Vital Statistics

Neonatal Morbidity and Mortality: Report of the National Neonatal-Perinatal Database

An accurate database is a necessity for planning and monitoring health care. In India, neonatal and perinatal data is scanty, largely institutional based and non-uniform in its reporting. Realizing these inadequacies, the National Neonatology Forum (NNF) created a national neonatal-perinatal database, which is a continuous reporting format, uniform in its definitions and are checked and compiled at a nodal center.

In this communication, the neonatal morbidity and mortality data from the database for the year 1995 is presented(1). The data was compiled from the intramural births of 16 centers. Two centers provided data for only part of the year; 4 and 6 months, respectively.

Perinatal and Neonatal Mortality

The database for the analysis comprised of 38,592 births of which 37,082 were live-born and 1510 were still-born. *Table I* provides the perinatal and neonatal mortality rates. The mortality rates are considerably higher than those reported in the SRS data(2). This may however be a reflection of a selection bias of the database population, which is comprised of a large proportion of high risk pregnancies referred to these institutions for special care.

TABLE I—*Perinatal and Neonatal Mortality Rates*

Perinatal mortality rate	71.6 per 1000 births
Stillbirth rate	39.1 per 1000 births
Neonatal mortality rate	37.7 per 1000 live births
Early neonatal mortality rate	33.8 per 1000 live births

Birth Weight and Survival

The incidence of low birth weight (LBW) was 32.8% and that of preterms 12.3%. Two-thirds (67.2%) of the LBW were term babies. The incidence of babies with birth weight <2000g was 10.2%, <1500 g was 3.3% and <1000 g was 0.7% *Fig. 1.* provides data on survival by birth weight groups. The survival amongst babies with birth weights >1500 g is generally more than 80%, suggesting that if adequate primary and secondary level neonatal care was available, one could achieve acceptable survival amongst LBW babies in the country.

Neonatal Morbidity

Tables II & III provides details of important neonatal morbidities. Since asphyxia and septicemia contribute to a bulk of the neonatal morbidity and mortality burden in this country, they merit a greater discussion.

Asphyxia

Apgar score analysis revealed that 2.9% and 0.8% neonates had scores between 0-3 at 1 and 5 minutes, respectively; 4.9% and 1.9% had scores between 4-6 at 1 and 5 minutes, respectively. Assisted ventilation by bag and mask was provided to 5.5% of babies with 3.2% requiring intubation in the delivery room. The above data suggests that amongst institutional births the incidence of birth asphyxia would approximate 5%. Only a quarter of

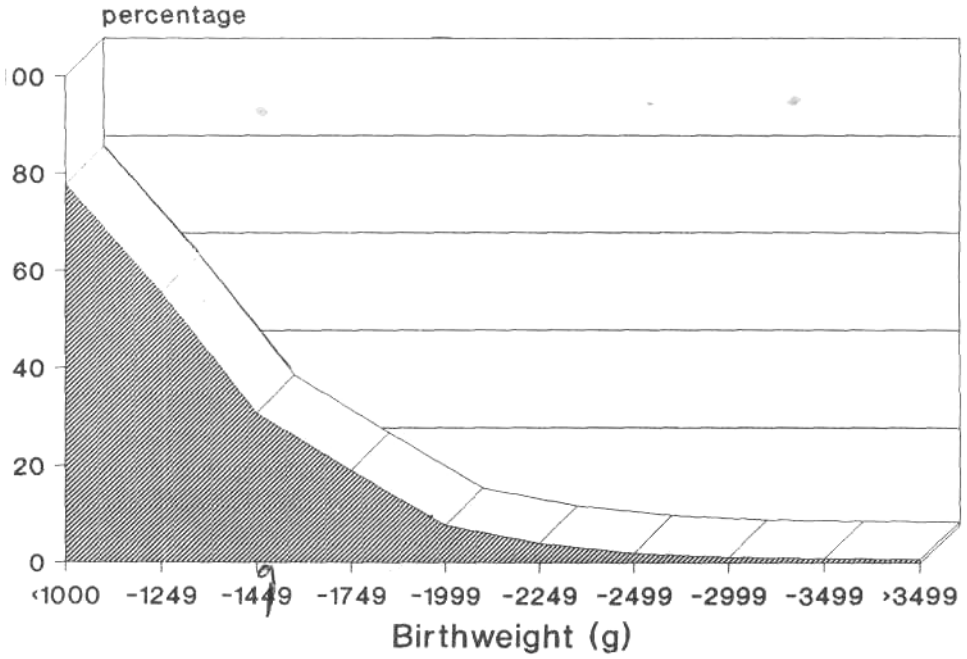

Fig. 1. Neonatal mortality in various birthweight groups.

these asphyxiated neonates manifested the clinical syndrome of hypoxic ischemic encephalopathy. Birth traumas such as fractures, nerve palsies or cranial bleeds occurred in < 1%, indicating deliveries by more trained personnel.

Septicemia

Septicemia was observed in 3.9% of intramural live births. Almost half (53.4%) had their onset <72 h and yielded a growth on culture (54.4%). In neonates with systemic infections, pneumonias comprised 24.2% of the infections, meningitis 8%, necrotising enterocolitis 5% and invasive diarrheas 2%. No case of neonatal tetanus was reported amongst these institutional births. *Fig. 2* provides the profile of organisms causing neonatal septicemias. *Klebsiella pneumoniae* sensitivity to genatamicin, amikacin, cefotaxime and ciprofloxacillin was 38.1%, 59.8%, 37% and 48.3% respectively. The sensitivity of *Escherichia coli* to the same antibiotics was 67.7%, 74.1%, 40.9% and 68.7%, respectively. Over 70% of the strains of *Staphylococcus aureus* were susceptible to gentamicin, amikacin, netilmicin, vancomycin and ciprofloxacillin.

Neonatal Mortality

Table IV lists the primary causes of neonatal mortality. It is evident that birth asphyxia, septicemia and causes related to immaturity (such as RDS and IVH), account for almost three-fourths of the neonatal deaths and a majority of which may be considered to be preventable.

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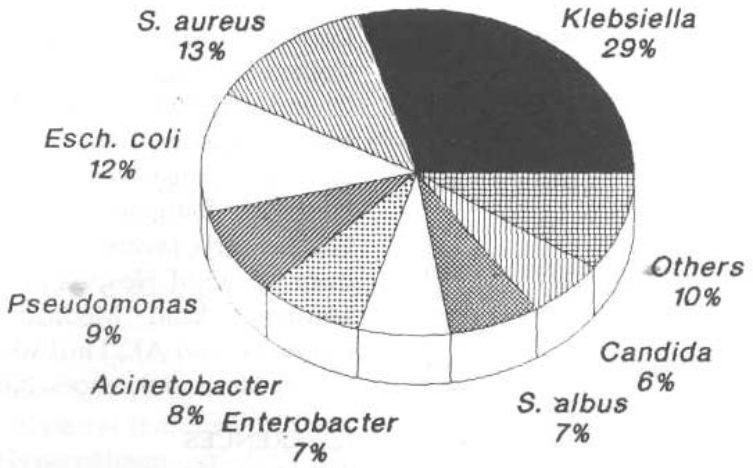

Fig. 2. Profile of organisms resulting in neonatal sepsis.

TABLE II– *Incidence of Neonatal Morbidities (n=37082)*

Diagnosis	n	(%)
Respiratory Distress		
Transient tachypnea	722	1.9
MAS	502	1.4
HMD	485	1.3
Pneumonia	343	0.9
Pneumothorax	70	0.2
Others	152	0.4
CNS disorders		
HIE	513	1.4
Seizures	466	1.3
Intraventricular hemorrhage	180	0.5
Intracranial bleed (other than IVH)	45	0.1
Others	91	0.2
Miscellaneous		
Jaundice (S. bilirubin <15 mg/dl)	1582	4.3
Hypothermia (core <35°C)	402	1.0
Apneic spells	443	1.2
Hypoglycemia	312	0.8
Hypocalcemia	106	0.3
Anemia	241	0.6
Polycythemia	203	0.5
Retinopathy of Prematurity	39	0.1

HIE - Hypoxic ischemic encephalopathy;
HMD - Hyaline membrane disease;
MAS - Meconium aspiration syndrome;
IVH - Intraventricular hemorrhage.
IVH - Intraventricular hemorrhage.

TABLE III– *Incidence of Neonatal Morbidities–Infections and malformations (n=37082)*

Diagnosis	n	(%)
Infections		
Systemic sepsis	1436	3.9
Septicemia	1104	3.7
Pneumonia	348	0.9
Meningitis	122	0.3
Necrotising enterocolitis	71	0.2
Infective diarrhea	30	0.1
Others	55	0.1
Malformations		
Limb defects	138	0.4
Cardiac defets	118	0.3
GIT defects	70	0.2
Genitourinary defects	65	0.2
Neural tube defects	59	0.1
Hydrocephalus	36	0.1
Cleft-lip/palate	49	0.1
Down's syndrome	32	0.1
Miscellaneous	279	0.7

TABLE IV— *Primary Causes of Neonatal Deaths (n=1400)*

Cause	n	(%)
Birth asphyxia	340	24.3
Birth trauma	22	1.6
Extreme prematurity	159	11.4
Hyaline membrane disease	187	13.5
Intraventricular hemorrhage	86	6.1
Septicemia /meningitis	270	19.3
Pneumonia	37	2.6
Malformations	134	9.6
Pulmonary hemorrhage	55	3.9
Miscellaneous	88	6.3
Not established	22	1.6

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