Perinatal Mortality in Patan Hospital

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Abstract

Introduction	Perinatal and neonatal mortality rates are sensitive indices to judge the state of health of a given population. The same rates also give an idea about the quality of services provided by a particular institution.
Objective	To calculate and compare Perinatal Mortality Rate (PMR) and Early Neonatal Mortality Rate (ENMR) and find out common causes of early neonatal mortality.
Methods	It was a retrospective, hospital-based study. Registered in the related departments of the hospital were studied. WHO definitions for PMR, ENMR, still birth, prematurity, Low Birth Weight (LBW) etc were applied.
Results	A total of 7,288 children were born in the 12-month period. One hundred ten were still born. Out of the 7,178 live-born babies, 70 died within 7 days of their life. Of the 180 perinatal deaths, 17 were born before 28 weeks of gestation or with a birth weight of less than 1000 gm. The PMR was 22.4/1000 total births and ENMR 8.8/1000 live births. Both these rates have decreased in PH over past 9 years. Seven percent of the newborns were preterm and 13% had low birth weight. Common causes of early neonatal death were prematurity related.
Conclusion	Common causes of early neonatal death were pre-maturity related. In previous studies also the same condition was found to be responsible for most number of neonatal deaths. To reduce neonatal mortality, efforts should be directed towards medico-social intervention to prevent premature births and advanced supportive care of those who do get delivered prematurely.
Keywords	Perinatal Mortality Rate, Neonatal Mortality Rate, Patan Hospital;

Introduction

Patan Hospital (PH) is one of the main hospitals of the Kathmandu valley, and indeed of the country, providing maternity and child health services. Perinatal and neonatal mortality rates are sensitive indices to judge the state of health of a given population. The same rates also give an idea about the quality of services provided by a particular institution. One way to improve these services is continuous monitoring in order to find strengths and weaknesses. Yearly audits/reports are a part of this process. This paper is a record and report of perinatal events of PH over a 12-month period from Magh 2058 to Paush 2059 (January to December 2002).

Objective

The main objectives of this study were:

- To calculate Perinatal Mortality Rate (PMR) and Early Neonatal Mortality Rate (ENMR) for the study period,
- To compare these rates with those of other hospitals of the valley as well as with the rates of PH in the past few years,
- To find out common causes of early neonatal mortality.

Materials and Methods

It was a retrospective, hospital-based study in which all deliveries conducted at PH during the study period were included. Registers in the Birthing Center, the Maternity Ward and in the two nurseries, and the files of dead newborns kept in the record section of the hospital were studied and analyzed. WHO definitions for

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PMR, ENMR, still birth, prematurity, Low Birth Weight (LBW) etc were applied. Means and percentages were used for statistical analysis.

Results

A total of 7,241 deliveries were conducted in the 12-month period at PH. Of these there were 47 sets of twins thereby making the total number of births 7,288. One hundred and ten of them were stillborn. Thus the total number of live births was 178. Out of these, 70 died within seven days of life. Table 1 shows the monthly distribution of these figures. Maximum number of births (671) were given in the month of Asoj and minimum (532) in Jeshtha. A comparison with two other hospitals of the valley shows that in terms of total number of deliveries PH (7,288) lies between the Maternity Hospital (MH) (15,980) and the TU Teaching Hospital (TUTH) (2,695)[1]. In PH itself this number has been steadily increasing over the years (056/57: 5,767; 057/58: 6,706; 058/59: 7,288)[2,3].

Table 1: Monthly break-up of deliveries and perinatal deaths

Months	Total deliveries	Twins	Total births	Still births	Total live births	ENND
Magh						
058	653	1	654	5	649	5
Falgun	605	4	609	4	605	8
Chaitra	597	6	603	10	593	5
Baishakh						
059	556	2	558	7	551	1
Jestha	530	2	532	6	526	8
Asar	575	7	582	10	572	4
Shrawan	597	3	600	10	590	6
Bhadra	632	2	634	8	626	3
Asoj	664	7	671	13	658	9
Kartik	550	5	555	13	542	6
Mansir	632	3	635	11	624	7
Paush	650	5	655	13	642	8
Total	**7,241**	**47**	**7,288**	**110**	**7,178**	**70**

Early Neonatal Mortality

As mentioned earlier out of 7,178 live births 70 neonates died within seven days of life. The Early Neonatal Mortality Rate (ENMR) was thus 9.8 per thousand live births. Seven of these neonates were born either earlier than 28 weeks of gestation or were lighter than 1000 grams. Therefore, the corrected ENMR was 8.8 per thousand live births. This rate has fallen from 12.3 in 2051 and has now reached almost a plateau. It may be mentioned here that the latest national figure for NMR is 38.6[1]. In comparison the MH and the TUTH have the NMR of 12.9 and 11.5 respectively[1].

Perinatal Mortality

Out of 7,288 total births there were 180 deaths in the perinatal period (110 stillbirths and 70 early neonatal deaths) thereby giving a Perinatal Mortality Rate (PMR) of 24.7 per thousand total births. Of the 180 deaths 10 were those who were born before 28 weeks of gestation and 7 with a birth weight of less than 1,000 grams. The corrected PMR was therefore 22.4. A comparison of this figure over past few years at PH shows that after a fall from 25.8 in 2051 it has become almost constant now (051: 25.8; 053: 22.6; 056-58: 21.2; this study: 22.4)[2,3]. The PMR of TUTH is comparable (24.4)[1] whereas that of the MH is the highest (35.4)[1].

Prematurity and Low Birth Weight (LBW)

Of the 7,288 births 6,759 (93%) were full term and 529 (7%) preterm. Of the latter group an overwhelming majority (498; 94%) were born between 28 and 36 weeks of gestation and the remainder (31; 6%) earlier than 28 weeks.

The average weight of all newborns was 2940 grams, which was only slightly less than that of those born at full term (2990 grams). Nine hundred and seventy-four (13%) were LBW (<2500 grams) and 81 (1%) large for date (≥4000 g). The big majority (86%) thus had normal birth weight. The proportion of babies with a LBW has been steadily declining over last few years at PH (050: 28.8%; 051: 18.5%; 053: 15.6%; 56-57: 15.4%; this study: 13)[3]. The LBW rate in the TUTH is almost equal (14%) to that in this study but it is almost double in the MH (28%)[1]. Of the LBW babies, 3% were *extremely* LBW (<1,000g) and 6% very LBW (1,000-1,499 g). The remainder (91%) were *just* LBW (1500-2499 g).

Perinatal Deaths in Relation to Gestational Age & Birth Weight

The ENMR and the PMR in relation to the gestational age at birth is shown in Table 2 and in relation to the birth weight in Table 3. It is evident that these rates decrease with the maturity of the fetus. There is a very significant fall in these figures once the fetus reaches 31 weeks of gestation indicating a marked rise in chances of survival once this age is reached in the intrauterine life. Another significant difference can be noted at term where the ENMR is 4 and PMR 12 compared to 58 and 121 respectively only one row above. This shows that a significantly higher proportion of babies can be expected to survive if they are delivered at term.

Table 2: Perinatal deaths in relation to gestational age

Gest. age (wks)	Total births	ENND	SB	ENMR	PMR
≤28	16	8	0	500	500
29-30	49	10	12	270	449
31-32	58	4	10	**83**	**241**
33-34	101	4	13	45	168
35-36	313	17	21	58	121
≥37	6,751	27	54	**4**	**12**

LBW contributes to a large proportion of perinatal deaths and that these rates can be reduced by increasing the birth weight. A significant positive change can be noticed at 1500 g indicating a fairly better chance of survival if a baby is born with this weight. The table also indicates that a birth weight of 4 kg or more slightly increases the risk of death in the perinatal period. (Table 3)

Table 3: Perinatal deaths in relation to birth weight

B. Wt (gm)	Total births	Still births	Live births	ENND	ENMR	PMR
<1000	25	14	11	7	636	840
1000-1499	57	16	41	14	341	526
1500-2499	892	42	850	27	**32**	77
2500-3999	6,233	38	6,195	20	3	9
≥4000	81	0	81	2	25	25

Causes of Neonatal Death

The following were the causes of neonatal death:

Common causes	
RDS	24
Cong. anomaly	14
Sepsis	6
Birth asphyxia	6
MAS	5

Other Causes	
Pneumothorax	4
Hydrops fetalis	3
Unknown	3
Pneumonia	2
Others	3

It is clear from the above that RDS caused deaths in more than one-third (34%) of the cases. Considering that prematurity leads to RDS as well as to the risks of infections like sepsis and pneumonia it can be safely concluded that perinatal deaths can be significantly reduced by preventing preterm deliveries and by measures such as CPAP, ventilatory support and surfactant to newborns with immature lungs.

In a previous study also done at PH two years ago RDS was found to be the number one killer[2]. In that study sepsis (at number two) was more prevalent than congenital anomaly, which was at number four. Pneumonia is not significant in this study. It is 9th in the list causing only 2(3%) deaths in contrast to the findings in the previous report where this condition occupied number three position as a cause of neonatal death. A comparison with the other two hospitals of the valley is given in Table 4. It can be seen that RDS is important cause of death in the other two hospitals also occupying number 2 position in TUTH and number 3 in the MH. Neonatal sepsis was the number one killer in the TUTH and perinatal asphyixia occupied the same position in the MH.

Table 4: Causes of early neonatal deaths in three hospitals of the Kathmandu valley

Condition	PH	MH	TUTH
HMD	I	III	II
C. Anomaly	II	IV	III
NNS	III	V	I
P. Asphyxia	IV	I	V

Nursery Admission

PH has two nurseries where more tiny and sicker babies requiring closer observation are admitted. One of these is for 'clean' babies and the other for 'septic' ones. During the study period a total of 447 (6% of total live births) were admitted into this facility. As shown in the boxes below the most common cause for admission was PT/LBW/IUGR (28%). If the number of cases with RDS are added to this it will be obvious that at least 34% of all nursery admissions are prematurity related. Infections (sepsis, pneumonia, meningitis) were responsible for 28% of admissions. Considering the fact that premature newborns are more prone to develop infections it can be safely assumed that at least half of the nursery admissions are due, directly or indirectly, to pre-maturity.

Common causes:

PT/LBW/IUGR:	126
Sepsis:	70
Pneumonia:	55
MAS:	46
Observation:	44
HMD:	28
Cong anomaly:	20
Birth asphyxia:	21

Other causes:

Hypoglycemia:	12
Hyperbilirubinemia:	6
Birth trauma:	5
Rh incompatibility:	3
Pneumothorax:	3
Meningitis:	2
Others:	6

Congenital Anomalies

A total of 20 children were born with identifiable congenital anomaly at birth during the study period. Diaphragmatic hernia and cleft lip were the most common affecting 3 newborns each as shown in the boxes below. The figures in parentheses indicate number of children with that particular anomaly.

Diaph hernia	(3)
Cleft lip	(3)
Hydrocephalus	(2)
Multiple	(2)
Lung dysplasia	(1)
Hypospadias	(1)
Treacher Collins syndrome	(1)

Anencephaly	(1)
Wide cisterna magna	(1)
Esophageal atresia	(1)
Renal mass	(1)
Intestinal obstruction	(1)
Meckel Gruber syndrome	(1)
Laryngomalacia	(1)

Summary and Conclusion

A total of 7,288 children were born in PH in the last 12 months of the study period. One hundred and ten of these were still born. Out of the 7,178 neonates who were born alive, 70 died within 7 days of their life. Of the 180 perinatal deaths, 17 were borne either before 28 weeks of gestation or with a birth weight of less than 1000 gm. The PMR, thus, was 22.4/1000 total births and ENMR 8.8/1000 live births. Both these rates have steadily decreased in PH over past 9 years, now reaching almost a plateau. Seven percent of the newborns were preterm and 13% had low birth weight. Common causes of early neonatal death were prematurity related. In previous studies also the same condition was found to be responsible for most number of neonatal deaths.

Limitations of the study

Being a hospital based study it does not reflect the community situation. Neonates were not followed up for 7 complete days after birth as all healthy ones were discharged early. So, the figures for both PMR and ENMR can only be partly correct.

Recommendations

- To further reduce neonatal mortality, efforts should be directed towards medicosocial intervention to reduce premature births and advanced supportive care of those who do get delivered prematurely.
- CPAP, surfactant and ventilators can go a long way in preventing many of these untimely deaths.

References

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