Original Research Paper

Hospital Administration

EVALUATION OF NEONATAL MORTALITY IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT Neonatal care and the infant care is one of the very important performance indicators in the Hospital and the Mortality rate related to it indicates one of the National Indicator which reflects country's scope and development in the Health care services and having this importance, a continuous evaluation of the neonatal services and the Neonatal Mortality Rate has to be taken as a measure and mandate in improving the services related to it. **AIM:** To evaluate the neonatal mortality rate in a tertiary care hospital. **OBJECTIVES:**
1) To assess the causes leading to neonatal deaths.
2) To analyse the mortality pattern of the neonates in a hospital and the interventions toovercome it.
MATERIALS AND METHODS: A Retrospective Study was conducted for a period of six months, from April to September, 2018. In this study both male and female were included. All live neonates (Inborn and Outborn) admitted to Neonatal Care Unit of the Hospital were included. Unknown babies also included in the study. Brought dead neonates were excluded from the study. Information of the neonates was collected from the case sheets through e-HMS and registers from NICU (neonatal intensive care unit). Medical records of all the admitted neonates were observed, reviewed and analysed. **OBSERVATIONS AND RESULTS:** We observed from the medical records of NICU that there were 170 neonatal deaths, 545 discharges and 25 LAMA cases during the study period. The most common cause of neonatal deaths which were found in this hospital were Preterm, Low birth weight, Respiratory distress and Sepsis.

INTRODUCTION:
Neonatal care and the infant care is one of the very important performance indicators in the Hospital and the Mortality rate related to it indicates one of the National Indicator which reflects country's scope and development in the Health care services and having this importance, a continuous evaluation of the neonatal services and the Neonatal Mortality Rate has to be taken as a measure and mandate in improving the services related to it. The main causes of neonatal mortality are intrinsically related to the health of the mother and the care she receives during the pre- natal , intra natal and the post- natal period of 4 weeks after the delivery. Many neonatal infections such as Toxoplasmosis, Influenza, Parainfluenza, Syphilis, Varicella, Rubella, Cytomegalovirus, Herpes and others can be prevented by proper and timely care during the pregnancy and child birth.

Neonatal mortality rate is the number of neonatal deaths per 1000 live births. A neonatal death is defined as a death during the first 28 days of life. In India, 26 million babies are born every year, and 1.2 million die in the first four weeks of life, which accounts for a quarter of global neonatal deaths. The current NMR in India is 28 per 1000 live births. According to the UNICEF, NMR in India was 25.4 in 2016 which ranked 12th among 52 countries. The target of the NMR to be reached by 2030 is 12 deaths per 1000 live births. The rate of neonatal mortality varies widely among the different states of India, ranging from 11 per 1000 live births in Kerala to 48 per 1000 live births in U.P. It has been argued that nearly three quarters of all neonatal deaths could be prevented if women were adequately nourished and received appropriate care during pregnancy, child birth and in the postnatal period.

AIM: To evaluate the neonatal mortality rate in a tertiary care hospital.

OBJECTIVES:
1) To assess the causes leading to neonatal deaths.
2) To analyse the mortality pattern of the neonates in a hospital and the interventions toovercome it.

MATERIALS AND METHODS:
In this hospital, NICU is located in the ground floor of the IP block in the Paediatric department. A Retrospective Study was conducted for a period of six months, from April to September, 2018. In this study

both male and female were included. All live neonates (Inborn and Outborn) admitted to Neonatal Care Unit of the Hospital were included. Unknown babies also included in the study. Died neonates who brought to hospital were excluded from the study. Information of the neonates was collected from the case sheets through e-HMS and registers from NICU (neonatal intensive care unit). Medical records of all the admitted neonates were observed, reviewed and analysed.

The Government of Telangana has initiated the HMIS (Hospital Management Information System) or e-Hospital Management System (e-HMS), in this hospital through CDAC (Centre for Development of Advanced Computing), which is a major step towards adapting technology to monitor and improve health care services. About CDAC, this organisation has developed a software which has 23 modules, out of which 6 modules are presently working in this hospital, which help in collecting the data of the patients. e-HMS has the functionalities of integrated hospital management system covering PAS (Patient Administration Services), clinical and diagnostic services, support services, personnel and financial management with seamless integration with e-Aushadhi (supply chain management of drugs) and EMMS (Equipment Maintenance Management System).

OBSERVATIONS AND RESULTS: This study was conducted in the present hospital which has 740 admissions in NICU for a period of 6 months (April to September, 2018). We observed from the medical records of NICU that there were 170 neonatal deaths, 545 discharges and 25 LAMA cases during the study period.

Figure1

Number of Admissions, Deaths, LAMA and Discharges in NICU
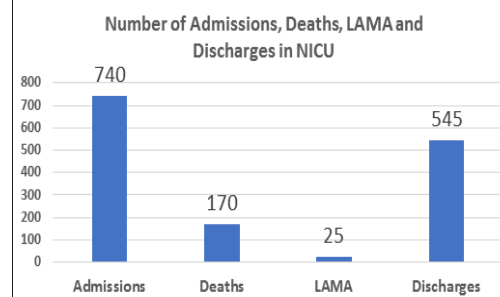
Out of 740 admissions, 403 were males in which 93 (54.7%) died and 337 were females in which 77 (45.3%) died indicating that male neonatal deaths are more when compared to females which is in comparision with Surender et al(1) study indicating that male neonatal deaths are more when compared to females.

Table 1

	Male	Female
Total no of admissions	403	337
Total no of deaths	93(54.7%)	77(45.3%)

Figure 2
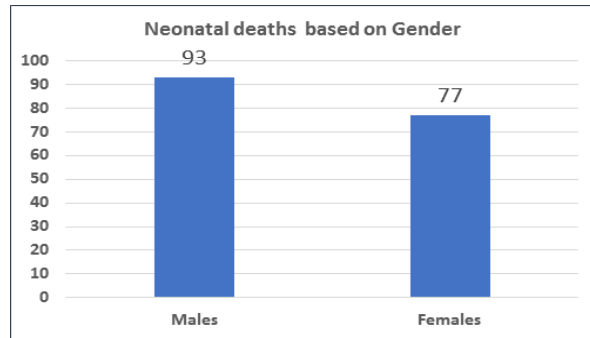
The main causes of neonatal deaths were low birth weight, sepsis, respiratory distress, hypoxic ischemic encephalopathy, congenital abnormalities (1)

The most common cause of neonatal deaths which were found in this hospital were as in the table 2.

Table 2

Preterm	87	51.17%
Low birth weight	62	36.40%
Respiratory distress	58	34.11%
Sepsis	25	14.70%

The most common causes of preterm deaths include pneumonia, sepsis, meningitis, respiratory distress syndrome, necrotizing enterocolitis, urinary tract infections and others.

Figure 3
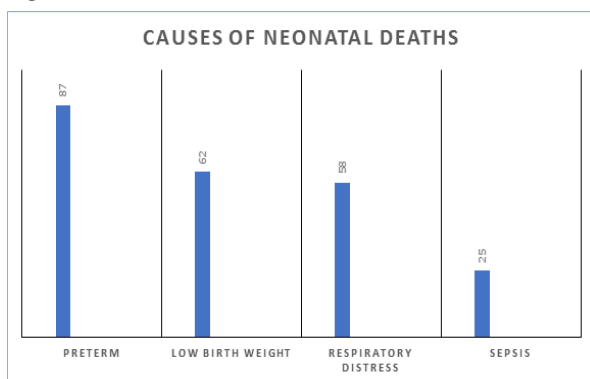
In India, it is estimated that 40% of all stillbirths and neonatal deaths take place during labour and the day of birth. About 75% of the total neonatal deaths occur within the first week of life. India accounts for 40% of global burden of low birth weight babies with 7.5 million babies being born with a birth weight less than 2500 grams.

Low Birth Weight is defined as birth weight of a live born infant of less than 2500 grams regardless of gestational age. (2)
Subcategories of LBW include (3):

1. Low birth weight which is 1500 to 2500gram
2. Very Low Birth Weight which is less than 1500 grams
3. Extremely Low Birth Weight which is less than 1000 grams

In the present study, it was observed that more number of neonatal deaths occurred among the babies whose birth weight was between 1.5 −2.5 kgs (36.40%).

Table 3

Normal birth weight	>2.5kgs	25%
Low birth weight	1.5-2.5kgs	36.4%
Very low birth weight	1.0-1.5kgs	33%
Extremely low birth weight	<1.0kg	6%

Figure 4
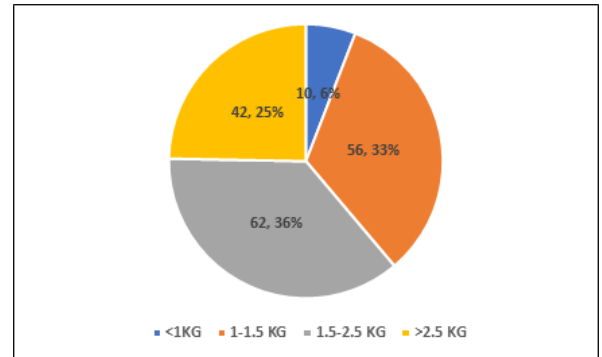
DISCUSSION: The study of mortality risk measurement among the new born admitted to the neonatal intensive care units is attaining an increasing level of importance There were 5500 live births recorded during this study period. The neonatal mortality rate in this study period was observed to be 31 per 1000 live births when compared to study by Anthony O. Adetola et al [4] they have reported the NMR was 3.27 per 100 livebirths (32 per 1000 live births) and study by Surender et al [1] the neonatal mortality rate was18.2 per 100 live births (182 per 1000 live births). In the present study male babies (54.7%) have a higher risk than female babies (45.3%) dying during the neonatal period. Preterm birth is generally attributed as a direct cause of death while LBW is considered as a risk factor or underlying condition. In our study, the preterm were (51.17%), LBW (36.4%) followed by RD (34.1%) and sepsis (14.7%). And major associated causes of the deaths include Birth asphyxia followed by Meconium aspiration, Meconium stained liquor, Neonatal jaundice and Neonatal convulsions. Preterm birth is the leading cause of neonatal death globally. Those who die of prematurity often succumb to hypothermia, with 80% of new-borns weighing below 1.5kg dying if their core temperature falls below 33C [5]. In our study, we have more number of babies who fall under the category <1.5kgs. For these babies, "Kangaroo Mother Care" (KMC) can be a life-saving intervention. This inexpensive technique involves the mother and baby having continuous skin-to-skin contact, in an effort to improve thermoregulation, breastfeeding and bonding.

Breastfeeding has long been encouraged as a public health strategy in developing countries. In Africa, Asia, Latin America and the Caribbean, only around half of babies under 2 months of age are exclusively breastfed, with this figure dropping to around 30% by 5 months of age. A recent systematic review suggests that, within the non-exclusively breastfed population, infants who started breastfeeding within 24 hours of delivery had lower all-cause mortality rates than those who had delayed feeding[6]. Over the last 5 years, there has been an increased focus on the use of antenatal corticosteroids for the prevention of death secondary to preterm labour in low-resource settings. Steroid use is one of the most effective interventions available to prevent preterm death in high-income countries.

More than one-third of new-borns who die within the neonatal period don't survive their first day of life and three-quarters do not survive past their first week of life. Evidence for the effectiveness of immediate care for new-borns in the delivery room is growing. The American Academy of Paediatrics has developed a neonatal resuscitation program for use specifically in developing countries, known as Helping Babies Breathe (HBB) [7], this program is based on simple stimulation and bag-mask ventilation techniques.

The rates would come down if measures were taken to improve the health care system by adopting solutions like clean water, clean hands, clean surface, clean cord cut, clean cord tie, clean cord stump, use of disinfectants and a creation of awareness to the mothers about breast feeding within first hour, skin to skin contact and good nutrition.

Adequate antenatal care to the mothers at risk and the advances in the

neonatal care with the use of sophisticated technology will improve neonatal outcome. Understanding the causes of neonatal mortality may help to implement interventions to promote new-born survival.

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