

Research Article

A Study on Occurrence of Perinatal Mortality and it's Contributing Factors Among Late Fetus and Early Neonates of Selected Rural Community, West Bengal

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A B S T R A C T

Introduction: Perinatal mortality rate (PMR) is taken as one of the indicators of the health status of a given society. A descriptive study was carried out on the occurrence of perinatal mortality and its contributing factors among late foetuses and early neonates of a selected rural community in West Bengal.

Objective: The objectives of the study were to determine the occurrence of perinatal mortality and to identify the factors contributing to perinatal mortality. Conceptual framework: The conceptual framework adopted for the study was based on the "Fishbone Model".

Materials and Methods: A total number of one hundred and fifty-six perinatal deaths were selected by using the non-probability purposive sampling technique. A validated and reliability-tested record analysis proforma was used for collecting the data. Obtained data were analysed by using descriptive statistics in terms of frequency and percentage.

Results: The study finding revealed that the occurrence of perinatal mortality was 7.35/1000 live births. Maternal contributing factors during pregnancy were anaemia (17%), obstetric complications (14%) and malnutrition (3%). 21% of mothers were having intra-natal complications like prolonged labour (4%), placental complications (4%), PROM 4% and others (9%). The major contributing foetal factors were prematurity (47.89%), asphyxia (41%), and low birth weight (<2500 gm) (68.59%).

Conclusion: The study has implications in the fields of nursing practice, nursing education, nursing administration and nursing research. A similar study can be replicated with a large sample in another setting with autopsy reports.

Keywords: Occurrence, Perinatal Mortality, Perinatal Mortality Rate, Contributing Factors

Introduction

The World Health Organization (WHO) defines perinatal mortality for developing countries as neonatal deaths of less than seven days of age and foetal deaths after 28 weeks of gestation. Perinatal mortality rate (PMR) is taken as one of the indicators of the health status of a given society. It is multifactorial in aetiology and depends on the quality of health care provided to the pregnant women and their babies in 2010. Perinatal deaths are responsible for about 7% of the total global burden of disease. Preterm birth, infections and birth asphyxia are thought to be the main cause of death in newborn babies worldwide. Each year more than 3 million stillbirths and early neonatal deaths (newborn deaths within the first 7 days of life) occur worldwide. It is the highest proportion of deaths among children (0-14). Over 98% of these perinatal deaths occur in low- and middle-income countries, with more than 70% occurring in community settings. The rate of maternal complications in macerated still births, fresh still births and early neonatal deaths were 50.4%, 50.7% and 25.8%, respectively. Maternal hypertension and obstetric haemorrhage were more likely in still births. The main causes of neonatal death were related to immaturity (48.7%) and hypoxia (40.6%). 173 (25.2%) of all late perineal deaths had a birth weight less than the 10th centile of gestational age.

Perinatal Mortality Rates and Still Birth Rates by residence, India and bigger states/UTs, 2015

Figure -1 depicts that the highest Early Neonatal Mortality Rate was in Uttarakhand 39 and the lowest in Kerala (9) out of 22 states in India. Odisha had the 2nd rank in ENMR with 33 per 1000 live births, and Chhattisgarh was in third position with 26 in the year 2015.

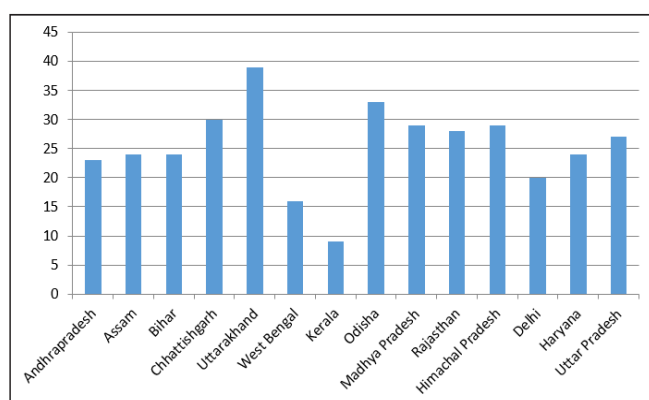


Figure 1. Bar diagram showing the perinatal mortality rate in India

In the Indian scenario, by the respect of the Sample Registration System 2015, the ENMR of India was 23 per 1000 live births. In rural areas the ENMR was 26 per 1000 live births, whereas in urban areas it was only 15. In the

West Bengal scenario, the early neonatal mortality rate was 16 per 1000 live births, and it stands in the 14th rank from the lower range of ENMR in India as per SRS-2015. In respect of rural and urban ENMR, the rural areas contribute 17 and urban areas share 13 per 1000 live births as per Health on March 2015. Still at present the ENMR is not decreasing significantly in our state. Low socio-economic status, poor nutrition of the mother, maternal complications, poor knowledge regarding maternal health, and improper utilisation of health services are the important components in reducing perinatal mortality.

Objectives of the study

- To determine the occurrence of perinatal mortality in the rural community.
- To identify the factors contributing to perinatal mortality.

Conceptual Framework

The conceptual framework of the present study is based on the Fishbone Model developed by Dr Kaoru Ishikawa. It is also called a cause-and-effect diagram or an Ishikawa diagram. It is a simple root cause analysis tool.

Perinatal Mortality

Materials and Methods

This was a retrospective survey. The study was conducted in a rural community of the district of North 24 Parganas, West Bengal. 5 blocks were selected. These are Deganga block, Bagdah block, Bongaon block, Barasat I block and Ghaighata block. In the present study, the population comprised all the babies who were delivered between November 2016 and October 2017 in District North 24 Parganas. The study population comprised all the babies who were delivered between November 2016 and October 2017 in District North 24 Parganas, including all deaths of foetuses after 28 weeks of gestation and deaths of neonates within 7 days. The Institutional Ethics Committee clearance certificate was obtained prior to the study. The sample size for this study was 21225, which was the total number of babies delivered in 5 selected blocks, including stillbirth, according to inclusion criteria. Inclusion criteria were babies delivered in the selected blocks only, whose death had been recorded in the selected blocks, who were delivered in between a particular time period (last 12 months). A non-probability purposive sampling technique was used to select the sample.

Table: 1 Data Collection Tools and Techniques Used for Assessing Demographic Profile and Contributing Factors of Perinatal Mortality

The prepared record analysis proforma, along with the guide sheet and criteria checklist, including the requesting letter, was submitted to nine experts. The experts were chosen

on the basis of their critical expertise from different units, and their opinions and suggestions were incorporated. Reliability of the tool was established by the inter-rater assessment method. The percentage of agreement between

two raters was 90, indicating that the tool was found to be reliable. Frequency percentage was adopted for analysis of the data. Analysis and interpretation of the data would be done on the basis of the stated objective of the study.

Table I.Data collection Tools and Technique

Tool no	Name of the tools	Variables to be measured	Techniques
I	Record Analysis Proforma	Demographic profile	Record
II	Record Analysis Proforma	Contributing factors of perinatal mortality	Record

Results

Table-2 No of Perinatal death cases at the selected blocks of rural community of North 24 Pargana's district from November 2016 to October 2017.

Data presented in the table 2 depicts that total number of live birth was 21225 and the total number of perinatal death were 156 (still born were 14 and early neonatal death were 142).

So the occurrence of perinatal mortality rate (according to operational definition) is = 7.35 / 1000 live births.

Section II : Findings related to the distribution of demographic characteristics of mothers

The data presents in figure 4 shows that majority of the mother (58.33%) were in the age group of 18-22 years, 28.21% were in age group of 23-27 years, 8.33% were in age group of 28-32 years and 5.13% were in age group of >32 years.

Pie diagram shown in figure 5 that most of the mothers (53.84%) were primi gravida, 28.84% mothers were 2nd gravida, 13.46% mothers belongs to 3rd gravida and 3.84% mothers were 4th gravida.

Table 3 Frequency and percentage distribution by education of mother and occupation of father and mother

The table indicates that majority of mothers (60.90%) were secondarily educated. 19.87% mothers had education upto primary and 14.74% mothers had higher secondary level and 4.49% were illiterate.

Data presented in table 2 depicts that most of the fathers (76.28%) belonged to daily wage labour, 20.51% fathers were business man and 3.21% father were service holder.

The table also shows that (95.51%) all the mothers were house wives. 4.49% mothers were daily labour.

The data depicts that (64.74%) mothers years of marriage was 1-5yrs , 22.43% mothers 6-10yrs of marriage, 9.61% mothers 11-15yrs and 1.92% mothers >15yrs of marriage.

Table 2.Distribution of Perinatal Mortality Cases in Selected Rural Community Blocks

Rural Community	Total live birth	Total perinatal mortality
Bongaon block	5246	40
Deganga block	4750	34
Bagdah block	3322	32
Gaighata block	3276	26
Barasat- 1 block	4631	24
Total	21225	156

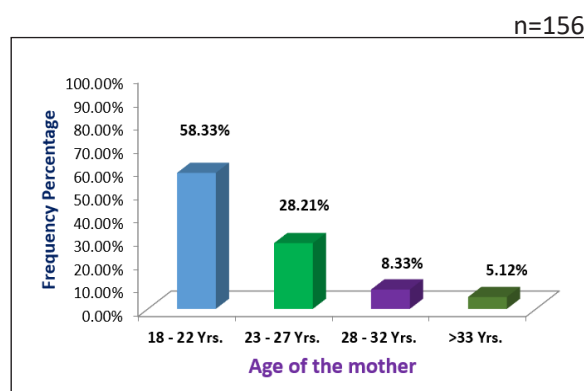


Figure 2.Bar diagram showing the percentage distribution of age of the mother

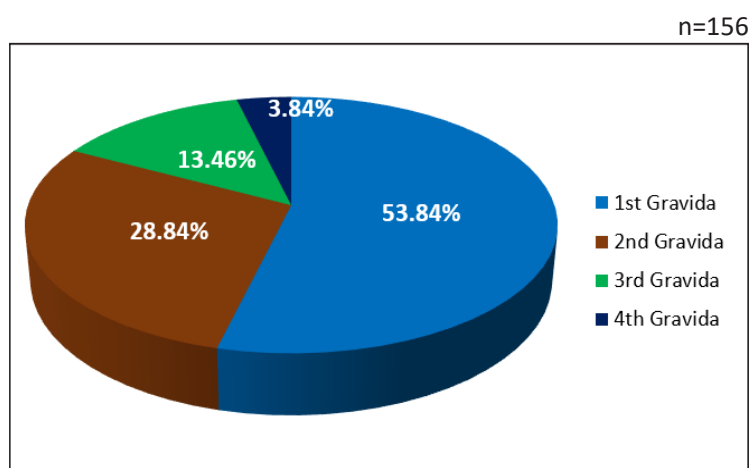


Figure 3. Pie Diagram showing the percentage distribution of parity of mother of demised

Table 3. Frequency and Percentage Distribution of Mothers' Education and Parents' Occupation

n=156

Characteristics	Frequency	Percentage (%)
Mother's Education		
Illiterate	7	4.49
Primary	31	19.87
Secondary	95	60.90
Higher secondary	23	14.74
Occupation of the father		
Daily wage labour	119	n=156 76.28
Business	32	20.51
Service	5	3.21
Occupation of the mothers		
Housewife	149	95.51
Daily Labour	7	4.49

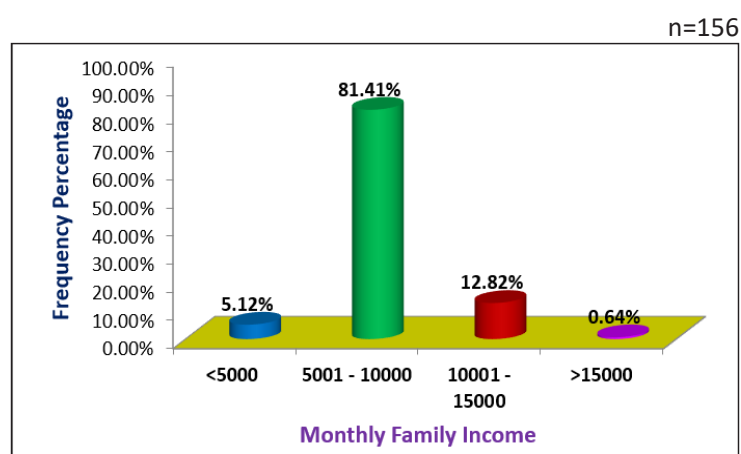


Figure 4. Bar Diagram showing the percentage distribution of monthly family income Data represents that majority of (81.41%) samples monthly family income belongs to Rs.5001-10,000 Rs, 12.84 % mothers belongs to Rs, 10001-15000 monthly income group, 5.12% were belongs to Rs, <5000 and less number 0.64% of mothers had monthly income above 15000

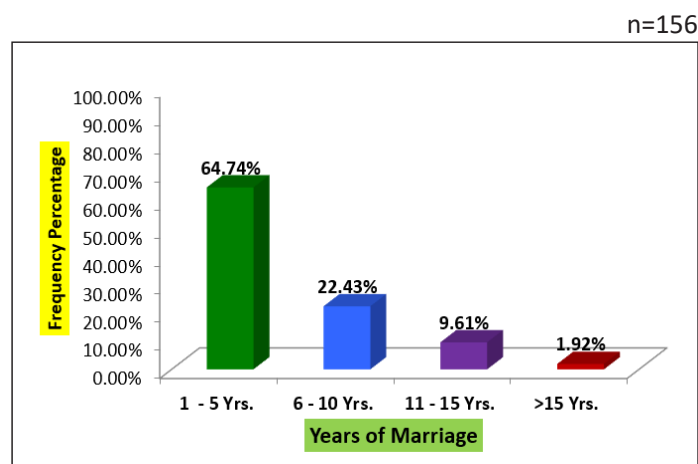


Figure 5. Pie Diagram showing the percentage distribution of years of marriage of mother

Table 4 Frequency and percentage distribution of contributing factors related to perinatal mortality

The table shows that maximum (47.89%) babies died within <24 hrs, 32.39% babies died within 4-7 days and 19.72% babies died within 1-3 days.

Section III : Finding related to the distribution of selected contributing factors

The table indicates that most of mothers (66%) did not suffer from maternal complications whereas 34% mothers had complained complications during antenatal period. Among them 17% mothers had suffered from anaemia, 14% mothers had obstetric complications and 3% mothers had malnutrition.

Table 5 Frequency and percentage distribution of contributing factors related to perinatal mortality.

Data also depicts that majority of mothers (41.67%) mode of delivery were normal delivery and 40.38% normal delivery with episiotomy and 17.95% mode of delivery was caesarean section .

Table 6 Frequency and percentage distribution of contributing factors related to perinatal mortality

This table shows that maximum (91.03%) delivery was single delivery whereas 8.97% delivery was multiple no.of fetus.

The table also reveals that among 156 mothers 79% had no maternal complications during labour whereas 21% mothers had complained during labour. Among the complained mother 9% had others complications, 4% mothers had suffered from prolonged labour, premature rupture of membrane and placental complications.

Bar diagram shows in figure 10 depicts that majority of the newborns (41%) born grossly asphyxiated, 29.49% newborns born normal and 20.51% newborns born asphyxiated.

Table 7 Frequency and percentage distribution of contributing factors related to perinatal mortality

Data presents that majority (68.59%) of babies birth weight were <2500gm whereas 31.41% babies birth weight were >2500gm.

The table shows that maximum (60.90%) babies were boy and 39.10% babies were girl.

Table also depicts that most of the babies (69.23%) were born premature and 30.77% babies were born mature during delivery.

Table 8 Frequency and percentage distribution of contributing factors related to perinatal mortality

The table represents that majority (42.31%) newborns died due to prematurity and birth asphyxia, 26.28% newborns were due to prematurity and low birth weight, 20.51% were due to congenital deformity and 16.02% were due to others causes.

The table also depicts that most of the babies (96.79%) died at hospital and few no of babies (3.21%) place of death was at home.

Table 9 Frequency and percentage distribution of contributing factors related to perinatal mortality

The table also shows that (75.35%) newborns were transferred to NICU/SNCU whereas 24.65% were not at all referred.

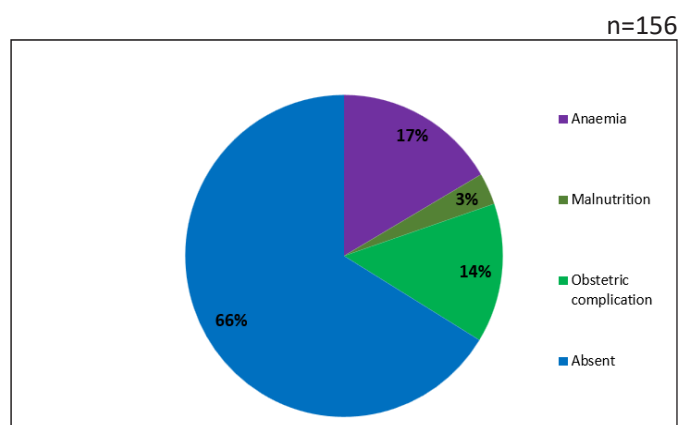
The table also indicates that majority (89.44%) of newborns medical treatment started from less than 24hrs and 10.56% babies treatment were started at >24hrs to within 3 days.

Table 10 Frequency and percentage distribution of contributing factors related to perinatal mortality

Maximum no. of samples (94.87%) distance between house and medical facility were <20 kms and only 5.13% samples distance were 20-50 kms.

Table 4. Distribution of Perinatal Mortality by Age at Deathn₁=142

Factors	Frequency	Percentage (%)
Age at the time of death	-	-
<24 hours	68	47.89
1 – 3 days	28	19.72
4 – 7 days	46	32.39

**Figure 6. Pie diagram showing maternal complication during pregnancy related to perinatal death****Table 5. Distribution of Perinatal Mortality by Mode of Delivery**

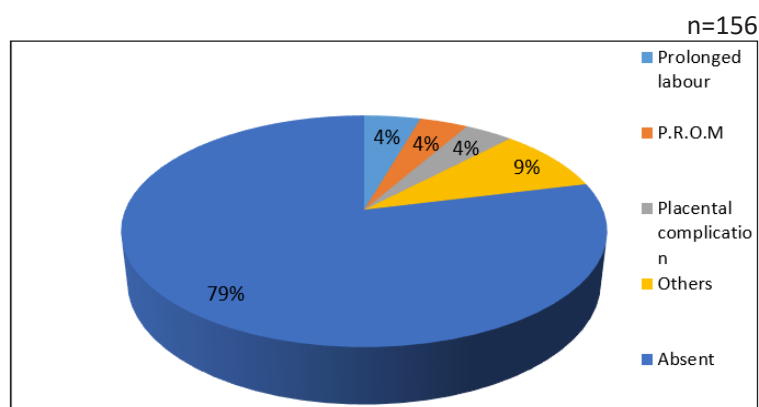
n=156

Factors	Frequency	Percentage (%)
Mode of delivery	-	-
Normal delivery	65	41.67
N/D with episiotomy	63	40.38
Caesarean section	28	17.95

Table 6. Distribution of Perinatal Mortality by Number of Fetuses

n=156

Factors	Frequency	Percentage(%)
No. of fetus Single	142	91.03
Multiple	14	8.97

**Figure 7. Pie diagram showing maternal complication during labour related to perinatal death**

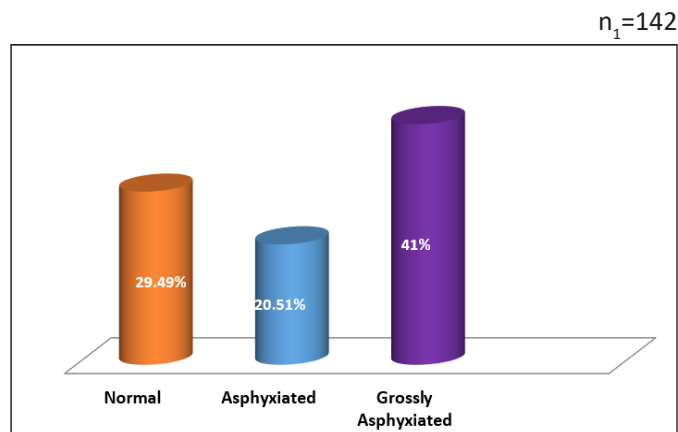


Figure 8.Bar Diagram showing the distribution of condition of the newborn at birth

Table 7.Distribution of Perinatal Mortality by Birth Weight, Sex, and Gestational Age

n=156

Factors	Frequency	Percentage (%)
Birth weight	-	-
<2500 gm	107	68.59
>2500 gm	49	31.41
Sex of the baby	-	-
Boy	95	60.90
Girl	61	39.10
Period of gestation during delivery	-	-
Premature	108	69.23
Mature	48	30.77

Table 8.Distribution of Perinatal Mortality by Causes and Place of Death

n=156

Factors	Frequency	Percentage
Causes for death	-	-
Prematurity and low birth weight	41	26.28
Prematurity and Birth Asphyxia	66	42.31
Congenital deformity	32	20.51
Convulsion and Cord prolapse	25	16
Place of death	-	-
Home	5	3.21
Hospital	151	96.79

Table 9.Distribution of Perinatal Mortality by NICU/SNCU Transfer and Treatment Initiation

n₁=142

Factors	Frequency	Percentage (%)
Baby transferred to NICU/SNCU	-	-
Yes	107	75.35
No	35	24.65

Medical treatment started from	-	-
<24 hrs.	127	89.44
>24 - within 3 days	15	10.56

Table 10. Distribution of Perinatal Mortality by Distance from House to Medical Facility

n=156

Factors	Frequency	Percentage (%)
Distance from house to medical facility	-	-
Within 20 km	148	94.87
20 – 50 km	8	5.13

Discussion

Finding related to occurrence of perinatal mortality

In the study, the perinatal mortality rate was 7.35/1000 live births. The finding is contradicted by the finding of the study on perinatal mortality and its associated risk factors in the Northeast of Iran conducted by Ghorat F, Ghafarzadeh R, and Esfehiani J R (2016). The result revealed that total live births were 16988. Perinatal mortality was 282 (stillborn - 156 and early neonatal mortality - 126). The perinatal mortality rate was 16.6/1000 live births. Yirgu R, Molla M, Sibley L, and Gebremariam A (2010) conducted a population-based case-control study on perinatal mortality magnitude, determinants, and causes in West Gojam. This study showed that there were 4097 total live births. Perinatal mortality was 102, and the perinatal mortality rate was 24.90. This finding is contradicted by the present study finding.

Findings related to demographic characteristics related to perinatal mortality

The finding of the study revealed that most of the 58.33% of mothers related to perinatal mortality belonged to the age group of 18-22 years, and 53.85% of the mothers were primigravida. The findings are consistent with the findings of the study on factors associated with perinatal mortality among public health deliveries in Ethiopia conducted by Getiye Y and Fantahun M (2017). They showed that most of the mothers, 64.6%, belonged to the age group of 19-29 years, and 53.6% of the mothers were primigravida. Behal M and Vinayak R (2012-2014) conducted a cross-sectional study on maternal risk factors for perinatal mortality in Faridabad, Haryana. This research study revealed that 65% of mothers belonged to the age group of 19-34 years and 61% were primigravida. The findings are consistent with the findings of the present study.

Findings related to selected contributing factors related to perinatal mortality

The findings of the study revealed that most of the 68.59% of babies had birth weights <2500 gm, 41.67% of mothers had normal vaginal delivery, and 78.84% of mothers had

no complications during labour. 69.23% of babies were born premature, and 61% were boy babies, significantly higher perinatal mortality. Also in the study it was found that 91.96% of single babies, 42.31% of babies died due to prematurity and birth asphyxia, 75.35% were transferred to NICU/SNCU and 97% of babies' places of death were hospitals. The findings are consistent with the findings of the study on perinatal mortality and associated factors in Jimma University Specialised Hospital, South West Ethiopia, conducted by Aragaw AY (2016). They found that 75% of single-toned babies were born before 37 weeks and 89.4% died in the NICU. The findings are consistent with the findings of the cross-sectional study on prevalence and factors influencing perinatal mortality in rural areas of Mysore, India, by Siddalingappa H, Murthy MRN et al. (2013). They found that 95% were institutional delivery, and birth asphyxia was the leading cause of perinatal mortality. Kokila S.M. and Dwivedi D.A. (2013) conducted a study on the audit of perinatal mortality at SSMCHRC (a rural teaching hospital), a retrospective study among 2333 deliveries. This research study revealed that 52.85% were male babies. The findings are consistent with the findings of the population-based prospective cohort study on perinatal mortality and its contributing factors in Ludhiana among 1431 people by Benjamin IA, Sengupta P, and Singh S (2009). This study revealed that those with low birth weight (birth weight < 2.5 kg) and those born by normal vaginal delivery before < 37 weeks suffered a significantly higher perinatal mortality. The findings are consistent with the findings of a study on risk factors for early neonatal mortality in Brazil among 146 early neonatal death cases by Schoeps D, Almeida FM, Alencar PG et al. (2007). They showed that 63% were vaginal deliveries, 78.1% had no complications during delivery, 81.5% of babies had birth weights <2500 gm, and 60.3% were boy babies born with a 79.5% preterm (<37 weeks) period.

Conclusion

The occurrence of perinatal mortality in the present study was 7.35/1000 live births. Even though this was well below

the national and state values, it indicated improved quality of maternal and child health care. The main contributing factors for perinatal mortality, which are prematurity, birth asphyxia, low birth weight and some of the maternal factors like anaemia and prolonged labour, are avoidable with good antenatal care, a referral system and intrapartum supervision. The investigator also thinks that additional factors that contribute to perinatal loss, like low socioeconomic status at the individual and community level, are important.

Limitation

The study had been conducted in a limited area with a lower sample size in order to explore the facts regarding perinatal death based on the available hospital records. Thus, the investigator declares that the result of the present study has limited scope for generalisation

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Conflict of Interest: None

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