/100 +Vallergan 25	Thiop. 250	G/O	7x Gr. 1/3.

The above is a summary of the results. The results are compared with a group of untreated controls selected at random and undergoing almost the same operations by the same group of surgeons. A clinical evaluation of the value of hypnosis in surgery is not easy. It is difficult to evaluate the benefits derived by each patient because of the sub-

jective nature of pain. Subjectively hypnosis seems to create hope and confidence in the surgical patients, irrational fears are neutralised and postoperative well-being and relative comfort ensured. An objective evaluation of hypnosis in surgery is difficult and can only be presented on an empirical basis. In our hypnotic series none of the patients received any night's sedation and premedication, and they were none the worse, and in fact their induction, anesthesia and postoperative convalescence were better than the non-hypnotic group. The amount of thiopentone used for induction is considerably reduced, and in two of the cases thiopentone was not used at all — only hypnosis was used for induction. The most remarkable result derived from the use of hypnosis is the marked reduction in the need of narcotics during the postoperative period. Several of our patients in the hypnotic group did not require any pain-relieving drugs at all. The rest needed only one single dose, and they were quite comfortable postoperatively. The advantage of this is obvious since it is well-known that narcotic agents reduce the physiologic efficiency of organs such as the kidneys, lungs, etc., and have other adverse effects on normal peristalsis causing abdominal distension, bladder function causing urinary retention, respiration, late ambulation and slow recovery. There were no vomiting or other complications in the hypnotic series, and all the patients felt they were greatly benefited by using hypnosis. No pretense is made as to the statistical significance of this small number of cases. They are presented merely in the hope that they may stimulate further and more extensive study.

Discussion:

Strong evidence exists that suggestion plays an important role in the recovery of surgical patients after uncomplicated procedures (2, 3, 4, 16, 25 & 28). Beecher (1) feels that the enthusiasm or skepticism of a surgeon may influence the therapeutic result of an operation. Wolff and his associates (3, 28) have shown that neural activity, even at a high cortical level, can alter the reactions of the peripheral tissues to noxious stimuli with threatening suggestion augmenting damage, in response to suggestion in hypnosis. Even as far back as 1877 Delboeuf in France (16) wondered why people in stage demonstrations, who had tissue injury, seemed to heal so rapidly. He got volunteers, hypnotised them, anesthetised one arm and left the other arm sensitive. He found that when he burned them as nearly equally as he could, the anesthetised arm did not develop a blister. It healed much more rapidly than the other. He crossed this over, repeated the tests, and anesthetised the other arm just to check his results. He found the same results. In 1959 Harold Wolff and his co-workers, Helen Goodell and Loring Chapman, at Cornell University, repeated Delboeuf's experiment, apparently without knowing about his work. They found there was a marked difference between the tissue reactions, edema, redness, and swelling of injured tissues when one arm was anesthetised with hypnosis and the other arm left sensitive. They gave the suggestion to these hypnotised subjects that the unanesthetised arm was going to have something dreadful happen to it. They increased the anticipation of something happening to the tissues, and they found that the responses were greater, with more swelling, more blister formation (2).

Hypnosis is of use in surgery in the following ways:—

1. Hypnosis in Pre-operative Sedation
2. Hypnosis as an Induction to General Anesthesia
3. Hypnosis as an Anesthetic
4. Hypnosis in Post-operative Therapy.

Hypnosis in Pre-operative Sedation:

Hypnosis is a valuable weapon in preoperative sedation. The prospective surgical patient is usually frightened, he anxiously anticipates pain, possible morbidity, and even mortality. In its evolution surgical science has neglected the personality as a factor of surgical success. Actually recovery from surgery depends on the patient's ability to restore his own homeostasis and heal his own wounds. Psychic factors have been long recognised important factors in medical and surgical healing. The emotional response of the patient to anxious fear or confident hope can profoundly influence the nature and duration of his post-operative convalescence. Fear inhibits and hope speeds recovery. Under

hypnosis confident hope can be created, irrational fear neutralised, and thus post-operative comfort and early recovery ensured. The conditioned surgical patient goes to surgery calm and relaxed. He sleeps well the night before surgery. Often he does not require any premedication, and reaches the stage of surgical anesthesia with the minimal amount of anesthetic drugs.

Hypnosis as an Induction to General Anesthesia:

As an induction to general anesthesia hypnosis compares favourably in efficiency to thiopentone, but it is free from the dangers of that quick acting narcotic, with its depressive effects on the respiratory centre, its tendency to cause laryngeal spasm, and other vagotonic effects, and the easy liability to over-dosage in the very ill or "poor risk."

Hypnosis as an Anesthetic:

Chemoanesthesia, so easy to administer and so effective, is the method of choice over pure hypnoanesthesia for surgery. However, hypnoanesthesia, unlike chemoanesthesia, is in every respect harmless to the patient. It has all the prerequisites of the ideal anesthetic (17). J. B. DeLee, the father of obstetrics, once stated that "the only anesthetic that is without danger is hypnotism" (6). Despite its effectiveness in major surgery, hypnosis will never be a substitute for chemoanesthesia since it can be utilised in less than 10% of the cases and these must be very carefully selected. Hypnosis, in combination with anesthesia can be employed routinely for the poor surgical risk as well as for the debilitated and geriatric patient undergoing major surgery. We do not advocate hypnoanesthesia in cases where the patient is able to take chemoanesthesia (14).

Hypnosis in Post-operative Therapy:

Post-operatively hypnosis is of inestimable value when it is used in suitable patients. The surgical patient conditioned before surgery enjoys comparative post-operative comfort and early recovery. Further hypnotic sessions during the post-operative period may be required to reinforce the suggestions. Deberneck (7) utilised hypnosis as a pre- and post-operative adjunct in the treatment of surgical cases, including the post-gastrectomy or "dumping" syndrome, post-operative pain and various bizarre forms of pains. Wangensteen and his Associates (8) used hypnosis to prevent post-operative urinary retention.

Conclusion:

Hypnosis when judiciously used is of inestimable value in surgery. A number of cases is presented to show the value of hypnosis in surgery.

ACKNOWLEDGEMENT

We are grateful to Reverend Mother, Mount Alvernia Hospital, Singapore, for giving us permission to use hypnosis in the Hospital.

I am grateful to the Surgeons: Prof. G. S. Yeoh, M.B.B.Ch., F.R.C.S., F.R.A.S., F.A.C.S., Mr. K. S. Yeoh, F.R.C.S., F.R.C.S.E., and Mr. E. M. T. Lu, F.R.C.S., F.R.C.S.E. of the Yeoh Clinic for providing me the cases for this study. I must also thank the Anaesthetist, Dr. George Tay, M.B.B.S., F.F.A.R.C.S., F.F.A.R.C.S.(I), also of the Yeoh Clinic for his kind co-operation and assistance.

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MALAYAN MEDICAL ASSOCIATION

ETHICAL CIRCULAR

A member of the Association wrote to the Ethical Committee requesting guidance on the extent to which medical details of an employee should be revealed to his employer. It was stated that some practitioners record entire details of illness, investigations and treatment on medical record cards which are filed with the employer and not with the doctor. Employers are now exerting pressure on their medical retainers to supply them with details of medical information and in support of this quote certain private practitioners and some practitioners in Government service who have little hesitation in supplying medical details.

The Ethical Committee wishes to remind members of the Malayan Medical Association of the following sections of our Ethical Code:—

Para. 2 of Section 2 reads "It is a practitioner's obligation to observe strictly the rule of professional secrecy by refraining from disclosing voluntarily without the consent of the patient (save with statutory sanction) to any third party information which he has learnt in his professional relationship with the patient."

Section 4 para. 40 reads "The personal medical records of employees maintained by an industrial medical officer for his professional use are confidential documents. Access to them must not be allowed to any other person except with the consent of the industrial medical officer or with the consent of the employee concerned."

Our Ethical rules clearly state that all medical record cards are privileged documents and their contents should only be revealed to another doctor, or to a third party after obtaining consent of the patient. If a firm insists it should keep the medical records of its employees then the firm's medical practitioner should record on these cards information limited to the name and other personal particulars (address, age, sex, etc.), the dates of attendances and the number of days medical leave granted. The cards should neither contain the patient's symptoms, signs, results of any investigations carried out and diagnosis, nor the treatment prescribed. The practitioner should have his own private record cards for each and every employee who is his patient. These should be his own private documents and will necessarily contain all details of medical examinations, investigations, diagnosis and treatment. Any information of a confidential nature should only be revealed to the employer with the written consent of the patient. The advantages of this practice are obvious for not only in the long run will medical practitioners help to maintain a sound doctor-patient relationship but also absolve themselves from any future litigation which may result from disclosure of medical details of an employee to his employer.

The Ethical Committee feels that if all medical practitioners (whether in private practice or Government Service) explained to employers that it is against medical ethics to reveal details of medical examinations to a third party this unhealthy practice would cease.

Dr. KESHMAHINDER SINGH,
Hon. General Secretary,
Malayan Medical Association.

COMMONWEALTH MEDICAL ASSOCIATION

COMMONWEALTH NEWSLETTER No. 5

London Meeting of Council

1. This Commonwealth Newsletter (number 5) follows a most successful meeting of the Council of the Commonwealth Medical Association in London. Enclosed is a copy of the report of the Meeting which appeared in the British Medical Journal. The formal Minutes of the Council will be issued in due course. In the meantime, however, the Council thought that it would be useful to let member Associations know of some of the decisions taken at the meeting which will effect the future conduct of the affairs of the Commonwealth Medical Association.

Membership

2. The Council decided that applications from other Associations within the Commonwealth to join the Commonwealth Medical Association should be dealt with only by the Council in session and in accordance with the following principles:—

(i) An association which applies for membership will be invited by the Honorary Secretary-Treasurer to complete and return a questionnaire, designed to elicit basic information about the applicant association which will be laid before the Council when its application is considered.

(ii) Only one association in each country will be eligible for election to membership; but in a country where a single (or clearly predominant) national association has not yet evolved, observers from more than one association may be permitted to attend the Council without charge to the funds of the Commonwealth Medical Association.

(iii) Only fully registered medical practitioners will be permitted to attend the Council, either as delegates or observers; or to enjoy any other privileges of C.M.A. membership.

3. On the instructions of the Council, a letter reporting the proceedings of the London meeting and indicating the procedure for making application for membership of the Associa-

tion has been sent for information to the non-member medical associations of independent territories within the Commonwealth.

Finance

4. The Council decided to continue the present method of financing the Commonwealth Medical Association by means of the "London formula" with an annual subscription of at least £50. This involves a slight change inasmuch as the subscription is payable whether or not the member Association sends a delegate to meetings of the Council. Previously the minimum subscription was £100 per meeting attended. In order to improve the finances of the Association the Council also expressed the hope that those member Associations which now pay the minimum subscription of £100 **per meeting** may find it possible voluntarily to increase their contributions, beyond the minimum figure of £50 p.a.

The Newsletter

5. At the Council meeting it was reported that there had been some difficulty in obtaining news items for the Commonwealth Newsletters from the member associations. Four Newsletters had so far been issued and it had, unfortunately, proved necessary to fill them largely with news from the United Kingdom. The Council felt that in some of the member countries the Commonwealth Medical Association was not sufficiently well-known. The Constitution of the Association (Article 9) envisaged the establishment of a local organisation in each country and the Council hopes that this aim will at once be fulfilled by each member Association. As a first step, it hopes that the Secretary of each member association will agree to act as local correspondent for the Newsletter and will keep the editor of the Newsletter regularly supplied with information about his own country.

6. The editorship of the Newsletter will, in future, pass inrotation among member Associations and the Newsletter will be issued by the medical association of the country which will act as host to the next Council meeting. This means that Dr. R. B. Khambatta of the Pakistan Medical Association will act as editor until 1966 and members of the Association are asked to send him all items for inclusion in forthcoming editions of the Newsletter. His address is 3, Hotel Metropole Building, Karachi, 17.

Future Meetings

7. The next meeting of the Council is to take place at the invitation of the Pakistan Medical Association in Karachi on 26th – 29th November, 1966. It will follow the third World Conference on Medical Education in New Delhi and will precede the Joint Meeting of the British and Pakistan Medical Associations which is to take place in Karachi from 30th November to 3rd December, 1966.

8. The Council has also provisionally accepted an invitation from the Australian Medical Association to meet in Australia in 1968. Here again, the World Medical Association is expected to hold its General Assembly in Australia that year and there will also be a joint meeting of the Australian and British Medical Associations in Australia in 1968.

Canadian Medical Association

9. The inaugural meeting of the Council of the Commonwealth Medical Association at Colombo in November, 1962 resolved: "That the Canadian Medical Association be cordially invited to join the Commonwealth medical Association." It is a great pleasure to be able to announce that, after receiving a report from its observers who attended the London meeting of the Council, the Canadian Medical Association has now accepted this invitation. The letter of acceptance from Dr. Kelly was couched in particularly warm terms.

October, 1964.

THE BEST BOOK ON LEPROSY *

In 1959 Dr. R. G. Cochrane produced a text book on leprosy which was so well accepted that within three years it was sold out. The second edition is now available, considerably enlarged (659 pages) and with an additional editor Dr. T. F. Davey who has vast experience in Africa. The new book also calls on no less than 43 other experts as contributors including such great names as Paul Brand the Professor of Orthopaedic Surgery in Vellore, Dr. V. R. Khanolkar Professor in Medicine at the Indian Cancer Research Centre Bombay, Professor O.K. Skinsnes of Chicago, Dr. S. G. Browne of the Leprosy Service Research Unit in Nigeria and Dr. A. G. M. Weddell, Reader in Human Anatomy in Oxford. It is obvious that the editors have done their best to accumulate the most authoritative experience possible throughout the world although it must be admitted that the absence of any contributors from South America is a little surprising.

The book consists of 33 chapters and a number of appendixes and attempts to cover the whole of the theory and practice of leprosy. Authoritative chapters to begin with include "The Submicroscopical Structure of the Mycobacterium Leprae." "Recent Investigations into the Sensory and Neurohistological Changes in Leprosy" and "Leprosy and the Schwann Cell *in vivo* and *in vitro*." These are all written by acknowledged experts in their fields while Skinsnes' chapters on Immunology and the one on Genetics are both fine examples of the assistance which an outside discipline can bring to the subject.

It is obvious that the editors gave a wide play to individual authors, for example the article on Pathology would not be accepted in many centres as being completely accurate while Lumsden's contribution on the Schwann cell directly challenges statements made in Weddell's article. Unfortunately chapters on "reactions" and their treatment are by different authors who do not seem to see eye to eye on matters of basic definition and there is an obvious divergence of opinion as to the diagnosis and even the existence of the Progressive Lepra Reaction. These and other examples of editorial permissiveness must surely make it difficult for the non-specialist who is reading the book to understand fully where the truth is believed to lie and it would probably have been of more use if the editors came out more definitely in favour of one particular view even if this was not completely accepted by all authorities who are studying the disease.

General practitioners and surgeons who have bought the book as an aid to their practical treatment of their patients will heave a sigh of relief when, on page 251, Signs and Symptoms are at last mentioned. Such readers will certainly be full of admiration for the frequent brilliance of the foregoing articles but may perhaps wonder whether a simpler book would not be better for their own purposes. All surgeons working in countries where leprosy is common will admire Paul Brand's article on Deformity but even here phrases like "acute lepromatous reaction" are difficult to interpret from the context and one wonders what other authors would have called this condition. The whole group of articles on surgery and physiotherapy is quite first rate and it would be a pity if any surgeon was deterred from acquiring this book because of lack of interest in the theoretical side of the disease.

The index is occasionally erratic. For example references to the Ziehl-Neelsen's method of staining leprosy bacilli are not of any use at all as aids to staining while the detailed instructions on page 614 are not mentioned in the index. To sum up there is an enormous amount of valuable material in this book which is both heavy and expensive and it is suggested that further editions of the same type would rather defeat their own ends which is surely to promote an up-to-date knowledge of leprosy.

If this book had been published in 3 smaller volumes entitled:—

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* Leprosy in Theory and Practice. Editor R. G. Cochrane. assit. by T. F. Davey. 672 pp. 10 x 6½ in. 247 illus. Price £5 15s. 0d. Publisher John Wright & Son Ltd. Bristol.

(1) Leprosy for the physician
(2) Leprosy for the surgeon and
(3) Recent advances in leprosy

it would probably have reached an even wider audience than it will in any case command.

JOHN H. S. PETTIT.

THE NUTRITION SOCIETY

A meeting of the Nutrition Society will be held on Saturday, 5th December, 1964, at the Royal Veterinary College, London. It will be for the presentation of original communications.

DATIN LADY THOMSON, M.R.C.S., L.R.C.P.,
Hon. Overseas Correspondent in Malaya,
Institute for Medical Research,
Kuala Lumpur.

THE NUTRITION SOCIETY

FORTHCOMING MEETINGS

Friday, February 19, 1965

A meeting for the presentation of original communications will be held in Ayr, Scotland.

Instructions to those intending to submit papers are the same as those given for the meeting on December 5, 1964*, titles and abstracts should however be sent to Dr. C. F. Mills, Rowett Research Institute, Bucksburn, Aberdeen, by December 31, 1964.

Fourth International Congress of Dietetics

The Fourth International Congress of Dietetics will be held in Stockholm, Sweden, from July 12th to 16th, 1965. The theme of the Congress will be "New Horizons in Dietetics."

A limited number of short original communications will be accepted on the following subjects.

A. Overnutrition.
B. Nutrition and food technology.
C. Management and large scale catering.
D. New therapeutic diets.

Abstracts of original communications in English or French not exceeding 400 words must be received by the end of October, 1964.

* See notice in last issue

Enquiries regarding the Scientific Programme should be addressed to:—

the **Programme Planning Committee**
Svenska Ekonomi forestandarinnors Forening
Kungsgatan 54v
Stockholm C
Sweden.

DATIN LADY THOMSON, M.R.C.S., L.R.C.P.,
Hon. Overseas Correspondent in Malaya,
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NOTICES

The Fifth Annual General Meeting of the Malayan Medical Association will be held in Ipoh, April 16th - 18th, 1965. All members are asked to attend this meeting. Papers for the scientific meeting are invited. Further information will be circularised, please keep these dates free so that you may attend.