

PERINATAL MORTALITY

A Clinico-pathological Correlation of Causes Among 400 Autopsies

by

B. M. V. SHETTY*, M.D.,

VIMALA NAYAR, M.B.B.S., D.G.O.,

and

SATWANT KAUR SOKHI, M.B.B.S., D.C.O.

During the two-year period ending June 1960, 400 cases of perinatal deaths were available for complete autopsy. These comprised 194 dead births and 206 neonatal deaths. According to weight, 224 were premature, i.e. less than 2,500 gms. at birth. Complete autopsy was supplemented by a detailed histopathological study of the various organs and tissues. Based on these findings, the principal causes of perinatal deaths were—anoxia, birth trauma, and infections, besides congenital malformations and macerations.

As the significance of the pathological lesions can be fully appreciated only against their maternal and obstetric back-grounds, a clinico-pathological correlative analysis is

* Associate Professor of Pathology (Gynaecology) Madras Medical College, Madras and Pathologist Institute of Obstetrics and Gynaecology, Government Hospital for Women & Children, Madras-8.

Read at the 11th All-India Obstetric and Gynaecological Congress at Calcutta in January 1961.

made in what follows. However, it must be admitted that assigning a precise cause of death in each case is complex and difficult; for perinatal mortality is governed by many factors—maternal and obstetric, foetal and neonatal.

Table I shows the foetal loss classified according to clinical causes. Trauma and stress asphyxia (forming 40.2%) include various obstetric factors like malpresentations, compound presentations, cord prolapse and obstetric interference required during labour, all of which can adversely affect the foetus.

Antepartum haemorrhage takes its toll at 14.9%. Obvious fatal congenital anomalies were present in 5% of the cases. In over 23% there was no cause evident clinically.

Findings at autopsy and their correlation with various clinical factors are documented in Table II.

At autopsy, anoxia accounted for nearly half the cases (48%) the major associated maternal factors being antepartum haemorrhage and toxæmia. The second important cause was birth trauma, 20.7%. The

TABLE I
Perinatal Deaths classified according to Clinical Causes in 400 Autopsies

Clinical causes	Mature	Premature	Total	%
Trauma & stress				
asphyxia	94	67	161	40.2
Cause unknown ..	36	57	93	23.3
Antepartum haemorrhage	15	44	59	14.9
Toxaemia	5	12	17	4.2
Maternal diseases ..	7	14	21	5.2
Congenital anomaly ..	8	12	20	5.0
Infection of baby ..	11	18	29	7.2
Total ..	176	224	400	100

TABLE II
Clinicopathological Causes of Foetal Loss as Found by Autopsy in 400 Perinatal Deaths

Foetal pathology	Trauma & stress asphyxia	Toxaemia	Maternal diseases	Antepartum haemorrhage	Infection & others	Cause unknown	Total	Percentage
Anoxia	72	28	2	51	17	21	191	48.0
Birth injuries ..	65	5	—	3	1	9	83	20.75
Congenital foetal anomalies	—	—	—	—	—	28	28	7.0
Pneumonia	3	4	2	3	2	5	19	4.25
Massive pulmonary haemorrhage ..	2	4	2	3	2	5	18	4.5
Hyaline membrane ..	1	1	—	2	2	1	7	1.75
Infections	—	1	1	1	2	4	9	2.25
Blood dyscrasias ..	—	1	3	1	—	2	7	1.75
Maceration	4	4	4	6	7	6	31	8.0
Cause unknown ..	1	—	1	—	—	5	7	1.75

frequent association between this state and obstetric trauma and stress is natural and expected. Pulmonary lesions like pneumonias (4.25%), pulmonary aspirations due to anoxia, massive haemorrhages in the lungs (4.5%) and hyaline-like membrane (1.75%), extensive enough to be considered lethal, together were present in just over 10%. These pulmonary lesions were greatly influenced

by maternal factors, and further, premature infants showed them more often than the mature ones.

Blood dyscrasias include 4 cases of erythroblastosis foetalis and 3 cases of unexplained extensive haemorrhages in all the viscera at autopsy.

Fig. 1 illustrates the relative frequency of major causes of death in the mature and premature groups. Prematures were more liable to

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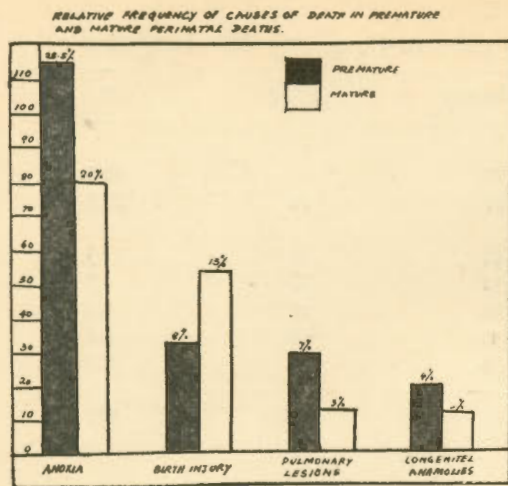


Fig. 1.

finding, deserves further analysis. Table III reveals that in about 56% of cases, there was an associated maternal factor. Antepartum haemorrhages and toxaeemias were the most important ones.

Again Table IV shows that major obstetric factors were associated with anoxia almost to the same extent. Of the obstetric factors, prolonged labour, cord complications and some form of obstetric interference were the leading ones.

In the anoxic group two-thirds of the mature deaths had a contributory obstetric cause, while a mater-

TABLE III
Intrauterine Anoxia, Maternal Factors

	Premature	Mature	Total	Percentage
Antepartum haemorrhage	43	15	58	30.3
Toxaemias	17	8	25	13.0
Pyrexia & other illnesses	12	8	20	10.4
Others	2	2	4	2.1
No cause	40	45	85	44.2
Total	114	78	192	100

TABLE IV
Asphyxial Deaths (192) Associated Obstetric Factors

	Premature	Mature	Total	Percentage
Prolonged labour ..	12	14	26	13.5
Cord complications ..	12	13	25	13.0
Obstetric interference ..	7	13	20	10.4
Malpresentations ..	11	5	16	8.3
Others ..	15	7	22	11.5
No obstetric cause ..	57	26	83	43.3
Total ..	114	78	192	100

anoxic deaths while mature babies were more prone to birth injuries.

Anoxia, being a major pathological

nal cause was associated in a higher percentage of premature infants as shown in Table V.

TABLE V
Anoxic Deaths (192)
Relative Incidence of Obstetric and Maternal Factors in Mature
and Premature Infants

Associated with	Mature	Premature
Obstetric cause	66.7%	50%
Maternal cause	43.0%	65%

The relationship between birth trauma and mode of delivery is shown in Table VI. This includes only those cases where tentorial tears, rupture of the vein of Galen and other evidence of trauma were present. Anoxic intracranial haemorrhages are not included here.

More than 50% of the birth injuries were seen among breech

deliveries and forceps deliveries. What is more striking is that prolonged labour and even what was deemed to be natural delivery could result in birth trauma in about 30% of the cases. Probably intracranial injuries, like tentorial tears, were due to excessive moulding and rupture of vessels to excessive venous engorgement.

TABLE VI
Birth Trauma in Relation to Mode of Delivery (83)

	Premature	Mature	Total	%
Natural delivery	12	8	20	24.1
Prolonged labour with natural delivery	1	4	5	6.0
Breech assisted	9	1	10	12.1
Breech extraction	2	11	13	15.6
Forceps outlet	2	7	9	10.8
Forceps midcavity	1	10	11	13.3
Internal podalic version	3	5	8	9.6
Others	3	4	7	8.5
Total	33	50	83	100

TABLE VII
Macerated Foetuses — Clinico-pathological Correlation

Foetal pathology	Associated factor	Premature (22)	Mature (10)	Total (32)
Intrauterine anoxia:		12	6	18
	Acute illness	1	4	5
	A.P.H.	6	—	6
	Toxaemia	3	1	4
	Prolonged labour	2	1	3
Unknown		9	—	9
Intrauterine infection		1	3	4
	Sepsis	1	2	2
	Syphilis		1	2
Diabetic mother			1	1

Of the 32 born macerated (Table VII) some obstetric or maternal factor was present in 18, and no cause could be found in 9.

Though prematurity *per se* was not taken as a cause, its importance as a major contributory factor cannot be ignored (Table VIII). Associated factors with prematurity are listed in Table VIII.

the anoxic deaths. Considering the first 24 hours 90% of the traumatic deaths occurred while only 2/3rds died in the anoxic group. Lethal massive pulmonary haemorrhages took their toll at 47% on the 2nd and 3rd days of the neonatal period.

Conclusion

From this overall statistical study

TABLE VIII
Factors associated with Prematurity (224)

	N.N.D.	D.B.	P.N.D.	%
Cause unknown ..	37-5=32	30-5=25	67=57	25.4
Antepartum haemorrhages	14	35	49	21.8
Toxaemia	28	16	44	19.6
Acute illness	19	9	28	12.5
Multiple pregnancy ..	11	8	19	8.4
Hydramnios	11	5	16	7.1
Others	8	3	11	5.0
	123	101	224	

N.N.D., Neonatal deaths; D.B., Dead births; P N.D., Perinatal deaths.

While in about 40% antepartum haemorrhage and toxaeias appeared to be contributory, multiple pregnancy and hydramnios formed a smaller group.

The period of survival among the neonatal deaths, when correlated with birth weight and lethal factors, revealed some interesting data. Mature babies, or those weighing less than 4 lbs., formed 50% of the first-day deaths. Nearly 45% in the birth trauma group succumbed during the first 6 hours as compared to 29% of

and a short analysis of perinatal deaths the conclusion seems inescapable that we have a large number of preventable causes of perinatal mortality. Improved obstetric and paediatric care can certainly help in reducing the overall death rate. That, indeed, such a progress can be accomplished is indicated by the welcome trend observed in our own institution: the perinatal mortality rate of 275/1000 in 1943 declined to 93.5/1000 during 1958-60.