

# IMPLICATIONS OF THE SPECIALITY OF OBSTETRICS AND GYNAECOLOGY

## 2. Maternal Mortality

BY

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Maternal, foetal and neo-natal mortality may be taken as indices of the efficiency of an Obstetric Service.

It was the high maternal mortality noticed in the earlier years of this century that made obstetricians halt and take stock. A comprehensive report, brought out by the Ministry of Health, England, in 1937, showed that 8% of the total deaths from all causes, among women of child-bearing age, were due to complications of pregnancy and childbirth. Taking age groups, puerperal deaths were 12th on the list from 15 years upwards, but they were 3rd on the list in the age group 15-25 and 2nd on the list between 25-35 years.

Blair Bell asserted that for every

puerperal death twenty suffered impaired health and lowered efficiency.

Puerperal sepsis was the biggest problem. With the development of proper preparation in the ante-natal period, strict asepsis during labour and early isolation of suspected cases, sepsis, as a cause of puerperal mortality and morbidity, has definitely taken a minor place.

In 1928, an investigation was started in England by a Departmental Committee appointed to go into the causes of maternal deaths and a very illuminating report was brought out. Investigations on similar lines were carried out in India, at Madras, Calcutta and Bombay. The findings are summarised as:—

	England (1932)	Madras (1933)	Calcutta (1936-37)	Bombay (1937-38)
Puerperal sepsis .. ..	36.3 %	30.9 %	32.0 %	39.1 %
Abortions & ectopics .. ..	15.2 %	10.3 %	6.2 %	5.9 %
Puerperal hmgs. .. ..	14.8 %	14.8 %	10.6 %	9.4 %
Eclampsia & toxæmias .. ..	16.4 %	21.5 %	20.1 %	12.4 %
Shock & embolism .. ..	17.2 %	8.9 %	5.3 %	12.1 %
Anaemia .. ..		13.4 %	23.5 %	17.1 %
Acute yellow atrophy .. ..		0.3 %		2.9 %

Series of lectures delivered at the Maharaja Sayajirao University of Baroda in June 1954.

The aetiology is divided into (a) those the direct result of pregnancy, labour or puerperium, and (b) diseases associated with or aggravated



by the pregnant state. These latter are general diseases not necessarily peculiar to pregnancy, but are apt to take a formidable turn in the pregnant state. The Departmental Committee estimated that associated diseases accounted for 20% of the deaths. The enquiry in Bombay revealed that 34% of the deaths were due to associated diseases. The commonest ones are diseases of the heart, particularly valvular disease, diseases of the lungs, mainly tuberculosis, chronic nephritis and various infectious diseases, of which smallpox and enteric fever being common epidemics, take a high toll. Infective hepatitis has been known to occur in epidemic form during the last few years, and the mortality amongst pregnant and parturient women has been seen to be very high. Acute yellow atrophy is possible in the non-pregnant individual, but shows such a predilection for the pregnant state that it may be classified along with specific causes of maternal mortality. Anaemia is another of these general affections, which takes an alarming turn during pregnancy. This is a very infrequent complication of pregnancy in the West, but has a high incidence in our country. In fact, figures of maternal mortality within recent years in India show anaemia as the most frequent single cause of death. Most of these cases of anaemia seem to be of nutritional origin and are thus largely preventable. The tragedy is thus all the greater. These cases are often described as "anaemia of pregnancy", implying that the pregnant state was responsible for its development, just as toxæmia may develop. The late Dr. M. I. Balfour was perhaps the

first one in India to draw attention to this anaemia as a formidable complication of pregnancy. She arranged for Dr. Lucy Wills to come out and work on the problem. Dr. Wills, as a result of her investigations, pointed out the preponderance of macrocytic, often megaloblastic, anaemia associated with the presence of free hydrochloric acid in the gastric juice, this anaemia thus differing from pernicious anaemia. Parenteral liver therapy had been introduced just about the time Dr. Wills started her work in India. She found that these cases of pregnancy anaemia responded better to crude liver extract rather than to the refined product. She experimented on the effects of dialysed marmite, a rich source of vitamin B complex, and was encouraged by the response made in many of the cases. Work has been carried out since at various centres, particularly at Bombay, Calcutta and Madras. The discovery of folic acid and later of B12 has almost revolutionised the treatment, but to be effective, the cases must be seen early enough, and particularly ere the cardiac muscle has degenerated. Microcytic hypochromic anaemia is also very common in pregnancy. A third type, often encountered, is due to protein deficiency. All the three types are probably manifestations of nutritional deficiencies.

The International Classification of Diseases gives a very detailed list for tabulating maternal deaths. We may conveniently classify these specific causes under a few broad groups:

1. Infections — puerperal and post-abortal
2. Abortion haemorrhages, vesi-



- cular mole and ectopic gestation
3. Puerperal haemorrhages
    - (a) ante-partum
    - (b) post-partum
  4. Toxaemias
    - (a) Hyperemesis gravidarum
    - (b) Eclamptic toxæmia
    - (c) Nephritic toxæmia and hypertension
    - (d) Acute yellow atrophy
  5. Accidents of labour
    - (a) Difficult labour, due to disproportion, malpresentation or foetal abnormality
    - (b) Rupture of uterus
    - (c) Acute inversion of uterus
  6. Sudden death
    - (a) Shock
    - (b) Embolism

To take each of these seriatim:

#### 1. Infections

As I have already mentioned the incidence of this has been reduced considerably, so that *puerperal sepsis*, having been accountable for nearly a third of the total maternal deaths, hardly claims any deaths at present at well-organised centres. Unfortunately, we still see a high percentage of deaths from sepsis in cases attended by untrained attendants. In the investigation carried out by me in 1937-38, this incidence was 43.6% of the deaths under sepsis, although barely 25% of the total deliveries were conducted by untrained attendants. The proportionate incidence will be still higher in the present day, since infection in institutions has been well controlled. The types of sepsis which prove fatal are acute septicaemia, pyaemia,

general peritonitis, and thrombophlebitis. The outcome depends largely on the organisms involved and their sensitivity to chemotherapy and antibiotics. Some cases of infection by anaerobic organisms, and those complicated by infective endocarditis, prove quite intractable but ultimately fatal. The type of case with profuse offensive discharge is the least worrying, as this indicates local saprophytic infection. Typical septicaemia is usually associated with absence of locheal discharge, generalised toxic symptoms and a disproportionately fast pulse. The accompanying charts are illustrative of the different types of puerperal sepsis, and their response to therapy.

*Abortion sepsis*, however, continues to take a high toll. These cases come in an advanced stage of general peritonitis, and probably most of them are the result of unwise attempts at induction. It is difficult to control this incidence, except by educating public opinion and by propagation of the right ideas on contraception.

2. *Abortion haemorrhage* is another aspect of the problem of abortions. This need not necessarily be a part of criminal attempts. The incidence of natural abortions is about 20% of total conceptions. Interruption of pregnancy in the early months usually means an unhealthy condition of the endometrium, and consequently the products of conception are morbidly adherent, thus leading to varying degrees of bleeding. Women are liable to neglect bleeding in the early months of gestation, and then get collapsed with onset of extra bleeding. Prompt



Chart I: Good Response to Sulphonamides.

January 3-1-39 — 2-2-39

Puerperal Septicaemia

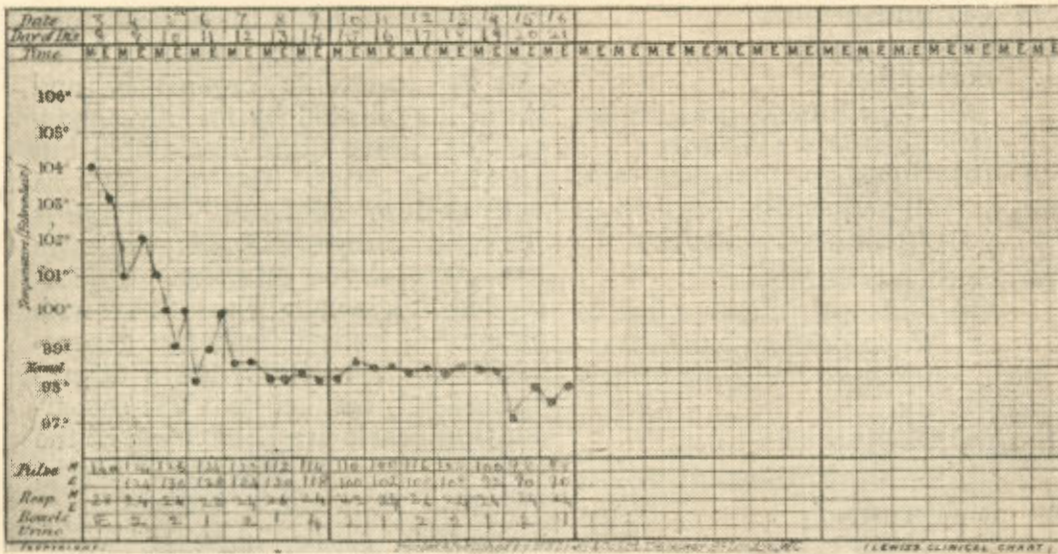


Chart I (a): Good Response to Sulphonamides.

Puerperal Sepsis

October 18-10-38 — 27-10-38

May 23-5-44 — 31-5-44

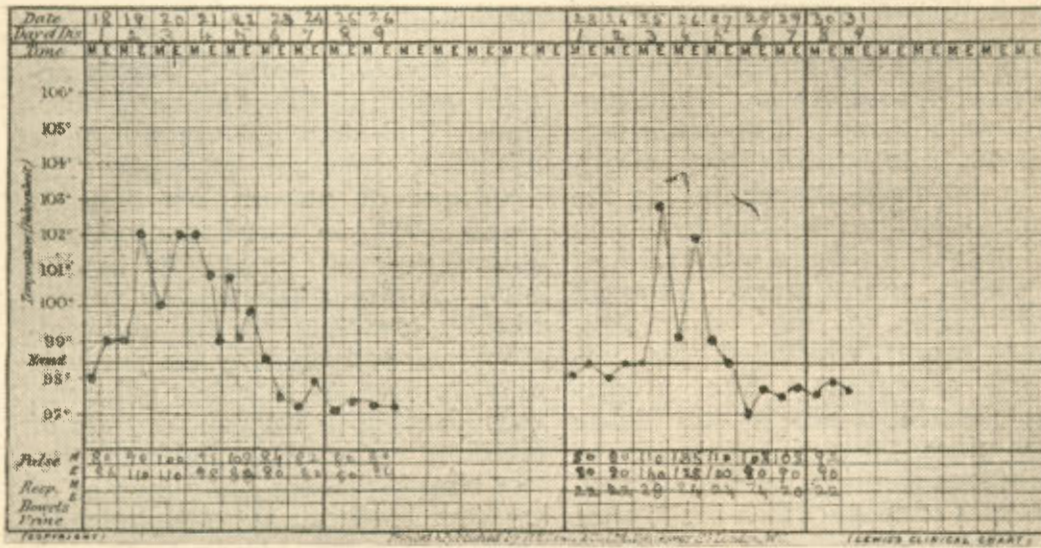


Chart II: No Response to Sulphonamides.

Puerperal Sepsis

November 26-11-36 — December 6-1-37

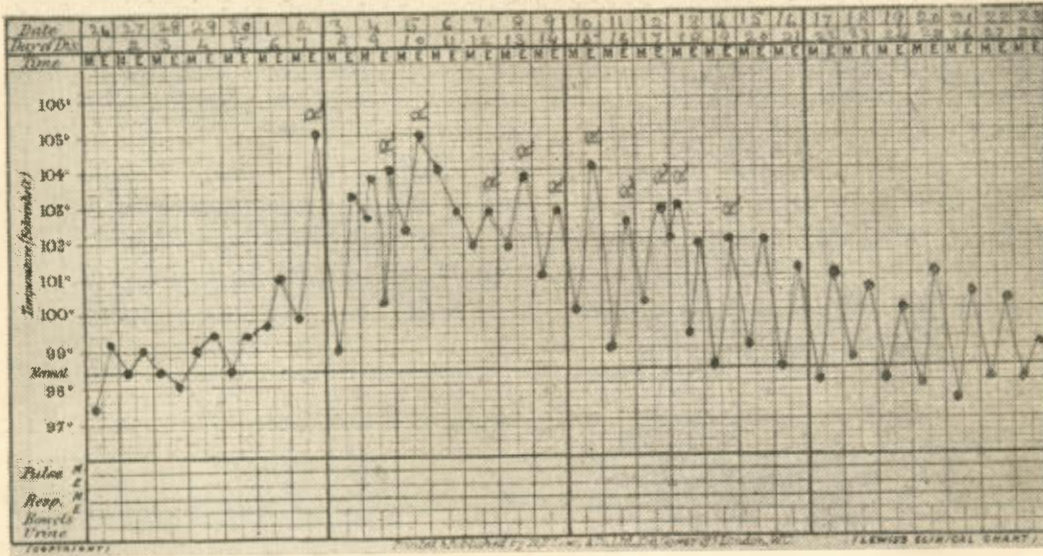


Chart III: No Response to Sulphonamides.

Puerperal Sepsis

October 26-10-40 — November 16-11-40

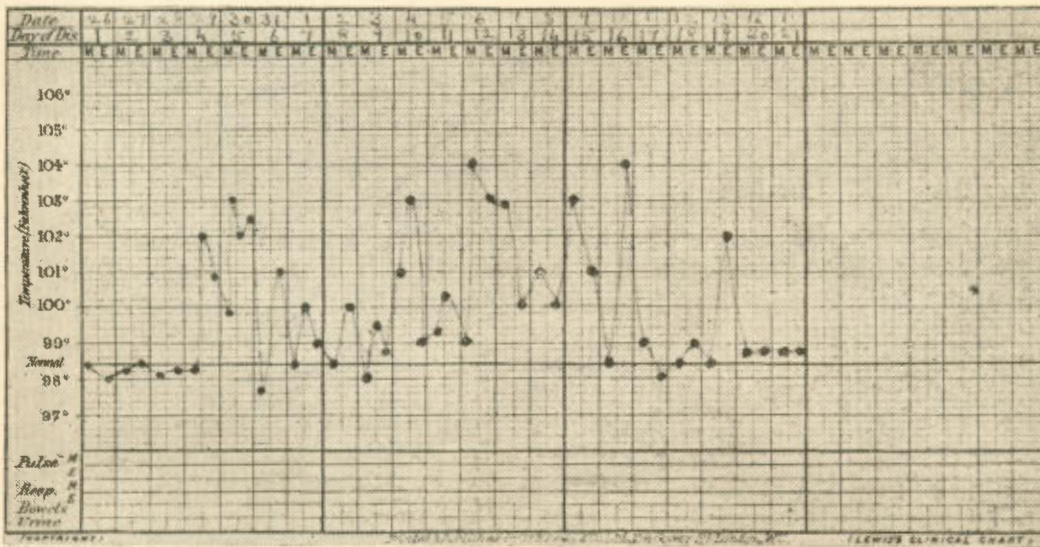




Chart IV: Good Response to Penicillin.

November 26-11-45 — December 9-12-45 Puerperal Cellulitis

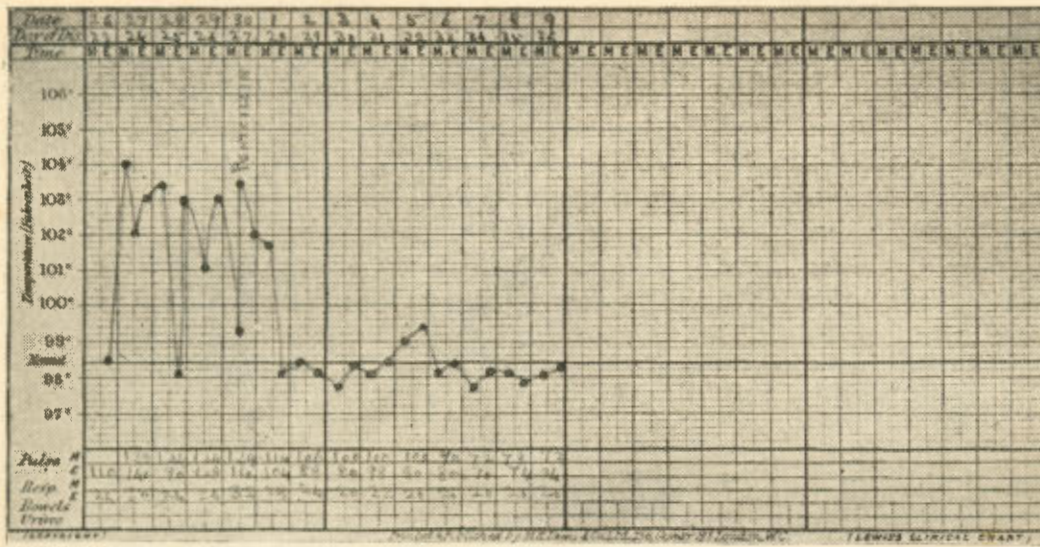
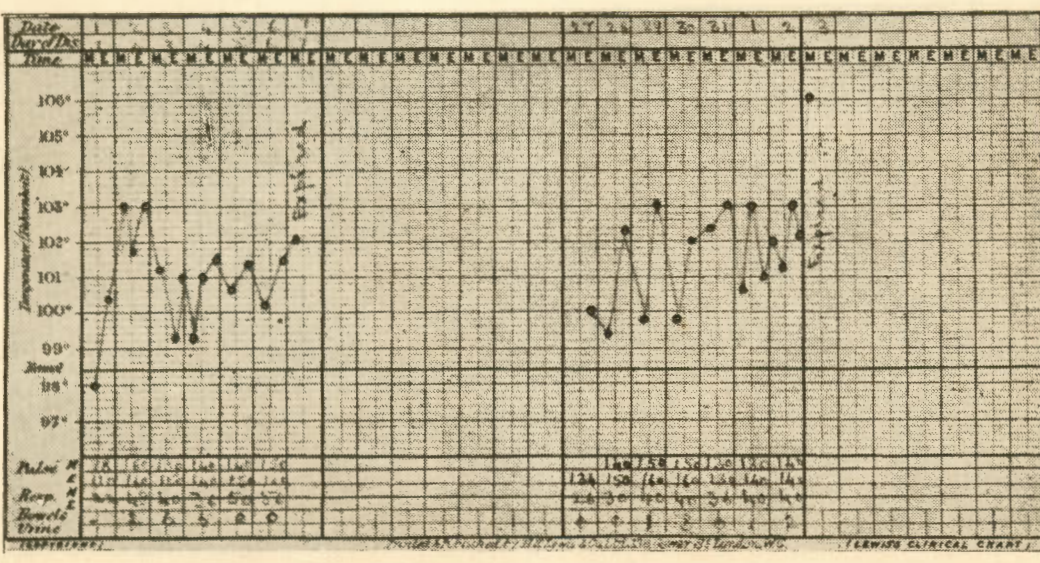


Chart V: No Response to Penicillin.

July 1-7-45 — 6-7-45 Puerperal Septicaemia  
May 27-5-45 — June 3-6-45





evacuation of the uterus and adequate blood transfusion should go a long way towards saving many a case.

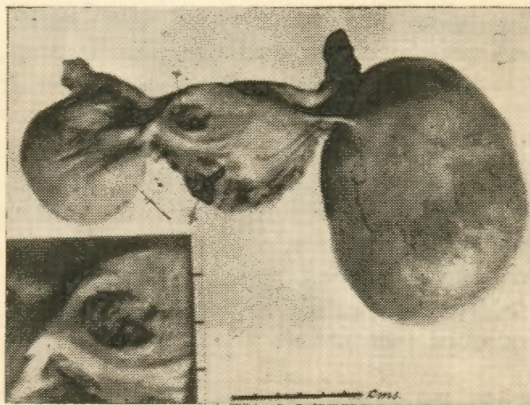
*Vesicular Mole.* The commonest mode of death under this head is through bleeding. There is a tendency to toxæmia, and this, coupled with the repeated bouts of bleeding, makes the patient very puffy and anaemic. Further attacks of bleeding are badly tolerated. We have already seen that careful supervision of the patient from the earliest months of gestation, and warning the patient against neglect of bleeding, will go a long way towards early diagnosis and prompt treatment. Treatment of vesicular mole has undergone reorientation. Hysterotomy has a definite place in the treatment, and is being practised frequently. The type of case suitable for such treatment will be one who has repeated bouts of bleeding, but the os remains spasmodically closed in spite of stimulation. Dilatation of the canal and vaginal evacuation of the uterus, under these circumstances, may, apart from the possibility of cervical lacerations, mean much bleeding, whereas vaginal evacuation in a case which has already partially dilated, is easily accomplished with the aid of repeated injections of pitocin. The uterine cavity should invariably be explored at the end of evacuation to ensure complete expulsion of the mole.

The presence of vesicular mole puts four hazards on the patient:

1. Haemorrhage, as already referred to
2. Sepsis
3. Perforation of the uterus
- and 4. Greater liability to deve-

lopment of chorion-epithelioma.

These cases are prone to sepsis because of the lowering of resistance due to toxæmia and anaemia, and because of the common necessity for manipulations. Perforation may be brought about by unwise manipulations of a softened uterine wall. The clinically perforating mole is rare. I have seen only two cases in all these years. One perforated near the cornu into the broad ligament, and the other (illustration) showed impending perforation at the fundus (posterior surface) and near the lower posterior surface of the body. Laparotomy was done because of persistent attacks of bleeding, a persistently positive (though not strongly positive) Friedman's test, and bilateral cystic ovaries, and these weak spots were noted. Compared to this, the incidence of chorion-epithelioma after a hydatidiform mole seems high.



Uterus showing sites of perforation and bilateral cystic ovaries.

*Ectopic Gestation.* This accounts for a small percentage of maternal deaths. The majority of ectopics



give warning signs and symptoms ere massive haemorrhage occurs, and therefore it should be possible to take up these cases for prompt treatment. Only a small percentage have sudden dramatic rupture and these may hardly give time for treatment. I have already indicated how cases can be suspected and kept under careful supervision if regular examinations in the early months of pregnancy are carried out. In 1939, I reviewed 134 cases of ectopic gestation with a view to evaluate the symptomatology and their differentiation from cases of sub-acute pelvic inflammation, with which it is often confused. I found that 72 per cent of cases were of the sub-acute type, thus giving sufficient time for diagnosis and treatment. The differentiation from sub-acute pelvic inflammation was noticeable in the symptom triad of ectopic, viz: amenorrhoea, pain and spotty bleeding, in that order of sequence, as contrasted with cases of inflammatory mischief, in which the majority of cases have no amenorrhoea and the pain comes on towards the end of menstruation. Tenderness and hypersensitivity are marked features of ectopic gestation. Thus by a careful evaluation of the symptoms, and their correlation with the signs it should be possible to diagnose a good number of ectopics fairly accurately so as to allow of prompt treatment.

3. *Puerperal Haemorrhage*. These are either ante-partum or post-partum. The two main causes of ante-partum haemorrhage are placenta praevia and abruptio placentae. The last decade or two has seen rapid strides in the diagnosis and treatment

of *placenta praevia*. Early resort to transfusion of blood and the right selection of treatment, of which caesarean section takes a prominent place, have revolutionised the management of these cases. The three common causes of death in placenta praevia are haemorrhage, shock (often due to incomplete rupture) and sepsis. Haemorrhage and shock are aggravated during attempts at vaginal delivery. The old type of treatment by internal podalic version and by forcible dilatation of the cervix are practically extinct. Only an occasional case, where the cervix is well dilated and the placenta is marginal and the membranes only recently ruptured may be suitable for internal podalic version. The most important thing is right judgment in the selection of treatment for each case. Caesarean section has a definite place in the treatment of placenta praevia, but this also has its limitations. Treatment of placenta praevia is the responsibility of a specialist. In modern institutions, cases are not examined internally till everything is ready for treatment, even for caesarean section, in case excessive bleeding occurs during examination. Some reports from abroad give a high incidence of morbidity in cases treated by caesarean section. This incidence can definitely be kept down if vaginal examinations, and above all vaginal manipulations are minimised prior to undertaking caesarean section. Time does not permit of a full dissertation on the treatment of placenta praevia, these cases often form sudden emergencies and are, perhaps even first in the home or at an out-of-the-way place by a general practitioner. A procedure which



may tide the case over temporarily and allow of easy transport (preferably by ambulance) is to give an injection of morphia and plug the vagina with sterile gauze.

*Abruptio Placentae.* This, occurring with the onset of labour, can usually be treated satisfactorily by artificial rupture of membranes but in the absence of labour pains, and particularly if the bleeding is of the concealed type, the problem is formidable. Such cases may need prompt caesarean hysterectomy. Cases have been reported of bleeding from various mucus and serous membranes, in which case even a hysterectomy is of no avail. It has been shown that there is lack of fibrinogen in these cases and that only the addition of fibrinogen to the blood transfused will save such cases.

*Post-Partum Haemorrhage.* Unfortunately this still takes a high toll. One may take this as an index of the efficiency or otherwise of an obstetric service. Post-partum haemorrhage can occur even after a normal labour. To meet such occurrences, emergency equipment (including salines, plasma and blood) should be kept handy in every labour-ward, and moreover, a senior obstetrician should be within easy call so as to guide the treatment. It is the lack of experienced personnel on the spot, and haphazard treatment by an excited and nervous junior, that makes for such high mortality under post-partum haemorrhage. The commonest type of post-partum haemorrhage is of the atonic variety. The aim then should be to get the uterus empty, even remove the placenta manually, if it has not been expelled, and ensure good con-

tractions of the uterus. The traumatic type is usually seen in cases of lacerations of the cervix, upper vagina and the lower segment. These may need suturing or plugging. Traumatic post-partum haemorrhage will be commoner in primiparae or in those who had operative delivery, whereas atonic haemorrhage will be seen more frequently in multiparae, even after a normal labour. A helpful precaution is injection of an ec-bolic just as the baby is being born. The uterus remains firm and the placenta separates without much bleeding.

#### 4. *Toxaemias*

*Hyperemesis Gravidarum.* The majority of these cases are of functional type and are amenable to treatment. A very small percentage are of the toxaemic type which will prove fatal, if pregnancy is not terminated in good enough time. Such a decision is difficult to arrive at, but the proper precaution is to keep these cases under strict observation bearing in mind the possibility of the toxic type.

Most cases of *eclamptic toxaemia* are preventable by careful ante-natal follow-up, but occasional fulminant types come on as a bolt from the blue and prove fatal. Management of developed toxaemia requires planned treatment. Modified Stronganoff's method has stood the test of time. "Sedation" seems the watchword. New drugs (hexamethonium bromide, T.E.A.B. and T.E.A.C.) are under trial for keeping down the blood-pressure, but I feel it is not just a matter of bringing down the pressure which tends to rise just as quickly. Some thirty years ago, I



gave a trial to "veratrone", a drug which brings down the blood pressure very rapidly. At another Centre, trial had been given to repeated venesection and later to repeated injections of veratrone, with a view to keep down the blood pressure. I found that the fits did not necessarily recur although the blood pressure had gone up in less than an hour of giving the veratrone, and this result, I presumed, was due to the prolonged sedative effect of the drug. Veratrone, though helpful, has to be used with caution, as it also slows the pulse rate, almost halving it in about twenty minutes, and thus it is not suitable for all cases. Magnesium sulphate given parenterally, has almost replaced veratrone, though I have noticed of late that a number of firms have started putting out preparations made from veratrum viride and advertising these for use in cases of eclampsia. Isolation of the patient and minimisation of external stimuli are very helpful in these cases. If the case does not respond promptly to the above measures, artificial rupture of membranes is found helpful. Induction of labour in cases of persistent pre-eclamptic toxæmia, which does not respond to treatment or artificial rupture of membranes during labour when the eclamptic fits continue, has definitely helped to cut short the attack. The relief of tension in the uterus is considered beneficial. It is best to be prepared to shorten the second stage (unless the head progresses fairly rapidly) and thus minimise irritation. Caesarean section would have a very limited scope in the treatment of eclamptic toxæmia, if the rest of the treatment is well planned.

*Nephritic toxæmia* and *hypertension* need careful supervision during pregnancy with a view to possible need for premature induction. These cases are liable to go in for abruptio placentae and obstetric shock, both being serious complications.

*Acute yellow atrophy* and its ally *infective hepatitis* are very formidable complications. In the absence of definite aetiology, it is difficult to chalk out prophylaxis, but prompt and early treatment has been found helpful in an occasional case.

5. *Accidents of labour* form a sad chapter for discussion, as most of these are preventable by proper antenatal care and the right judgment in carrying out procedures during labour. The cases may be seen too late for ideal treatment, on account of negligence on the part of the patient or her relatives, or overconfidence and improper judgment on the part of the attending doctor. Even specialists are liable to err in judgment, for in some border-line cases it is difficult to know if a caesarean section or delivery per vaginam is the right procedure. In some neglected cases one may have to be bold enough to decide to sacrifice the already embarrassed foetus, and carry out destructive operations rather than subject the woman to undue strain and risk lacerations by unwise traction with forceps. Caesarean section done late in labour and particularly after several vaginal examinations, or even vaginal manipulations, is liable to be complicated by sepsis. Granted antibiotics are handy, we must however remember that not all organisms are sensitive to antibiotics.



*Rupture of the uterus* commonly follows on obstructed labour or after unwise manipulations on a uterus already under stress, but there is a certain percentage of idiopathic rupture, particularly noticed in the multipara. The best prophylaxis for such cases will be contraception or sterilisation, so as to prevent future pregnancies. Apart from this, early diagnosis and prompt treatment of rupture of the uterus supported by adequate transfusion, can and has saved a number of cases.

*Acute puerperal inversion* has been credited with forcible manipulations as its aetiology. Be that as it may, there are a number occurring spontaneously due to forcible contractions and sudden bearing down efforts on the part of the patient. Prompt diagnosis and well-chosen and well-planned treatment can save a number of these.

6. *Shock* is most often the result of trauma or unduly prolonged labour and as such the prophylaxis is obvious, but there are a number of cases occurring idiopathically after a perfectly normal labour. Well-planned treatment may save these cases. Sheehan has shown that haemorrhage and shock lead to necrosis of the pituitary. If these cases survive, the possibility of Simmond's disease has to be borne in mind.

*Embolism* is fortunately much rarer these days owing to early ambulation and the lowered incidence of infection.

#### *Certain Social Factors*

These play a prominent role in making varied sections of the popu-

lation more vulnerable to certain diseases.

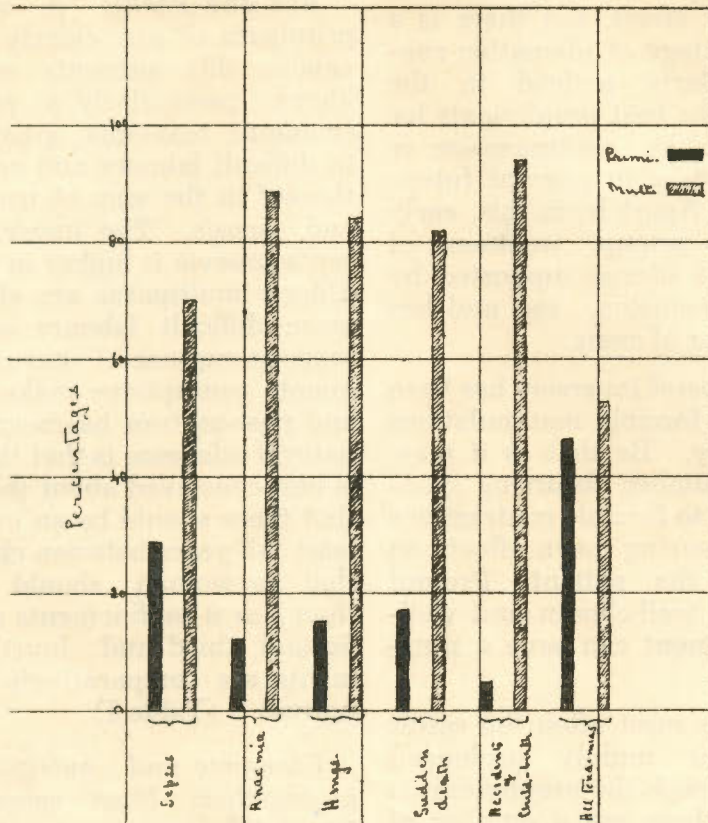
*Age and Parity.* A very young primipara or an elderly primipara (above 30) presents special problems, particularly a proneness to eclamptic toxæmia, greater liability to difficult labours and consequences thereof in the way of trauma, shock and sepsis. The incidence of placenta prævia is higher in multiparæ. Elderly multiparæ are also liable to more difficult labours and to spontaneous rupture of uterus. Too frequent conceptions make for inertia and post-partum hæmorrhage. The natural inference is that the first child is best conceived about the age of 20, that there should be an interval of at least 2-3 years between children, and that no woman should have more than 5 or 6 confinements at the most. Second, third and fourth confinements are comparatively easy and normal. (Table I).

*Economic and nutritional factors* go together. Most cases of nutritional deficiency are seen in the lower classes, but the better and more fortunate classes are not immune to nutritional deficiencies, because of want of understanding and certain fads of individuals. We have seen how balanced dietary and hygienic living helps to prevent many a disease. Ignorance and superstition play an important role in precipitating diseases in our country. (Table II).

A resume of the factors leading to maternal mortality will make it obvious that many a disease is preventable. The Departmental Committee in England divided the causes into



TABLE I  
Distribution of Maternal Deaths by Main Causes Among Primigravidae and Multigravidae.



N.B.—Table taken from "Report on an Investigation into the Causes of Maternal Mortality in the City of Bombay" by J. Jhirad. Health Bulletin No. 29 Govt. of India Publication, 1941.

avoidable factors and unavoidable ones. This Committee's findings showed that 44% were avoidable. The investigations carried out in India showed that avoidable factors were present in 53.4%, 80.5% and 77.2% of cases investigated in Madras, Calcutta and Bombay respectively. The Departmental Committee (England) tabulated the avoidable factors under four headings:—

(A) Omission or inadequacy of ante-natal examinations

- (B) Error of judgment in the management of the case
- (C) Lack of reasonable facilities
- (D) Negligence of the patient or her friends

Classifying the cases according to the above criteria, the enquiry in Bombay showed that the largest percentage fell under the group of neglect to book, and negligence on the part of patient or relatives.

If one took the lists of maternal deaths at certain large institutions



TABLE II  
Causes of Death and Economic Status

Cause of death.	Economic status.			No informa- tion available	Total by cause of death
	Poor	Middle class	Rich		
Septic abortions	8	1	..	1	10
Abortions non-septic	2	2	..	..	4
Ectopic gestation	4	1	..	1	6
Accidents of pregnancy	1	..	..	..	1
Puerp. heamorrhages	23	6	1	2	32
Puerperal sepsis	115	12	1	5	133
Eclampsia & album.	26	6	2	2	36
Other toxaemias	4	1	..	1	6
Sudden death	22	1	..	..	23
Accidents of childbirth	15	3	..	..	18
Unspecified conditions of puerperium	2	..	..	1	3
Anaemias	52	5	..	1	58
Acute yellow atrophy	6	2	..	2	10
Total	280	40	4	16	340
Percentage	82.35	11.76	1.18	4.71	..

N.B.—Table taken from "Report on an Investigation into the Causes of Maternal Mortality in the City of Bombay" by J. Jhirad, Health Bulletin No. 29, Govt. of India Publication, 1941.

for a number of years the trend in the drop under certain headings is obvious.

sepsis in the 1944-52 series were in cases admitted after interference or after delivery. Toxaemias, of which

Main Diseases	1935-1943		1944-1952		
	Hospl. A	Hospl. B	Hospl. A	Hospl. B	
Puerperal sepsis ..	21.8%	27.0%	10.0%	9.6%	These include P.N. admissions.
Toxaemias ..	17.4%	11.0%	15.6%	15.0%	Not inclusive of hepatic toxaemia
Haemorrhages ..	8.7%	10.6%	13.2%	15.6%	P.P.H. accounted for 30% deaths from hmg. in the first series and 48.8% in the 1944-52 series
Accidents of labour ..	14.7%	9.8%	10.0%	11.5%	includes shock and embolism
Anaemia ..	27.8%	33.9%	28.0%	28.7%	

The above table gives percentages of total maternal deaths from obstetric causes. Most of the deaths under

eclamptic toxaemia formed the major proportion, do not show a proportionate decrease. Under haemor-



rhages, there is an apparent proportionate increase, but the actual incidence of deaths under post-partum haemorrhage is proportionately high, as deaths under ante-partum haemorrhages have been definitely decreased, owing to prompt and efficient treatment. Accidents of labour still leave much to be achieved. Anaemia keeps up a steady rate and tops the list under individual causes.

There seems much scope for reducing the maternal mortality rate. In fact this has been achieved in the West. The figures for England show a drop from 3.13 per 1000 in 1939 to 1.01 per 1000 in 1948, and there is a definite downward trend in recent years. It was 0.8 per 1000 in 1951. A practice that has been followed in most of the towns in U.S.A. is the appointment of a committee of a few specialists who scrutinise all the death records and then discuss the possible alternatives to treatment with the obstetrician in charge of the case. This has had a salutary effect in improving the maternity services and the methods of treatment, and thus minimised maternal deaths. Investigations of this nature should be organised in every municipal town in India, with the help of the Health Officer's staff, but the investigators, both those collecting the data and those responsible for scrutinising the same, will need to be very tactful in their approach, if the co-operation of the practising doctors and the midwives is to be enlisted. Suggestions for organising such enquiries have been drawn up by the Maternal and Child Health Committee of the Indian Council for Medical Research. A routine post-mortem in every case will prove most

helpful in arriving at the right cause. A pilot enquiry of this nature is being carried out in Bombay, and it is noticed that a large percentage of the deaths would be preventable, if the public realised their responsibility, if the ante-natal, intra-natal and post-natal care was organised so as to reach every individual, and if midwives and practitioners sought expert advice early enough in complicated cases. There are certain emergencies, e.g. haemorrhages, when the patient is too collapsed to be shifted from her premises. A so-called Flying Squad, consisting of an experienced obstetrician, an anaesthetist and a blood transfusion officer, as also a couple of nurse-midwives, carrying all the paraphernalia for transfusion, and if necessary for certain operative procedures on the spot, will prove helpful in saving many a life. Every modern town should organise a *Blood Transfusion Service* for meeting all emergencies, including obstetric emergencies. Proper arrangements for *transport* will minimise shock and collapse. The whole problem of reduction of maternal mortality boils down to better education of the public, improved economic status to allow of better housing and balanced diet, and above all an efficient and comprehensive Maternity Service.

Maternity practice is considered lucrative, and one notices a tendency on the part of practitioners to start small maternity homes, even in out of the way places. These are certainly necessary, but as these homes are rarely equipped to meet emergencies, it is essential that these practitioners only confine their practice to normal cases, cases upto fourth



or fifth parity. Any case in which complications are anticipated should be referred to bigger institutions having facilities as well as the experienced staff for meeting emergencies. We can serve the population best if we are prepared to accept our limits.

To sum up—a comprehensive Maternity Service Scheme can be worked out for each place. For the successful working of such a scheme, there should be proper understanding of the principles underlying the same, co-operation between the staff of larger and smaller institutions, and above all a desire on the part of every individual, working for the scheme, to serve the best interests of the public.

1. In a district town there may be one central hospital with well-trained and experienced staff and facilities for meeting all emergencies. There should be sufficient number of beds to allow of admission of a good proportion of normal cases and for emergency admissions from maternity homes (public and private) and from patients' homes.

2. A service organised for the general public should have a number of maternity homes, strictly for delivery of normal cases, radiating from the central hospital, and each serving a population within a radius of one or two miles, according to the density of the population. These should be staffed by a medical woman who has had some practical experience in a hospital, adequate nursing staff, and a sufficient number of health visitors to cover the area.

3. Regular Ante-Natal Clinics should be held and cases sorted out

- (a) Normal cases upto 4th parity

for admission to the Maternity Home

- (b) Primiparae and women with higher parity and anticipated complications for reference to Hospital Clinic.

4. A regular liaison should be kept up between the hospital and each of the maternity homes so that help and advice are given by the experienced staff of the hospital and cases from the maternity homes are seen periodically by the expert staff. Such an arrangement will be helpful to the patients, who need not go long distances and waste a number of hours at a crowded ante-natal clinic, and yet each one would get the benefit of expert advice any time it was needed.

5. Private Maternity Homes run by midwives or general practitioners should have similar liaison either with the hospital or with private consultants. They should restrict admissions to normal cases and not aspire to take in complicated cases.

6. There should be Registration and Supervision of the work of all practising midwives, so that their efficiency is kept up, and by enactment, the untrained dai is gradually eliminated from practice.

7. There should be Registration and Supervision of all Maternity Homes.

8. Improvement in the teaching of medical students.

9. Post-Graduate and Refresher Courses for medical practitioners.

10. Adequate training of midwives.



11. Refresher courses for midwives and health visitors.

12. Proper laboratory facilities accessible to the smaller centres.

13. Organisation of a "Flying Squad" and Transfusion Service to meet urgent emergencies at smaller centres and at the patient's home.

14. Proper transport facilities for emergency cases.

15. A good follow-up in the ante-natal and post-natal periods and organisation of post-natal and Infant Welfare Clinics, both at the central hospital as also at each of the smaller maternity centres, both public and private.

A careful scrutiny of all maternal and neo-natal deaths and of stillbirths, supported by autopsy, and discussion of the possible preventive factors in each with the individual concerned, should go a long way to-

wards reducing the mishaps in obstetric work.

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