Original Research Article

Causes of neonatal death and associated health seeking behaviour in Barpeta district, Assam, India: a community based study

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ABSTRACT

Background: Infant mortality rate (IMR) is an important indicator of health status and socioeconomic progress of a country. Assam is one of the states of India with a high Infant mortality rate. Information regarding neonatal or infant death mostly is gathered from hospital based studies or large nationally representative studies. Information at the district level is obtained only from the various annual health surveys or the routine reporting system. However these studies do not report health seeking behaviour. In this background, the present study was undertaken to know causes of neonatal deaths as well as health seeking behaviour of families in Barpeta district.
Methods: All neonatal deaths occurring in the district in the first quarter of 2016 were identified. Verbal autopsy was conducted within a month of reported death by using predesigned pretested verbal autopsy questionnaire. A sample size of 90 was purposively selected. Secondary records available with the family were examined.
Results: One fourth of deaths took place on day 1 and 80% died within the first week. Infection namely pneumonia and septicaemia accounted for 47.7% of death followed by asphyxia and respiratory distress syndrome. About 46% of mother had history of prolonged or complicated delivery. Around 54% deliveries were conducted in institutions and only 59% of neonates were taken for treatment.
Conclusions: Infection, asphyxia and low birth weight were most common causes of neonatal death. Early identification of complication and prompt referral has to be promoted by increasing home visit by community workers and removing bottlenecks in transportation.

Keywords: Asphyxia, Infection, Neonatal death, Verbal autopsy

INTRODUCTION

Infant mortality rate (IMR) is an important indicator of health status and socioeconomic progress of a country. Over the years there is considerable decline in IMR in India. The current IMR of India is 40/1000 live birth. Despite this, there is much to be achieved. A disaggregated analysis shows considerable variation from as high as 49/1000 live birth in Assam to as low as 12/1000 live birth in Kerala.[1] In India, the overall decline in child mortality was largely hindered by subdued progress in the area of neonatal deaths, especially within the first week of birth. Averting neonatal deaths is pivotal in reducing child mortality.[2]

The proximate determinants of infant mortality are health system factors, delivery factors, neonatal factors and postnatal factors.[3]

In India, Assam is one of the states with a high Infant mortality rate; SRS 2014 reported a figure of 54/1000 live births of which neonatal mortality was 27/ 1000 live birth.[4] NFHS 4(2015-16) reported an IMR of 48/1000 live birth in the state and SRS 2016 reported 49/1000 live births.[1,5]

A review of neonatal death shows that three fourth of death occurs in the first seven days of life. The major causes of death are infections and complications of preterm birth (low birth weight, asphyxia, respiratory problems). About 40% of deaths are reported in the first day of life.[6] Though the causes of neonatal mortality are generally known, most of this information is gathered from hospital based studies or large nationally representative studies. Information at the district level is obtained only from the various annual health surveys or the routine reporting system .However these studies do not report health seeking behaviour. In this background, the present study was undertaken with the following objectives

- To ascertain the causes of neonatal death in Barpeta district.

- To assess the health seeking behaviour in families regarding the illness leading to neonatal death.

METHODS

Study area

Barpeta district is one of the backward districts in Assam. It occupies an area of 3245 km² and has a population of 16,93,190 (as per census 2011). It has a literacy of 63.81%. More than four-fifths of the population depends upon agriculture for their livelihood.[7,8] The district has 11 development blocks and 840 revenue villages. Maternal health services are provided through a network of a medical college, one district hospital, one sub divisional hospital, six CHCs, eight Block PHCs, twenty mini PHCs, eight state dispensaries and two hundred sixty four sub-centres.

Study subjects

The study subjects included mother or caregivers of deceased neonates and the persons who were present at the time of death of neonates.

Study design

Community based Cross-sectional study

Data collection techniques and tools

All neonatal deaths occurring in the district over three month's period (1st January, 2016 to 31st March, 2016) were identified. The sources of this information were routine health reporting system and Anganwadi workers (AWW) of ICDS project. AWWs were accessed at their monthly meetings at the CDPO office. To reduce recall bias, verbal autopsy was conducted within a month of reported death.

A sample size of 90 was purposively selected. In order to ensure geographical representation 8 neonatal deaths from each block were included in the study. A predesigned pretested verbal autopsy questionnaire with input from various study instruments was used to collect information.[9]

The verbal autopsy tool had identifying information, filters to ascertain the cause of death and health seeking behaviour. Secondary records available with the family were examined. A Paediatrician was consulted to narrow down to the underlying cause of death. B G Prasad socioeconomic classification was used .[10]

The data was manually analyzed. Permission was obtained from Institutional Ethics Committee before starting the study.

RESULTS

Among the 90 neonatal deaths, 49 (54.4%) were male and 41 (45.6%) were female. 79% were of Muslim and 21% were of Hindu parentage. As per Modified BG Prasad socioeconomic status classification, 54% had a PCI of less than 927 and were socioeconomic scale 5, 27% had per capita income of INR 928-1855 and were socioeconomic scale 4 and 19% were socioeconomic scale 3 with a per capita income of INR 3093-6185.

Mother was the respondent in 42 neonatal deaths and in the remaining 48 the respondent was a close family member.

One fourth of deaths of neonates took place within 24 hours of birth and 80% died within the first week of life (Table 1).

Table 1: Time of death.

Time of death	No of neonatal deaths (%)
Within 24 hours of birth	23 (25.5%)
2- 7 days of birth	49 (54.4%)
7- 28 days of birth	18 (20.0%)

Table 2: Causes of death.

Immediate cause of death	Underlying cause of death
Pneumonia - 26 (28.8%)	Low birth weight - 19 (21.1%)
Asphyxia/respiratory distress syndrome-20 (22.2%)	Preterm - 4(4.4%)
Septicemia /infections –17 (18.9%)	Post-dated - 2 (2.2%)
Birth injury - 5 (5.6%)	Prolonged /complicated labour-41(45.6%)
Congenital malformation -2 (2.2%)	
Seizure -2 (2.2%)	
Diarrhoea -5 (5.6%)	
Unknown - 13 (14.4%)	

Infections namely pneumonia and septicaemia accounted for 47.7% of death followed by asphyxia and respiratory distress syndrome. One fourth of newborn babies had low birth weight or prematurity. Complicated or prolonged labour was reported in about 46 % deliveries (Table 2).

About 46% deliveries were conducted at home & in only 53 (59%) neonates were taken for treatment. Public health facility was the most commonly sought place for treatment of neonates in the district. Illness was not considered serious in about 43% cases and treatment was not sought. Duration of illness was less than 72 hours of duration in 61% cases (Table 3).

Table 3: Health seeking behaviour.

Place of delivery (n= 90)	Home-41 (45.5%) Hospital-49 (54.4%)
Whether treatment received before death (n=90)	Yes-53 (58.9%) No-37 (41.1%)
Place of treatment (n= 53)	PHC/CHC/public health facility-47(88.6%) Private practitioner-4 (7.5%) Religious leader-5 (9.4%) Traditional healer 5 (9.4%)
Reasons for not seeking treatment (n=37)	Illness not severe-16 (43.2%) No money-5 (13.5%) No transport-4 (10.8%) No one to accompany-3 (8.1%) Died soon after birth-9 (24.3%)
Place of death (n=90)	Home -39 (43.3%) Hospital -47(52.2%) Transit-4(4.4%)
Duration of illness (n=90)	<24 hours- 25(27.8%) 2-3 days -30 (33.3%) 4-7 days- 15 (16.7%) >7 days-16(17.8%) Can't say-4 (4.4%)
Out of pocket expense incurred in public health facility (n=47)	INR <1000-12 (25.5%) INR 1000-4000-14 (29.7%) INR 4000-8000- 15 (31.9%) No expense -6 (12.7%)

DISCUSSION

Infant mortality rate is an indicator of socioeconomic development. Majority of neonatal deaths occurred in low socioeconomic class. Analysis of NFHS data 1, 2 and 3 shows similar observation.[11] Majority were of Muslim parentage. The district in general has 60% Muslim population.[7,8]

Table 1 shows that 25% of deaths took place on day 1 and 80% died within the first week. Early neonatal deaths have been reported by many authors. A study in Uttar Pradesh reported 32% death on day 1 and 71% death during the first 1 week.[12] Goyal reported 30% neonatal death in first day and 60% death in the first week of life.[13]

Table 2 shows the causes of death. Infection namely pneumonia and septicaemia accounted for 47.7% of death followed by asphyxia and respiratory distress syndrome. In 25.5% newborn had low birth weight or prematurity. Infection, asphyxia and low birth weight have been reported as commonest cause of neonatal mortality by various authors in diverse settings.[14-20]

The neonatal cause of death distribution differs between the early and late neonatal periods. About 46% of mother in this study had history of prolonged or complicated delivery. Intra-partum complications as a risk factor for early neonatal death has been reported.[21]

Table 3 presents the health seeking behaviour in the community. Institutional delivery is an important intervention to prevent neonatal death. Around 54% deliveries were conducted in institutions. The district reported 52% institutional delivery as per recent estimates.[22]

Only 59 % of neonates were taken for treatment. Public health facility was the most commonly sought place. Ten neonates were initially taken to traditional healers but with no improvement they were taken to public health facilities. Traditional beliefs and practices are firm in this community and it is found to contribute to delay in initiation of appropriate treatment. The reasons for not seeking treatment were multiple. We reported the single most major reason for not seeking treatment. In 12 deaths the family was not aware of the free treatment and transportation for neonatal illness under Janani Sishu Suraksha Karyakram. Four neonates died in transit during referral and two left against medical advice to pursue traditional treatment at home. In 61% of neonates the illness was less than 3 days duration. This emphasizes the need for early detection and mobilization to hospital. Home visit by trained health worker is an important intervention to prevent neonatal death and needs to be done under IMNCI and NSSK of RCH program.[23] In the present study 77.8% neonates were visited at least once at home by ASHA/ANM. Visits were erratic and not as per guideline. There is room for improvement in quality and number of visit. Under NSSK transportation and treatment of all newborn should be free of cost but 87% families were found to incur expenses. The major expense incurred was during mobilization from home to hospital in private vehicle as ambulance were in short supply followed by expense in medicine and stay.

CONCLUSION

The important causes of neonatal death are infection, asphyxia and low birth weight. Maternal health is intricately linked to neonatal survival. Early neonatal mortality is very high. Health seeking behaviour is not favourable. Early identification of complication and prompt referral has to be promoted by increasing home visit by community workers and removing bottlenecks in transportation.

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