



Management and outcomes of the patients admitted in SNCU

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Abstract

Introduction: *The proliferation of secondary and tertiary level neonatal intensive care units (NICUs) has led to dramatic improvement in median survival rates of 58% and 88% among extremely low birth weight (LBW) and very LBW newborns, respectively.*

Materials and Method: *It was an observational study done at Regional hospital Bilaspur catering rural area population of Bilaspur, study includes both inborn and out born babies admitted in SNCU between 2015 to 2018.*

Results: *Most of the patient got discharge 1456 (87.8%), 40 (2.4%) out of total admission of newbourns died. Most of the neonatal death was recorded within 1 day and between the periods of 1 - 3 days of admission 0.8%. 0.98% of new bourns died with 1 to 6 days of age.*

Conclusion: *Improve neonatal outcome, it is imperative to be vigilant especially during the first 24 hours of life.*

Keywords: *Special neonatal care unit.*

Introduction

Newborn health is now considered as high level national priority globally^[1]. The current neonatal, infant, and under five mortality rate in India are 24, 32, and 34/1000 live births, respectively^[2]. Thus, neonatal mortality constitutes the major proportion of under five mortality in India as well as other countries^[2]. After the introduction of the National Rural Health Mission (NRHM), especially Janani Suraksha Yojana in 2005 for improvement in maternal and child health, there has seen a tremendous growth of neonatal intensive care in India^[2]. The proliferation of secondary- and tertiary level neonatal intensive care units (NICUs) has led to dramatic

improvement in median survival rates of 58% and 88% among extremely low birth weight (LBW) and very LBW newborns, respectively^[3].

The India Newborn Action Plan launched in September 2014, for accelerating the reduction of preventable newborn deaths and stillbirths in the country has a goal of attaining “Single Digit Neonatal Mortality Rate (NMR) by 2030”^[1]. The National Neonatology Forum of India stratifies neonatal care into three levels as follows: Level I includes basic resuscitation and healthy newborn care, Level II includes care of preterm newborn >32 weeks gestational age (GA) (subdivided into IIA and IIB based on brief ventilation of <24 h and continuous positive airway pressure (CPAP)

support), and Level III includes care of extreme preterm newborns^[4]. Under the NRHM, sick neonatal care units (SNCUs) are established as secondary level NICUs, generally at district level hospitals. Ideally, these should possess 12–20-bedded units, with 4 trained doctors, and 10–12 nurses and support staff with the provision of 24 × 7 services to sick newborns, except assisted ventilation, and major surgeries^[4]. Neonates who require higher intensive care are referred to tertiary level NICUs at apex centers^[4]. In a country like India, where the majority of neonatal care occurs in secondary level NICUs, it is a priority for health-care officials to divert the resources for improvising these SNCUs to bring down the NMR^[4]. Hence, it is high time, a clinical study should be performed in a secondary care NICU to reveal the true picture of neonatal management and outcome in SNCU.

Materials and Method

It was an observational study done at Regional hospital Bilaspur catering rural area population of Bilaspur, surrounding areas of Mandi, Hamirpur and Solan districts, Study includes both inborn and out born babies admitted in SNCU between 2015 to 2018.

This SNCU has 8 beds, It is equipped with phototherapy unit, radiant warmer, oxygen concentrator, suction machine, generator/inverter. The admission criteria of this SNCU allows admitting newborns with birth weight <2500 g, GA <37 weeks, multiple deliveries (twins and triplets), major life threatening malformations, birth asphyxia requiring endotracheal intubation and/or requiring bag and mask ventilation for at least 5 min, meconium aspiration syndrome, respiratory distress syndrome (RDS), transient tachypnea of newborn and other newborns with respiratory distress since birth and newborns with central cyanosis (not improving with oxygen therapy). Other important clinical indications include neonatal seizures, significant birth injury, history of prolonged rupture of membrane in mother >24 h due to increased risk of early-onset

neonatal sepsis (EONS), if the mother is sick and unable to provide adequate care to the newborn, babies born to diabetic mother, especially if the mother is a poorly controlled diabetic and the baby is macrosomic, babies born to mother with Rh isoimmunization in pregnancy, babies with neonatal hyperbilirubinemia requiring phototherapy and babies with hypoglycemia, polycythemia, lethargy, or neonatal sepsis. Ethical clearance from pediatric department of concerned hospital.

Results

Total 1 indicates that 1658 newborns were admitted in SNCU, 37.2% newborns were having weight less than 2500 gm. Total male babies were 977 (58.9%) and female babies were 672 (40.5%). Out of total 1254 (75.6%) were inborn and 453 (24.3%) were out born. 519 (31.3%) newborns were pre term and 1142 (68.8%) were term babies. Significantly higher number of inborn babies were admitted compared to out born babies.

Table no. 2, 921 (55.5%) newborns received phototherapy, 589 (35.5%) received antibiotic, and 401 (24.1%) received oxygen. Most of the patient got discharge 1456 (87.8%), 40 (2.4%) out of total admission of newborns died. 725 (43.7%) newborns were having hospital stay for 1-3 day, 577 (34.8%) stayed in hospital for 4-7 days. In our hospital 1 radiant warmer and 1 suction machine was non function during all the years of research.

Table no. 3, most of the neonatal death were recorded within 1 day and between the period of 1 - 3 days of admission 0.8%. 0.98% of newborns died with 1 to 6 days of age. 19 preterm babies died which is 1 % of all newborns admitted in SNCU. Most of the deaths were observed in term and pre term babies.

Table no. 1: SNCU admission record

| | | 2015 | 2016 | 2017 | 2018 |
|---|--------------|------|------|------|------|
| Admission in the unit | | 196 | 394 | 460 | 608 |
| Male | | 117 | 235 | 271 | 354 |
| Female | | 79 | 159 | 180 | 254 |
| Birth weight of the baby at the time of admission | ≥2500 gm | 98 | 226 | 286 | 421 |
| | 1500-2499 gm | 82 | 154 | 149 | 163 |
| | 1000-1499 gm | 15 | 14 | 19 | 22 |
| | <1000 gm | 1 | 1 | 7 | 3 |
| Gestation | >37 weeks | 122 | 269 | 319 | 432 |
| | 34-37 weeks | 55 | 90 | 109 | 141 |
| | < 34 weeks | 19 | 36 | 33 | 36 |

Table no. 2 Management and outcome

| | | 2015 | 2016 | 2017 | 2018 |
|--------------------------------|---|------|------|------|------|
| Management | Phototherapy | 82 | 204 | 262 | 373 |
| | Antibiotic | 85 | 187 | 177 | 140 |
| | Oxygen | 68 | 87 | 97 | 149 |
| Step down care | No. of babies managed in the unit from postnatal ward / step down | | | | |
| | No. of babies managed in the step down from | 41 | 9 | 23 | 169 |
| Outcome | Discharge | 150 | 345 | 407 | 554 |
| | Referral | 26 | 45 | 42 | 39 |
| | LAMA | 0 | 1 | 0 | 5 |
| | Died | 12 | 10 | 7 | 11 |
| Duration of stay | <1 day | 15 | 23 | 28 | 25 |
| | 1-3 days | 70 | 143 | 183 | 329 |
| | 4-7 days | 47 | 144 | 195 | 191 |
| | >7 days | 56 | 91 | 50 | 64 |
| No of non functional equipment | Phototherapy unit | 0 | 0 | 0 | 0 |
| | Radiant warmer | 1 | 1 | 1 | 1 |
| | Oxygen generator | 0 | 0 | 0 | 0 |
| | Suction machine | 1 | 1 | 1 | 1 |
| | Generator/ inverter | 0 | 0 | 0 | 0 |

Table no. 3 Death record of SNCU

| | | 2015 | 2016 | 2017 | 2018 |
|--|--------------|------|------|------|------|
| Duration between the time of admission | <1 day | 5 | 3 | 3 | 4 |
| | 1-3 days | 3 | 3 | 3 | 6 |
| | 4-7 days | 3 | 2 | 1 | 0 |
| | >7 days | 1 | 2 | 0 | 1 |
| Age at death | <1 day | 5 | 2 | 1 | 4 |
| | 1-6 days | 5 | 4 | 5 | 4 |
| | ≥ 7 days | 2 | 4 | 1 | 3 |
| Birth weight | ≥ 2500 gm | 5 | 3 | 1 | 7 |
| | 1500-2499 gm | 3 | 6 | 2 | 2 |
| | 1000-1499 gm | 4 | 1 | 0 | 1 |
| | <1000 gm | 0 | 0 | 4 | 1 |
| Gestation | Term | 5 | 5 | 2 | 7 |
| | Preterm | 5 | 5 | 5 | 4 |
| | Post term | 2 | 0 | 0 | 0 |

Discussion

In our study most of the patient got discharge (88.4%). Prinja et al. described four secondary

level NICUs (Vaishali, Guna, Bhubaneswar, Shivpuri) in three different states of India in 2013^[5]. All four NICUs had a discharge rate

between 60% and 80%, comparable to our clinical study. Yousuf et al. reported 85% successful discharge out of 336 neonates from a secondary level of NICU in Bathinda, Punjab, in 2017^[6].

Patil Ravindra et al., in 2014, in a cross sectional study in tertiary care NICU in Shivamogga, Karnataka described around 82% discharge rate and 10% mortality rate among 1041 neonates^[7]

Rakholia et al. and other rural India studies^[8-11]. During the study, the out born admissions were less in number compared to inborn admissions. The low out born admission directs the need to strengthen referral system with community based interventions.

This study found lower rate of neonatal mortality 2.1% compared to other studies conducted in India. Out of total 40 deaths, 30 (75%) died within first 72 hours of admission (71.2%), and 30% occurring in the first 24 hours. Such early deaths in SCBU have also been reported by several other workers in the developing countries, and all points toward revisiting circumstances during labour and delivery, timely referral, and timely seeking of medical assistance by parents. With the exception of SBA and congenital malformation, neonatal mortality rates were invariably higher among the LBW infants in all the neonatal problems considered. It became obvious that any reduction in the overall neonatal mortality will aim at instituting measures that will reduce the incidence of LBW deliveries.

Conclusion

Majority of the admissions occurred within the first 24 hours of life. Therefore to improve neonatal outcome, it is imperative to be vigilant especially during the first 24 hours of life. Progress is possible, but only if we manage to prevent or detect and treat problems as early as possible, which can be achieved by public awareness, training of manpower and procurement of necessary equipment's.

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