CAUSES OF PERINATAL MORTALITY

by

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A review of some of the important causes of perinatal mortality is presented from the Department of Obstetrics and Gynaecology, Assam Medical College Hospital, Dibrugarh, for a period of one year, September 1963 to August 1964.

Perinatal mortality is defined as stillbirths and neonatal deaths within 7 days of birth. The dead-birth, after viability is attained, has been defined as stillbirth.

In spite of each mother expecting a living healthy child at times she cannot have it due to some hazards beset to the foetus during antenatal, intranatal and neonatal periods. It is the concensus of opinion of all authors that perinatal mortality can be reduced by thorough study of the causes peculiar to foetal and neonatal lives.

Western countries have succeeded in reducing the perinatal mortality rate within the last decade to a considerable degree, but in our country the rate still remains alarmingly high. This has led us to study the subject with a view to acquire information as to the causes of this high rate in our hospital. The study is the first attempt not only in our hospital but also in the whole State.

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Classification

The classification of the causes of stillbirths and neonatal deaths in Scotland for many years is primarily clinical in its orientation. Baird, Walker and Thomson (1954) described the following classification.

(1) Malformation:— Anencephaly, other central nervous sytsem defects, multiple cardiac abnormality, others (including inencephaly and oxycephaly).

(2) Toxaemia:— (without APH), (with APH).

(3) Ante-partum haemorrhage: (a) accidental, (b) placenta praevia and (c) of uncertain origin.

(4) Mechnical stress:— vertex delivery (including face).

(5) Breech delivery, cord compression, others (including ruptured uterus).

(6) Serological incompatibility, maternal disease, infection of infant.

(7) Placental insufficiency of unknown origin of mature babies.

(8) Prematurity unexplained, others specific causes.

(9) Information inadequate.

This classification with a few modifications was applied in 1958 by the

British Perinatal Mortality Survey of the National Birth-Day Trust Fund. (Neville Butler, 1961).

Anatomico-pathological investigations show a well defined group of causes of death. A national difference in the importance of each group of causes may indicate the influence of local factors. Below will be seen these differences according to the autopsy studies.

Davis (U.S.A.) prematurity, anoxia, congenital malformation and birth trauma.

MacFarlane (Canada): anoxia, malformation, abnormal pulmonary ventilation, immaturity, haemolytic diseases, trauma and sepsis.

Potter (Chicago) malformation, trauma, anoxia, infection, blood dyscrasia abnormal pulmonary function, other iatrogenic causes, no pathological state at autopsy with or without possible maternal factors and not elsewhere classified.

Incidence

Bound, Butler and Spector (1956) carried out the perinatal mortality survey in Great Britain, and the figures of major anatomical findings, 32.2 per 1,000 births, were revealed at a symposium on perinatal mortality held at the Royal College of Obstetricians and Gynaecologists, London (October 1962).

Davis and Potter took up the study in Chicago Lying-in Hospital and reported 42 deaths per 1,000 births in 1931. There was progressive decrease of perinatal deaths in the hospital from 19 in 1956 to 17 in 1961. Krishna Menon (1963) presented broadly the problems of perinatal mortality with special reference to the Indian subcontinent. His paper is based on clinical and pathological studies on perinatal deaths carried out in the medical colleges in different parts of India. He reported the perinatal mortality rate, 78 per 1,000 births.

Material and Methods

From 1st September 1963 to 30th August 1964, 108 perinatal deaths were recorded out of 2,341 births in the department of Obstetrics & Gynaecology, Assam Medical College Hospital, Dibrugarh. Out of 108 deaths, 100 were available for autopsy study. Post-mortem examination was done in all these cases and the causes and course of pregnancy and labour of mothers were studied so as to correlate the different obstetrical findings and the cause of death of the foetus.

Analysis and Results

The different autopsy findings are shown in the following Table.

Majority of perinatal deaths in our hospital are due to some complications of pregnancy and labour. In many cases autopsy is inconclusive or indicated only the immediate cause of death. Clinico-pathological correlation is undoubtedly necessary. In a large number of cases the main anatomical lesions have been caused by foetal anoxia prior to delivery. Analysis of perinatal mortality according to the major anatomical findings at necropsy is the first of the more important steps towards a useful classification of perinatal mortality (Claireaux, 1963).

In our study the highest incidence, 49 per cent, was due to anoxia. This is probably due to negligence in ante-

TABLE I

Causes of perinatal mortality found at autopsy

Foetal pathology (autopsy)	Mature above 2500 Gm,	Premature 2500 Gm or less	Total	%
Anoxia	21	28	49	49
Birth injury	8	2	10	10
Congenital malformation	4	5	9	9
Pneumonia	2	6	8	8
Pulmonary syndrome of the new-born	2	2	4	4
Maceration only	2	1	3	3
Others	3	14	17	17

natal care, booking for delivery and late attendance into the hospital where some complications of either pregnancy and labour arise.

TABLE II

The main pathological findings in anoxia

Histopathological findings	Number of cases
Interstitial, septal and intra-alveolar haemorrhage of lung (photomicrograph Fig. 1.)	18
Myocardial haemorrhage	3
Subcapsular and interlobular haemorrhage of thymus gland (Fig. 2)	3
Subcapsular haemorrhage of liver	2
Haemorrhage destroying hepatic cells	1
Medullary haemorrhage of suprarenal gland	6
Intertubular haemorrhage of kidney	2
Subarachnoid and subdural haemorrhage	5
Pulmonary alveoli distended with squames (Photomicrograph Fig. 3)	7
Aspirated meconium in alveoli of lung (Photomicrograph Fig. 4)	2
Total	49

The second important cause of death was birth injury. In presenting this aspect the main cause was intracranial injury. There were few cases showing mild extracranial and cranial injury but did not account for the cause of death. The pathological findings in birth injury are shown in Table III.

Major congenital abnormalities accounted for 9 deaths. The different types of anomalies with numbers are shown in Table IV.

Evidence of anoxia was present in 3 cases of congenital abnormality. Two cases of neonatal deaths had pneumonia. Out of two of the anencephalic foetuses, pulmonary hypoplasia was present in 1 case., the small size of the suprarenal glands was noted in both the foetuses and thymus was enlarged in 2 foetuses, but histologically no abnormalities were detected in the thymus.

Summary

During one year period, out of 108 perinatal deaths one hundred cases were available for detailed autopsy study in the department of Obstetrics and Gynaecology, Assam Medical College, Hospital. The incidence of perinatal mortality in that period was 46.1 per 1,000 births. The highest in-

TABLE III

Pathological findings in birth injury

Pathological findings	Liveborn	Stillborn	Total
Tentorial tear	2	3	5
Rupture of the tributaries of the vein of Galen	2	—	2
Tear of falx cerebri	1	—	1
Massive subdural haemorrhage	—	1	1
Haematoma in the posterior cranial fossa	1	—	1
	6	4	10

TABLE IV

Congenital Anomalies	Liveborn	Stillborn	Total
Anencephaly	—	2	2
Bilateral hare lip involving maxilla and palate with exomphalos	—	1	1
Bilateral hare lip involving maxilla but without involving palate, and exomphalos	—	1	1
Cleft palate, varus deformity of both feet and achondroplasia	1	—	1
Occipital encephalomyelocele with other multiple deformities	—	1	1
Short neck with occipital menigo-encephalocele	1	—	1
Congenital cystic hygroma of neck	—	1	1
Hypoplastic lungs	—	1	1
	2	7	9

cidence of 49 per cent deaths due to anoxia at autopsy was the major anatomical finding recorded.

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References

1. Baird, D., Walker, J. and Thomson, A. M.: J. Obst. & Gynec. Brit. Emp., **61**: 433, 1954.
2. Bound, J. P., Butler, N. R. and Spector, W. G.: Brit. Med. J., **2**: 1191, 1956.

3. Claireaux, A. E.: Modern Trends in Obstetrics, London, 1963, Butterworths, p. 191.
4. Davis, E. and Potter, E. L.: Excerpta Medica, 12: 47, 1959.
5. Krishna Menon, M. K.: International Gynec. and Obst. 1: 30, 1963.
6. Neville Butler: Brit. Med. J., 1: 1313, 1961.
7. Potter, E. L.: Pathology of the Foetus and Infant, ed. 2, Chicago. 1962, Year Book Medical Publishers, Inc.

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