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Study of Perinatal Outcome of a Tertiary Care Hospital in Urban Area

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Abstract: ***Retrospective observational study was conducted to assess the perinatal outcome of out tertiary care hospital from January 2016 to December 2018. The data was collected from the record files and analyzed. Out of total delivery (12373), cesarean section delivery 3701 (29.9%), forceps delivery 268(2.16%), vacuum delivery in 325(2.62%), VBAC in 122(0.98). Total births were 12478 and live births were 12239. Out of total live births, 1101(8.99%) babies were admitted in NICU. Out of total live births (12478) , preterm babies 1194(9.7%) and low birth weight babies 5096 (41.6%). Neonatal mortality rate was 10.2/1000 births. Babies admitted in NICU were 1101(8.99%) of total babies. Hyaline membrane disease, sepsis, birth asphyxia, meconium aspiration syndrome, congenital heart disease were major morbidities. Hyaline membrane disease (35.2%)being the most common primary cause of mortality in preterm babies.***

Keywords: Perinatal mortality, morbidity, delivery, low birth weight, preterm

1. Introduction

Perinatal and neonatal periods are considered as the most critical phase of life[1]. It reflects the general health and the various socio biologic features of mothers and infants[2, 3]. Out of 25 million babies born in India every year, 1 million die. India alone contributes to 25% mortality around the world[4]. According to the Sample Registration System (SRS) statistical report 2016 the current neonatal mortality rate in India is 24 and ranges from 14 in urban to 27 in rural areas.

Neonatal and infant mortality are the major health indicator of maternal and child health services of the state and nation. Globally also, health facility of a country is evaluated on the basis of health parameters of MCH services [5]. The major direct causes of the neonatal deaths are preterm birth, infections, and asphyxia. In a report which was published in The Lancet reported, the major direct causes of the deaths were pre-term birth (27%), infection (26%), asphyxia (23%), congenital anomalies (7%), others (7%), tetanus (7%) and diarrhea (3%)[6, 7, 8, 9].

High neonatal mortality rate in a country reflects the poor availability of quality and quantity of infrastructure and utilization of neonatal care of that country[10]. Improved neonatal care can lead to increased infant survival. To determine the burden of neonatal disease, understand patient needs, planning and organization the present study was undertaken at SKNMC college , Pune to determine the morbidity and mortality pattern of among the neonates admitted to a tertiary care hospital.

1.1 Aims and objectives

To study mortality and morbidity pattern of neonates admitted to a tertiary care hospital

2. Materials and Methods

This retrospective study was carried out by the department of paediatrics at tertiary care hospital, from January 2016 to December 2018.The institutional ethical committee approved the study protocol.
Data collection was done from Record files obtained from obstetric department and NICU of tertiary care hospital.

Inclusion Criteria
All neonates admitted in PNC ward and NICU from January 2016 to December 2018 were included.

Exclusion Criteria
Neonates who were referred due to non availability of beds and surgical intervention were excluded from the study. The study was conducted in the Department of Paediatrics, of SKNMC. All consecutive live-born babies in the period of 3-year were included in the study. All the babies were followed daily in the postnatal wards. In postnatal wards, if any baby was found sick, they were shifted to the NICU for treatment.

All details regarding history, examination, and investigation were recorded in files. At the time of discharge, detailed examination was done and recorded. The primary disease was considered as the final diagnosis even the baby developed complications of the primary disease or having more than one disease.

Preterm—Live born neonate delivered before 37 weeks from 1st day of last menstrual period (LMP) and confirmed clinically after delivery.
LBW (low birth weight)--was defined as birth weight less than 2500 grams.
VLBW (Very Low Birth Weight) -- birth weight of 1000 grams to 1499 grams.
ELBW (Extremely Low Birth Weight) -- birth weight < 1000 grams.

Neonatal infections (sepsis, pneumonia, and meningitis)—These were diagnosed on clinical grounds along with appropriate tests, which include sepsis screen, blood culture, chest radiograph, and cerebrospinal fluid analysis.

Meconium aspiration syndrome (MAS)—this was diagnosed both radio graphically and clinically based on history of being born through meconium stained amniotic fluid, chest radiograph, and respiratory distress persisting beyond 24 hours.

Congenital malformations—these were diagnosed on clinical features and diagnostic facilities like ultrasound, echocardiography, X rays, and Electrocardiography (ECG)

Neonatal jaundice was diagnosed after assessment of serum bilirubin and found to be in pathological zone in age, weight, and gestation.

Sick babies with maternal history of prolonged rupture of membrane (<24 h) or multiple per vaginum examination (>4) or unclean per vaginum examination or Dai handling were shifted to NICU and rest of the babies were shifted to PNC ward. This study did not interfere with the routine management, and no additional intervention was made part of the study. The data thus collected were fed on the computer and subjected to statistical analysis .

3. Observation

Total 12373 deliveries occurred of which 3701 were caesarean delivery. This accounts to CS rate of 29.9%.Total live births were 12239 of which 1194 were preterm which constitutes 9.7% of live births. Total 5096 were low birth weight contributing up to 41.6% of live births. Total still births during study period was 239(1.9%).

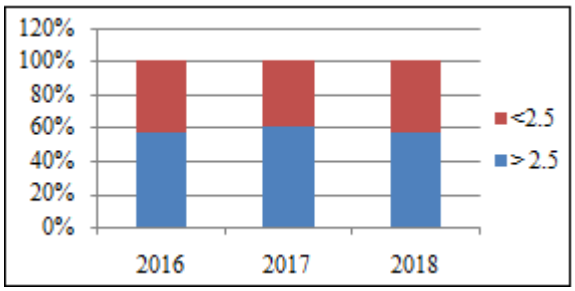

Figure 1: Low birth weight in present study

Table 1: Various modes of delivery

Mode of delivery	2016	2017	2018	Total
Normal (%)	3061 (65.2%)	2656 (63.04%)	2240 (64.62%)	7957 (64.30%)
Caeserean (%)	1407 (29.9%)	1269 (30.01%)	1025 (29.57%)	3701 (29.91%)
Forceps	85 (1.81%)	111 (2.63%)	72 (2.07%)	268 (2.16%)
Vaccum	83 (1.76%)	129 (3.06%)	113 (3.26%)	325 (2.62%)
VBAC	58 (1.23%)	48 (1.13%)	16 (0.46%)	122 (0.98%)
Twins	45 (0.95%)	31 (0.73%)	25 (0.72%)	101 (0.81%)
Triplets	1 (0.02%)	0 (0)	1 (0.02%)	2 (0.01%)
Total	4694	4213	3466	12373

Table 2: Outcome of Delivery

Outcome of delivery	2016	2017	2018	Total
Total births	4741	4244	3493	12478
Still births	110 (2.3%)	76 (1.7%)	53 (1.51%)	239 (1.91%)
Live births	4631 (97.67%)	4168 (98.2%)	3440 (98.48%)	12239 (98.08%)
Full term	4122 (86.94%)	3785 (89.18%)	3138 (89.70%)	11045 (88.51%)
Preterm (%)	509 (11.2%)	383 (9.2%)	302 (9.7)	1194 (9.75%)
Low birth weight	1991 (43)	1625 (39%)	1480 (43)	5096 (41.63%)

Total patients admitted in NICU was 1101 out of which 976 survived with survival rate of 88.4%. Neonatal mortality rate was 10.2 per 1000 live births. Survival rate among LBW 93.4% with 87.33% in VLBW and 52.83% in ELBW Hyaline membrane disease 378, birth asphyxia 131 ,sepsis 139, meconium aspiration syndrome 117, congenital heart disease 60, surgical 52, hyperbilirubinemia 164, extremely low birth weight babies 24. birth injuries 14 were major morbidities. Survival in HMD (87.8%), BA (84.56%), MAS (93.1%), Sepsis (80.6%), CHD(85.9%), ELBW(52.8%).

Table 3: NICU Statistics

	2016	2017	2018	Total
Total live births	4631	4168	3440	12,239
NICU admission	372 (8.03%)	397 (9.5%)	332 (9.6%)	1101 (8.99%)
Neonatal death	44 (0.95%)	46 (1.1%)	35 (1.01%)	125 (1.02%)
NICU Survival	328 (88%)	351 (88.4%)	297 (89%)	976 (88.4%)
ELBW< 1 Kg	5 (1.3%)	11 (2.7%)	9 (2.7%)	25 (2.2%)
VLBW< 1.5 Kg	11 (2.9%)	16 (4.03%)	17 (5.1%)	44 (3.99%)
LBW <2.5 kg	320 (86%)	306 (77.07%)	248 (74.7%)	874 (79.38%)
ELBW< 1 Kg survival	2 (40%)	7 (63%)	5 (55.5%)	14 (52.8%)
VLBW< 1.5 Kg survival	9 (82%)	14 (87.5%)	14 (82.3%)	37 (83.93%)
LBW <2.5 kg survival	294 (91.8%)	280 (91.5%)	238 (96%)	812 (93.1%)
Neonatal Mortality Rate	9.5	11.03	10.6	10.37
Perinatal Mortality Rate	33.2	29.27	25.8	29.42

Table 3: Morbidity data

Major morbidities	2016			2017			2018				Total
	Total	Survival	%	Total	Survival	%	Total	Survival	%	total	(%)
HMD	112	95	84.8	163	144	88.34	103	93	90.27	378	87.8
Hyperbilirubinemia	55	55	100	62	62	100	47	47	100	164	100
Sepsis	62	49	79	33	27	81.8	44	36	81	139	80.6
CHD	21	18	85.7	18	14	77	21	20	95	60	85.9
Birth asphyxia	40	34	85	38	29	76	53	51	92.7	131	84.56
Surgical	16	15	93.7	16	14	87.5	20	20	100	52	93.73
ELBW	5	2	40	11	7	63	9	5	55.6	24	52.86
Birth injury	5	5	100	3	3	100	6	6	100	14	100
MAS	18	17	94.4	14	12	85	8	8	100	117	93.13

Mortality data

Major cause of mortality are due to Hyaline membrane disease(35.66%), Sepsis (31.1%) , Birth asphyxia (13.1%) Extremely low birth weight babies(8.93%), congenital heart disease (6.8%),surgical(2.19%)were major cause of death

Table 5: Mortality data

	2016		2017		2018		Total
	No	%	No	%	No	%	%
ELBW	3	6.8	4	8.6	4	11.4	8.93
HMD	17	38	19	41	10	28	35.66
BA	6	13.6	9	20	2	5.7	13.1
MAS	1	2.27	2	4.3	0	0	3.70
Sepsis	13	29.3	6	13.04	18	51	31.1
Surgical	1	2.27	2	4.3	0	0	2.19
CHD	3	6.8	4	8.6	1	2.8	6.06

4. Discussion

Accurate data on the neonatal disease volume and pattern are useful for many reasons. It is important for the providers of care, investigators, local and national health administrators, and for decision makers to design interventions for prevention and treatment and to implement and evaluate health care programs.

In this study period, out of total 12373 deliveries, 3701 were caesarean which accounts for 29.91% of total. National neonatal and perinatal database has observed CS rate of 28.6[11]. Healthy Newborn network has observed c-section rate from 2011 to 2016 in China 41%, India 17%, Afghanistan 17% and Pakistan which is 14%

Neonatal mortality rate in our study was 10.2 per 1000 live births. Our mortality rate is lower compared to Nepal 26.6% and Kenya 18.7%[13, 14]and higher compared to developed countries like Canada 7.6% which are equipped with better facilities like extracorpeal membrane oxygenation, total parenteral nutrition (TPN) higher doctor to patient and nurse ratio[12]. Perinatal mortality rate was 29.4.

Low birth weight (LBW) in our study was 41.63%, as per SEAR-NPD data LBW babies in Bangladesh(37.9%), India(30.3%) Sri Lanka (19.7%) Nepal (12.3%). Preterm births were 9.75 % and which is comparable to 14.5% National Neonatal-Perinatal database 2002-2003.

Hyaline membrane disease was the most common cause for admission in NICU, followed by hyperbilirubinemia, sepsis, birth asphyxia, meconium aspiration syndrome, congenital heart disease, surgical, extremely low birth weight babies, birth injuries. Hyaline membrane disease (35.66%) was the most common cause of neonatal mortality, which is similar compared to study conducted by Sridhar et al and Rashid et al[14]. In contrast study published by ICMR reports sepsis 32.8% as the major cause of neonatal mortality followed by birth asphyxia 22.3% and prematurity 16.8%. Similar study conducted in JIPMER sepsis was the cause of death 52.3% of neonates followed by birth asphyxia and injuries 29.23% [15, 16].

5. Conclusion

Improvement in neonatal- perinatal survival is a primary health agenda. According to this study RDS , neonatal sepsis, birth asphyxia are leading causes of deaths and NMR IS 10.2 per 1000 births inspite of many advances in neonatal care. Perinatal mortality still continues to be unacceptably high due to maternal undernutrition, anemia, hypertension, lack of basic antennal care. The majority of this mortality and morbidity can be prevented by improving maternal health and timely intervention.

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