Perinatal Autopsy - A Six Year Study

Chitralekha P. Dandekar
Vijaya V. Mysorekar
Saraswati G. Rao
V. Anupama

Currently, the autopsy rates are declining due to various factors(l). However, it has been shown that autopsy can change the clinical diagnosis or add significant information to it in a high proportion of cases(2). The benefits of perinatal autopsy are clear: confirmation, clarification and correction of antemortem diagnoses; reassurance of family members when the specific cause of death becomes certain; and discovery of hereditary disorders, allowing genetic counselling and prophylaxis. It may help pediatricians to reduce perinatal mortality in future cases. The present perinatal autopsy study indicates the common causes of perinatal mortality at our Institution in Bangalore.

From the Department of Pathology, M.S. Ramaiah Medical College, Bangalore 560 054.

Reprint requests: Dr. Chitralekha P. Dandekar, Professor and Head, Department of Pathology, M.S. Ramaiah Medical College, Gokula Extension Post, Bangalore 560 054.

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Methods

The study comprised a retrospective analysis of 144 perinatal autopsy cases received in the Department of Pathology, M.S. Ramaiah Medical College, Bangalore, during a six-year period (January 1991 to December 1996). The clinical and autopsy data for each case was collected from the departmental records. The cases were analyzed for gross congenital abnormalities and the histopathology material was reviewed. Based on the major and associated pathological findings, an attempt was made to elucidate the definite cause of death wherever possible.

Results

During the six year study period, there were 401 perinatal deaths out of the total of 6365 births in our hospital (perinatal mortality rate-63/1,000). A separate categorization of still births and early neonatal deaths was not done. Autopsy was performed in 144 (102 males and 42 females) out of the 401 cases of perinatal deaths, giving an autopsy rate of 35.9%. The birth weights of the autopsied cases ranged from 500 g to 3500 *g,* and their gestational ages ranged from 16 weeks to 40 weeks. The age at death of the neonates varied from a few hours to 25 days.

The major causes of death have been analyzed in *Table I.* Meconium aspiration, congenital malformations, hyaline membrane disease and infections accounted for the death in the majority of cases. In 13 cases (9%), after review of the clinical and pathological findings, no specific primary cause of death could be determined.

Associated autopsy findings detected in some of the cases included partial pulmonary atelectasis, peritonitis, pericardial effusion, microabscesses in the brain, renal infarction, adrenal hemorrhage and fatty change in the liver.

A total number of 52 congenital defects were detected in the autopsies studied and they were found to be the primary cause of death in 21 neonates (14.6%) in whom they involved the cardiovascular, urogenital, gastrointestinal or respiratory system, in that order of frequency.

It was found that the mortality rate was higher in preterm (< 37 weeks gestation) and low birth weight (< 2500 g) babies. Multiple pregnancies (twins and triplets) and maternal diseases like diabetes mellitus, severe anemia and eclampsia were associated with higher rates of fetal loss. A history of consanguinity was obtained in 5 cases (3.5%).

Discussion

In the present study, abnormalities in the respiratory system were the major findings accounting for the perinatal death in 62 cases (43%) and were associated autopsy findings in a good proportion of cases. Congenital malformations were detected in 21 cases (14.6%), the maximum number being in the cardiovascular and urogenital systems followed by the gastrointestinal system. Neonatal infections were found in 13 cases (9%). Findings quite similar to ours have been reported by other authors also(3-6).

The cause of death could not be ascertained in 13 cases (9%) in the present study. Other authors(6) report unexplained perinatal deaths in 7.5% of cases. In one study(5) it was observed that as many as 24.4% of cases had died due to uncertain causes. Some of the cases of unexplained death in our study were macerated stillbirths in whom it is frequently not possible to make adequate assessment of pathologic data due to advanced autolytic changes. Failure to determine the primary cause of death in the remaining cases indicates the limitation of autopsy in certain cases. In some of the cases, however, the possibility of sudden infant death syndrome, while in a few others, metabolic causes may be considered.

Perinatal asphyxia is a common cause of perinatal mortality(5-7) and the biologic risk factors involved are far too many(8). Unfortunately, ours being a retrospective analysis with inadequate availability of prenatal and intranatal records, no attempt has been made to provide accurate statistics regarding perinatal asphyxia.

In general, it was found that a large proportion of perinatal deaths were in preterm

TABLE I-*Primary Cause of Death Determined After Perinatal Autopsy.*

	Cause of death	Number	Percentage
A.	Respiratory system		
	1. Meconium aspiration	34	23.6
	2. Hyaline membrane disease	19	13.2
	3. Pulmonary hemorrhage	9	6.2
B.	Congenital malformations	21	14.6
C.	Infections		
	1. Bronchopneumonia	10	6.9
	2. Septicemia	2	1.4
	3. Necrotising enterocolitis	1	0.7
D.	Intracranial hemorrhage		
	1. Intraventricular	1	0.7
	2. Intracerebral	2	1.4
	3. Subdurdl	1	0.7
	4. Subarachnoid	1	0.7
E.	Hydrops fetalis	5	3.5
F.	Disseminated intravascular coagulation	2	1.4
G.	Twin-to-twin transfusion	4*	2.8*
H.	Extreme prematurity with no histological findings	15	10.4
I.	Maternal predisposing factors	4	2.8
J.	Uncertain causes	13	9.0
	Total	144	100.0

* This percentage appears high because in both the cases, the donor as well as the recipient twin had died.

and low birth weight babies as has also been described by others(7). It was also found that the mortality rate was higher in cases of twins and triplets and in the presence of maternal disease. Perinatal asphyxia must have been an important factor responsible for the death in all these high-risk cases and also in our cases of intraventricular hemorrhage and meconium aspiration. Our hospital, like other general hospitals, provides routine facilities for perinatal care and management of perinatal asphyxia. Serology, microbiology cultures and cytogenetic studies could not be done in all the cases due to the high costs involved in these procedures. Though it is not possible to claim 100% accuracy in our estimation of the cause of death, we have strived for maximum accuracy by correlating the autopsy and clinical findings and ascertaining that these put together were incompatible with life.

This retrospective autopsy study on a moderate sample which forms about a third of the perinatal deaths in this institution, though lacking in clinical correlation in all cases, gives an indication of the causes of perinatal mortality at our Institution in Bangalore. The fact that perinatal

autopsy provided conclusive information in our study as well as in other studies(4), shows the advantages of perinatal autopsies. The autopsy may be revived by educating the public and the medical profession about its values, structuring medical teaching around the autopsy, prescribing minimal autopsy requirements for hospital accreditation and providing financial support for autopsy. Measures to recognize, monitor and control all the perinatal risk factors would be helpful in reducing perinatal mortality.

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