Status of Perinatal Mortality in Karnali Academy of Health Sciences, Jumla Nepal

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ABSTRACT

Introduction: Perinatal mortality rate is a sensitive indicator of the quality of obstetric and pediatric health services. It also helps us to evaluate the efficiency of health care provided by a particular hospital. The aim of this study was to evaluate the cause of perinatal death in a tertiary care medical centre, which may help to reduce the incidence of perinatal death and improve the quality of care.

Methods: The two-year retrospective study of perinatal deaths was done at Karnali Academy of Health Sciences (KAHS), Jumla from March 2017 to April 2019. Data was collected from monthly perinatal audit and annual mortality reviews. Registers in the maternity ward, sick Neonate Care Unit, and files of dead newborns kept in the record section of the hospital were studied and reviewed.

Results: A total of 1354 deliveries were conducted in the 24 months period at KAHS with a perinatal mortality rate of 36.08 per 1000 birth and early neonatal death rate of 12.8 per 1000 live birth. The Perinatal mortality was higher in low birth weight and premature baby. The cause of stillbirth and early Neonatal death were identified. Most of the early neonatal death was due to Prematurity (41.17%) followed by Birth Asphyxia and Neonatal Sepsis.

Conclusion: Prematurity and its related complication were the most common cause of early neonatal death followed by birth Asphyxia and Neonatal Sepsis. There is a need to improve antenatal, early identification of high-risk pregnancy as well as Neonatal Intensive Care Unit (NICU) to further reduce deaths due to prematurity and birth asphyxia.

Keywords: Perinatal Mortality Rate; Early Neonatal Mortality Rate; Rural Areas; Jumla

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INTRODUCTION

The perinatal death includes the death of a baby from 28 weeks of gestation to first seven days of life.[1] The term Perinatal mortality encompasses both late fetal deaths and early neonatal deaths. It is the key indicator for newborn care and directly reflects prenatal, intrapartum and neonatal care. This rate also gives an idea about the quality of obstetric and pediatric care provided by a particular hos-pital. Karnali Academy of Health Sciences (KAHS) is located in Jumla district, is one and the only hospital with tertiary care facility in a rural area of Nepal, providing maternity and child health.

Globally, approximately 5.9 million perinatal deaths occur annually, of which 3.2 million stillbirths (SB) and 2.7 million Early Neonatal Deaths (END). The highest burden of perinatal deaths is in developing countries.[1] Sustainable development goal 3 (SDG 3) targets at ensuring healthy lives and promoting well-being for all at all ages. By 2030, the target is to end preventable deaths of new-borns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-five mortality to at least as low as 25 per 1000 live births.[2] Nepal has a high Neonatal Mortality Rate (NMR) of 20.6 per 1000 live birth. Although NMR has fallen from 54.2 per 1000 live birth in 1991 to 20.6 per 1000 live birth in 2015.[3,4] Two third of newborn death occurs in the first week of life.

Thus, this study was carried out to evaluate the causes of perinatal deaths and evaluate the avoidable factors in a tertiary care centre of rural Nepal so that the preventable root causes are analyzed and recommendations could be made which will help in reducing the perinatal mortality as well as improve the standard of care of the hospital.

METHODS

This two-year retrospective study was conducted in the Neonatal Unit of Karnali Academy of Health Science, Jumla from 15 March 2017 to 15th Aril 2019. KAHS has 8 bedded Neonatal Unit with 4 phototherapy units, radiant warmer & an Incubator. Data was collected from monthly perinatal audit and annual mortality reviews. Registers in the maternity ward, sick Neonate Care Unit, and files of dead newborns kept in the record section of the hospital were studied and reviewed. The PMR (Perinatal Mortality Rate) was calculated as the total number of stillbirths plus early neonatal deaths (within 7 days of birth) per thousand births. Similarly, Early Neonatal Mortality Rate (ENMR) was calculated as the deaths of neonates within 7 days of life per thousand live births.

The birth before 28 weeks and weight less than 1000gm of the fetus were excluded. Major inclusion criteria were stillborn babies with gestational age >28 weeks or weight >1000 grams and early neonatal deaths i.e., till 7 days of life were included in this study. WHO definition for PMR, ENMR, stillbirth, prematurity and low birth weight (LBW) were used. Data were entered and statistical analysis carried out using MS excel.

RESULTS

A total of 1354 deliveries were conducted in the 24 months period at KAHS, among which 87.1 % 1180 was spontaneous vaginal delivery, lower (uterine) segment caesarean section (LSCS) rate was 11.52% (156). There were 4 sets of twins thereby making the total number of births 1358. 1.32% (18) cases had instrumental delivery. There was 32 stillbirth (23.56 per 1000 birth) and 19 early neo-natal deaths (14.32 per 1000 live birth). Thus, the total number of live births was 1326. 2 of them were early neonatal death before 28 weeks or lighter than 1000gm. So, making corrected early Neo-natal Mortality Rate as 12.8 per 1000 live birth. The perinatal mortality rate was 36.08 per 1000 total birth (Table 1). The mortality statistics and mortality indicators are described in Table 3 and Table 4.

Table 1: Number of Birth, Perinatal rate and Mortality Rate in two years

Statistics	Total
Total Birth	1354
Total Live Birth	1326
Stillbirth	34
Total Stillbirth excluding <1000gm	32
Early Neonatal Death	17
Perinatal Death	49
Extended Perinatal death	53
Stillbirth Rate (per 1000 birth)	23.56
Early Neonatal Death (per 1000 live birth)	12.8
Perinatal Mortality Rate (per 1000 live birth)	36.08
Extended Perinatal mortality rate (per 1000 live birth)	32.6

Table 2: The Relation of Perinatal Death to Birth Weight

Weight (gm)	Stillbirth	Early Neonatal Death	Deliveries	Perinatal Mortality Rate
1000 - 1500	5	7	19	631.5
1600 - 2000	2	2	20	200
2100 - 2500	14	4	103	174.7
2600 +	11	4	1216	12.3
Total	**32**	**17**	**1358**	**36.08**

The relationship between birth weight and PMR is shown in Table 2. The increased mortality risk of preterm and low birth weight was demonstrated in this study. There was no survival of babies with birth weight less than 1000gm and lowest early neonatal death rate in babies weighing more than 2500gm shown in Table 2.

Malpresentation and Cord prolapse, Congenital Anomalies and Birth Asphyxia were the most common obstetric cause of perinatal deaths. In 13 cases, no cause could be found, all these cases were intrauterine deaths and macerated stillbirth. The total stillbirths were 32 among which 9 were fresh and 23 (71.8%) were macerated. The causes are shown in Table 3.

Table 3: Causes of Stillbirth

Cord Prolapse	3 (9.37 %)
Gross Congenital Anomalies	3 (9.37%)
Birth Asphyxia	3 (9.37%)
Malpresentation	7 (21.90%)
Abruption Placenta	2 (6.25%)
Placenta Previa	1 (3.12%)
Unknown	13 (40.62%)
Total	**32 (100%)**

Table 4: Causes of Early Neonatal Death (%)

Prematurity and its complications	7 (41.18%)
Birth Asphyxia	4 (23.52%)
Neonatal Sepsis	4 (23.52%)
Multiple Congenital Anomaly	2 (11.77%)
Total	**17 (100%)**

Prematurity and its complications were most commonly associated with early NND followed by multiple congenital anomaly.

DISCUSSION

In our present study among 1354 deliveries with a perinatal mortality rate of 36.08 per 1000 birth and early neonatal mortality rate of 12.8 per 1000 live birth. This rate is high as compared to a developed country like Japan. The perinatal mortality rate in Asia is 47 per 1000 total births, with a peak of 30 per 1000 in South-east Asia along with ENMR of 23 per 1000 live births. So, in our study, PMR and ENMR seems to be lower than the South Asian average.[5] Published results in different centres across the Nepal showed wide variations in PMR ranging from 19 per 1000 to 48 per 1000 birth in kathmandu valley, while in rural areas ranges from 42 per 1000 to 96 per 1000.[1,5,8-12,19-21]

In a study by Srivastava et al.[6] done in India out of total 2691 deliveries, there were 184 perinatal deaths with a perinatal mortality rate was 68.37 per 1000 birth. Similar to our study majority of perinatal deaths (54.3%) occurred due to preterm low birth weight with or without associated other factors, 8.6% due to congenital anomalies, more than 38% perinatal death due to maternal factor antepartum hemorrhage, eclampsia, obstructed labor, malpresentation, medical problem in pregnancy.

In Nepal, the main causes of neonatal deaths in 2015 were prematurity (30.8 %), birth asphyxia and trauma (23.4 %) and Sepsis (18.4 %)[7] similiar to our study. Prevention of premature delivery, proper management of low birth weight babies and management of sepsis and perinatal hypoxia have become important interventional strategies in reducing early neonatal deaths in KAHS.

In the study of Bajracharya et al.[8] out of total 1275 deliveries, there were 21 perinatal deaths including three intrauterine fetal deaths, one still birth and seven early neonatal deaths. The perinatal mortality rate was 16.27 per 1000 birth. Majority of perinatal deaths (19%) occurred due to congenital anomalies followed by (14%) hypertensive disorder in pregnancy, intrapartum hypoxia (14%), unexplained causes (14%), 9.5% cord prolapse, antepartum haemorrhage (9.5%), 5% due to intrauterine growth restriction, gestational diabetes mellitus or preterm labour. Delay to seek health care and inadequate antenatal checkups were the most common avoidable factors.

In our study, most of the early neonatal death was due to Prematurity (41.17%) followed by Birth Asphyxia and Neonatal Sepsis. In a similar studies[9,10,16,19,20] preterm babies and low birth weight babies contributed more to early neonatal and perinatal deaths followed by birth asphyxia, congenital anomalies, and septicemia.[14-17] Among 156 cases with the perinatal mortality of 72.4% and early neonatal mortality was 36.18 per 1000 live births. A similar study done in Kathmandu medical College[10] showed ENMR of 6.1 per 1000 live birth which is lower than our study which is probably due to lack of Neonatal Intensive Care Unit with ventilator support in our hospital and inaccessible health care in Jumla. Birth asphyxia is the second most common cause of neonatal death. Proper monitoring during labour and timely intervention by obstetrician during prolong labour and fetal distress will decrease its incidence. To decrease sepsis proper hand washing by all staffs and visitors should be strictly followed in sick neonate Unit.

In Dali et al.[11] out of 1531 total births, 38 were stillborn and 7 were early neonatal deaths. The perinatal mortality rate was 29.4 and the extended perinatal mortality rate was 32.6 per 1000 births. The rate of premature delivery was 8.4% (127 cases), among them PMR was 173.2 per 1000 births which is very high as compared to term babies i.e. 16.5. In extremely premature babies PMR was highest. Similar to our study, this study also showed perinatal death rate gradually decreases with increasing birth weight.

In Geetha et al.[12] multicenter study done with perinatal mortality rate was 48 and 23.7 per 1000 births in hospital as compared to rural settings were 96.2 and 42.5 per 1000 births. Similar to our studies, perinatal asphyxia, low birth weight and infection were the three most common causes of Early Neonatal mortality.

The perinatal mortality rate of Jumla in this study was found to 96.2 per 1000 births which are higher than in our study. However, that study was conducted in a community setting in contrast to hospital settings in our study.

In study done by Manandhar et al.[13] ENMR was 19 per 1000 live with and PMR of 81 per 1000 live birth. The cause of early neonatal death was birth asphyxia followed by complications of prematurity and meconium aspiration[13,16], unlike in our study prematurity is the most common cause. It might be due to lack of neonatal intensive care service in KAHS. In study done in rural India early neonatal death were due to birth asphyxia and preterm birth followed by sepsis.[18]

In two third of fetal deaths, identifiable cause is found [6,11]stillbirth due to malpresentation 14.2% and 6.12% each of cord prolapse and birth asphyxia were found. Gross congenital anomalies were found in 3 cases of stillbirth, this finding is similar to study done Dali et al.[11] Among these two of the cases were Anencephaly so proper counselling for folic acid supplementation before and during pregnancy has to be advocated. Early identification of risk factors and appropriate intervention is important to bring down perinatal mortality. Approximately one-third of fetal deaths remain unexplained similiar to studies done in Iran by Ghgorat et al.[14] and Nepal.[11,20,21] Prevention of premature delivery, proper management of low birth weight babies and management of Sepsis and Perinatal hypoxia have become important interventional strategies in reducing early neonatal deaths in KAHS.

The limitations of this study are as this is a hospital based study it doesn't reflect the community situation. Some of the neonates were referred early due to lack of ventilators and Neonatal intensive care Unit in Jumla. So, early neonatal death and Perinatal deaths are not truly reflected. Maternal factors associated with perinatal mortality has not been included in our study.

CONCLUSION

Prematurity and its related complication were the most common cause of early neonatal death followed by birth asphyxia and neonatal Sepsis. Early identification of high-risk pregnancy through proper antenatal screening, educating pregnant women to identify danger signs of pregnancy, creating public awareness about the importance of antenatal checkups, vigilant labor monitoring for fetal distress is recommended to reduce some categories of deaths. Further, neonatal Intensive Care Unit with ventilator support, surfactant, and parenteral nutrition is a must in decreasing neonatal deaths.

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