

# A Study of Causes of Neonatal Mortality in Tertiary Care Hospital, Bagalkot

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## ABSTRACT

**Introduction:** Neonatal deaths account for a major proportion of child deaths globally. Major causes of neonatal deaths are preterm birth, asphyxia, sepsis, pneumonia, congenital anomalies, diarrheal diseases, and tetanus. Without a sound knowledge about the changing trends in morbidity and mortality, it will be difficult to formulate appropriate strategies in management, prevention, and review. The present study was aimed at providing statistical data related to mortality pattern seen in hospitalized neonates. **Methodology:** A descriptive case series study was conducted with records of the patients who were admitted in the Paediatric Department of HSK Hospital and Research Centre over a 12-month period. The collected data were analyzed using Microsoft Excel and appropriate statistical test was used to interpret the data. **Results:** A total of 101 infants died in our hospital, among them maximum 87 (86.14%) mortality was observed in early neonatal period. Causes of mortality were classified as direct and antecedent causes. The most common direct cause was found to be birth asphyxia 35 (34.66%) followed by respiratory distress syndrome 15 (14.85%) and meconium aspiration syndrome 15 (14.85%). Congenital cardiomyopathy ( $n = 3$ ) was the most common congenital anomaly. 79.35% of the neonates had low birth weight and 20.65% were small for gestational age. **Conclusion:** With birth asphyxia being the most common cause, education and training regarding neonatal resuscitation will play a major role in decreasing the neonatal mortality.

**Key words:** Causes, Neonatal Mortality, Tertiary care hospital

## INTRODUCTION

Survival of the newborn during the 1<sup>st</sup> week of life is determined by the stresses of intrauterine life and the birth process, as well as by the adjustment to a new environment, nutrition, and infection. Therefore, the early neonatal period is the most hazardous period of life.<sup>[1]</sup>

Neonatal deaths account for a major proportion of child deaths globally.<sup>[2]</sup> Major causes of neonatal deaths are preterm birth, asphyxia, sepsis, pneumonia, congenital anomalies, diarrheal diseases, and tetanus.<sup>[3]</sup> Estimates from the World Health Organization (2012) show that although under-5 mortality has fallen globally from 12.2 million deaths in 1990 to 7.6 million deaths in 2010, the fall in neonatal mortality is considerably less than that in the post-neonatal period.<sup>[4]</sup>

Each year about 4 million newborns die before they are 4 weeks old and half of them die in the first 24 h. It accounts

for 40% of the under-5 mortality. 98% of these deaths occur in the developing countries.<sup>[5]</sup> This vast difference in the national and state mortality rates has been attributed to the wider spread of literacy (particularly, female literacy) and primary health care. Records of vital events like death constitute an important component of Health Information System. Without a sound knowledge about the changing trends in morbidity and mortality, it will be difficult to formulate appropriate strategies in management, prevention, and review.<sup>[5]</sup> The present study was aimed at providing statistical data related to mortality pattern seen in hospitalized neonates.

## Objectives

The objectives of the study were to describe and analyze the mortality pattern of hospitalized neonates in the Paediatric Department of HSK Hospital and Research Centre.

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## METHODOLOGY

A descriptive case series study was conducted with records of the patients who were admitted in the Paediatric Department of HSK Hospital and Research Centre over a 12-month period. A pre-tested structured questionnaire was used to collect the data. The questionnaire collected information regarding age, sex, time interval between admission and death, period of gestation, birth weight, cause of death, etc. The collected data were analyzed using Microsoft Excel and appropriate statistical test was used to interpret the data.

## RESULTS

There were a total of 835 admissions during the study period. Of total admitted cases, 101 neonates died, of these 72.28% ( $n = 73$ ) were male and 27.72% ( $n = 28$ ) were female, with the M:F ratio for deaths being 2.60. Of the 101 deaths, 46 (45.5%) were referred cases. 87 (86.14%) neonatal deaths occurred within 1 week of admission.

Of the total deaths, 92 (91%) were low birth weight (LBW) babies. Among these, 73 (79.35%) were preterm and 19 (20.65%) were small for gestational age.

Causes of mortality were classified as direct [Table 1] and antecedent causes [Table 2]. The most common direct cause was found to be birth asphyxia 35 (34.66%) followed by respiratory distress syndrome 15 (14.85%) and meconium aspiration syndrome 15 (14.85%). Congenital cardiomyopathy ( $n = 3$ ) was the most common congenital anomaly.

## DISCUSSION

This was a descriptive case series study using retrospective analysis of medical records of the neonates who died in the Department of Paediatrics, HSK Hospital and Research Centre over a 12-month period. The mortality was higher among male neonates when compared to female neonates because they are biologically more fragile. It was also observed that the admission rate was also higher with male neonates due to their biological vulnerability to infections.<sup>[5-7]</sup> The study identified early neonatal period as the major contributor to neonatal mortality which accounted for 86% of the deaths. Similar observation made by Ernakulam study<sup>[5]</sup> and the ICMR Young Infant Study Group.<sup>[8]</sup>

Of the total deaths, 45% of the cases were referred cases and majority of them died within 24 h of admission. A study in Kolkata revealed a higher percentage (55%) of deaths within 24 h of admission.<sup>[7]</sup> Thus, it conveys the need of addressing delay in diagnosis, transportation, and referral. The main causes of neonatal mortality are intrinsically linked to the health of the mother and the care that she receives

**Table 1:** Causes of neonatal mortality

Causes of neonatal mortality	n (%)
Birth asphyxia	35 (34.66)
Respiratory distress syndrome	15 (14.85)
Meconium aspiration syndrome	15 (14.85)
Septicemia	12 (11.88)
DIC	3 (2.97)
Neonatal seizures	4 (3.96)
Congenital cardiomyopathy	3 (2.97)
Intestinal obstruction	2 (1.98)
Malaria	1 (0.99)
Tracheoesophageal fistula	2 (1.98)
Pneumonia	4 (3.96)
Hyperbilirubinemia	2 (1.98)
Other anomalies	3 (2.97)
Total	101 (100)

**Table 2:** Antecedent causes of neonatal mortality

Indirect causes	n (%)
Preterm	73 (79.35)
Small for gestational age	19 (20.65)
Total	92 (100.00)

before, during, and immediately after giving birth. In the present study, it was observed that neonatal deaths were due to birth asphyxia 35 (34.66%) followed by respiratory distress syndrome 15 (14.85%) and meconium aspiration syndrome 15 (14.85%). About 10% of neonatal deaths were due to congenital anomalies. In the ICMR study, prematurity (16.8%), birth asphyxia (22.3%), and infections including septicemia, pneumonia, meningitis, and other infections (32.8%) were the predominant causes of death.<sup>[8]</sup> In the JIPMER study, systemic infections caused 52.3% of deaths followed by birth asphyxia and injuries (29.23%).<sup>[9]</sup> Birth asphyxia and septicemia were the most common causes of death in Kolkata study.<sup>[7]</sup> With the present study identifying LBW and prematurity as the major indirect causes of death, there is a need for further advances in the intensive neonatal care using more sophisticated technology.

It was also observed that 12 (11.88%) neonatal deaths were due to infection. Singh noted from hospital-based data that bacterial sepsis was a major cause of neonatal mortality in India.<sup>[10]</sup> Infections during the neonatal period stand at a higher rank in the causes of mortality which cautions the health-care system in methods followed for asepsis.

## CONCLUSION

Neonatal mortality is an indicator of health status of the community. This study identifies early neonatal period as the major contributor to neonatal mortality which is influenced

by birth weight. With birth asphyxia being the most common cause, education and training regarding neonatal resuscitation will play a major role in decreasing the neonatal mortality.

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