Original Article

Causes of Admission and Outcome Among Newborns in Neonatology Ward of Mardan Medical Complex Mardan Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Objective: To study the main causes of admission and outcome among newborns in Nursery ward of Mardan Medical Complex Mardan Khyber Pakhtunkhwa, Pakistan.

Study Design: Retrospective descriptive study

Place and Duration of Study: This study was conducted at the Mardan Medical Complex Neonatology Unit from January 2019 to December 2019.

Materials and Methods: Data of all the neonatal admissions in the nursery unit was recorded in Mardan Medical Complex neonatology unit and analyzed for age, sex, the reason for admission, duration of hospital stay and the final outcome of these patients.

Results: A total of 4759 neonates were admitted to the neonatal unit Mardan Medical Complex. Among them, males were 2285 (48.07%) and females were 2474 (51.99%). The average length of stay was 6.2 days (SD 6 days). According to the data neonatal sepsis represent about 30.95% of all admission in 2019. Neonatal jaundice accounted for 15.17%. Birth asphyxia (15.67%), preterm constitute 10.29%, meconium aspiration syndrome was 5.77%, hypoxic ischemic encephalopathy 4.60%, respiratory distress syndrome 9.81%, hypoglycemia1.32%, hypothermia 2.64%, neonatal seizure 1.22%, tetanus 0.19% and others constitute 2.33% of the admitted cases. Among total admissions 3801 (79.86%) patient were discharged with a satisfactory condition while 958 (20.13%) patient died. The highest number of admitted patient was observed in the month of July 2019 while highest death rate was observed in month of august2019.

Conclusion: This study conclude that the most common causes of the neonatal admission were neonatal sepsis, neonatal jaundice (NNJ), preterm, meconium aspiration syndrome, birth asphyxia, respiratory distress syndrome, hypoxic ischemic encephalopathy, hypoglycemia, hypothermia, neonatal seizure and tetanus. The commonest cause for the mortality was neonatal sepsis, birth asphyxia and neonatal jaundice. There is need of increased awareness in health workers who conduct deliveries at home or in home for time referral to tertiary level hospital.

Key Words: Newborns; Admission; Outcome; Awareness

INTRODUCTION

As neonate face a lot of problems during perinatal period hence it is recognized as the most dangerous period[1]. The high vulnerable time for infant is the neonatal period because in neonatal period the child are completing many physiological adjustments that are required for extra-uterine existence[2]. In developing countries 98% of the death in total death of nine million

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children in world is during perinatal and neonatal period. The contribution of neonatal mortality ranged from 40-70% of infant mortality. Two-third of the infant death in India is due to neonatal death. In the first two days of life about 45% of death occur[3]. Birth asphyxia, sepsis, congenital abnormalities, prematurity, low birth weight and surgical problems are the major causes for neonatal mortality in India. The mortality rate can be decreased by improving the neonatal care[4]. Prematurity and malformation are the major cause of death in advanced countries while in less developed countries the most important causes of neonatal death are infections (29%), prematurity (29%), asphyxia (23%), congenital malformations (8%), and other (11%)[2]. during antepartum or intrapartum approximately half of the perinatal death occur while the rest of the death occur in first week of life in most developing nation state. In developing countries the perinatal and neonatal death occur due to many factors

including poor maternal health, adverse social conditions, and inadequate care during pregnancy, delivery, and the immediate postpartum period[3]. Therefor it is important to measure and monitor the perinatal morbidity and mortality to develop different strategies to improve the perinatal heath care at various level. The instability of life during this period, of all the death occurring, is due to high neonatal mortality and morbidity rate. During the first year of life in the United States, two-thirds are in a birth condition. The death rate for the first year is not comparable by the Rate in any other lifetime to seventh decade [2,4].

There are many causes of newborn admission to neonatal unit as high-risk infants other than prematurity as patients with genetic disorder, blood group sensitization, multiple gestation, intrauterine growth restriction, neonatal jaundice,mother illness such as hypertension, diabetes mellitus and some drug administration during pregnancy, respiratory distress, premature rupture of membrane, bodyweight either Less than 2.500 or greater than 4.000g or birth less than 37 or more than 42 weeks of gestation and congenital malformation[2]. Number of studies have been done on the causes of admission of newborn in which majority of admission is due to low birth weight followed by neonatal infection [5,6]. The important causes for the increased mortality in newborn admission is due to prematurity followed by birth asphyxia than neonatal infection[7]. The high mortality rate of neonate in a country is reflected by many factors including poor availability of quality and quantity of set-up and proper utilization of neonatal care of that country. To define the causes for admission and outcomes among newborn in Pakistan a very limited data is available. We therefore sought to conduct the study in neonatal unit of Mardan Medical complex Mardan Khyber Pakhtunkhwa, Pakistan to determine the causes and outcomes of the admitted newborn. This study will help us in making guidelines and will also prove very fruitful to local health pediatrician and researchers in minimizing mortalities and morbidities associated with the different diseases among newborn patient. This study will be helpful in finding all the gaps in the required infrastructure of neonatal unit of Mardan Medical complex Mardan Khyber Pakhtunkhwa, Pakistan

MATERIALS AND METHODS

This study was done at a neonatal unit of Mardan Medical complex Mardan Khyber Pakhtunkhwa, Pakistan. The study was conducted from 1st January 2019 to 31st December 2019. A hospital based retrospective study was 4759 neonates admitted in the neonatal unit of Mardan Medical complex Mardan Khyber Pakhtunkhwa, Pakistan.

Inclusion Criteria was all newborns with available data admitted in the Neonatal Unit while the Exclusion criteria was Individual recordings in the register which were not properly filled were omitted.

Data collection technique: The data source for our study was the neonatal unit registers at Mardan Medical complex Mardan Khyber Pakhtunkhwa, Pakistan which comprised of neonate information recorded at admission such as date of admission, age, weight of the child, status at birth, diagnosis, treatments given, outcome status and records of maternal information like parity, antenatal follow up, gestational age and mode of delivery. All these data were collected using a uniform extraction format developed by taking in to account all the relevant variables in the standard neonatal unit registers. Mostly clinical sign and symptoms were the base for diagnosis or based on WHO definition for pre-maturity (live born Neonates delivered before 37 weeks from 1st day of last menstrual period(LMP)[8]. Serum bilirubin along with G6PD estimation was done for the diagnosis of neonatal jaundice. Clinical grounds together with the positive blood culture and CSF examination was used for the diagnosis of the neonatal sepsis. Samat-staging was base for the clinical diagnose of birth asphyxia.

RESULTS

The total number of babies admitted to neonatal unit of Mardan Medical complex Mardan KPK from fist January 2019 to 31st December 2019 was 4759 babies Among them, males were 2285 (48.07%) and females were 2474 (51.99%). (Table 1) The average length of stay was 6 days (SD 6 days). (Table 2) Neonatal sepsis was the main cause of admission to neonatal unit. Out of 4759 admitted newborn 1470 newborn (30.95%) were admitted due to neonatal sepsis. Neonatal sepsis was followed by Birth asphyxia (15.67), Neonatal jaundice accounted for 15.17%), preterm constitute 10.29%, respiratory distress syndrome (9.81%), meconium aspiration syndrome was 5.77%, hypoxic ischemic encephalopathy 4.60%, hypothermia 2.64%, hypoglycemia 1.32%, neonatal seizure 1.22%, tetanus 0.19% and others constitute 2.33% of the total admitted cases. (Table 3) Among total 4759 admitted neonate 3801 (79.86%) patient were discharged to their home with a satisfactory condition while 958 (20.13%) patient expired. (Figure 1) Those among the expired patients 958 (20.13%), the major causes of death was neonatal sepsis that constitute 218 patient (22.73%). The other causes of death followed by neonatal sepsis were preterm constitute 22.21%, Birth asphyxia (18.35%), respiratory distress syndrome (14.28%), meconium aspiration syndrome was 7.92%, hypoxic ischemic encephalopathy 6.04%, Neonatal jaundice accounted for 4.06%, hypothermia 0%, hypoglycemia 0% neonatal seizure 0%, tetanus 0.93% and others constitute 3.33% of the total expired cases. (Table 4).

Table No.1: The total number of babies admitted gender wise to the neonatal unit in Mardan Medical Complex

	Male	Female	Total
Total No	2285	2474	4759
percentage	(48.07%)	(51.99%)	100%

Table No.2: Length of stay in the neonatal unit in Mardan Medical Complex

No.	Max.	Min.	Range	Mean	Standard deviation	Variance
4759	31	1	30	6.22,	6.0	36.0

Table No.3: Causes of admissions to the neonatal unit in Mardan Medical Complex

Causes of admission	Frequency	percentage
Neonatal sepsis	1473	30.95%
Preterm	490	10.29%
Birth asphyxia	746	15.67%
Respiratory distress syndrome	467	9.81%
Meconium aspiration syndrome	275	5.77%
Hypoxic ischemic encephalopathy	219	4.60%
Neonatal jaundice	722	15.17%
Hypothermia	126	2.64%
Hypoglycemia	63	1.32%
Neonatal seizure	58	1.22%
Netanus	9	0.19%
Others	111	2.33%
Total	4759	100%

Table No.4: Disease wise mortality pattern among neonates admitted to Mardan Medical Complex

Causes of admission	Frequency (N)	Death	%age
Neonatal sepsis	1473	218	22.73%
Preterm	490	213	22.21%
Birth asphyxia	746	176	18.35%
Respiratory syndrome	467	137	14.28%
Meconium aspiration syndrome	275	76	7.92%
Hypoxic ischemic encephalopathy	219	58	6.04%
Neonatal jaundice	722	39	4.06%
Hypothermia	126	00	00%
Hypoglycemia	63	00	00%
Neonatal seizure	58	00	00%
Tetanus	09	9	0.93%
Others	111	32	3.33%
Total	4759	959	100%
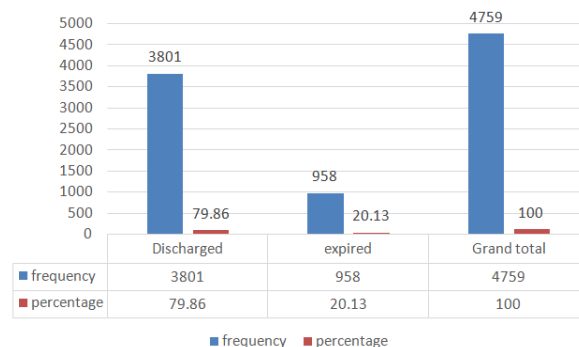
Figure No.1: Outcome of admissions to the neonatal unit in Mardan Medical Complex

DISCUSSION

This study was done to find out the reason for newborn admission and outcome of the causes in children ward of Mardan Medical Complex Khyber Pakhtunkhwa, Pakistan from 1st January 2019 to 31st December 2019. In many developing countries low birth weight is a majorhealthproblem[8-11]. The results obtained from our study shows that the maximum number of newborn patient (30.95%) admitted was due to neonatal sepsis and this in contrast to the other study done in Pakistan by Fazlur R et al.[7] in which the number of maximum patient admitted was due to low birth weight (41.20%). This is also in contrast to another study done by Parkash J et al[6] in which the number of maximum patient admitted was also due to low birth weight (55.4%). In developing countries neonatal infection are the major cause for neonatal morbidity and neonatal mortality[12].The percentage of neonatal sepsis (30.95%) in our study is comparable to the study done by Fazlur R et al.[7] in which neonatal sepsis constitute 26.03% while lower than another study done in Karachi by Parkash J et al (45.21%)[5], and less than the study done by M Hoque et al. (21.0%)[14]. The major factor for the neonatal infection is the home based delivery done by traditional birth attendant under un-hygienic condition. Additionally, in our study the number of cases of birth asphyxia is 15.67% which is in accordance to the study done by Fazlur R et al. (16.52%)[6], while higher than Raghvendra N (12%)[18] and lower than M Hoque et al. (38.2%)[14]. Use of un-sterile delivery practices and poor obstetric care were the main predisposing factors for neonatal infection. Birth asphyxia and neonatal jaundice are next main causes of newborn admission in our study that constitute 15.67%, 15.17% correspondingly. Birth asphyxia result of our study 15.67% is comparable to a study done by Fazlur R et al.[7] (16.52%)[6] and 18.85% in a study done by Parkash J et al[6]. While birth asphyxia in Rawalpindi is reported 31%[15].

Neonatal jaundice constitute 15.17% of the admitted newborn which shows a lower value then the other study done by Fazlur R et al (20%)[6]. From Lahore neonatal jaundice was reported 8.33%[16], and from Bangladesh it was reported 30.71%[16].

According to our study 3801 (79.86%) patient were discharged satisfactorily to their home after proper treatment. This high percentage of discharge newborn patient may be due to better awareness amongst workers of health and all the potential management in spite of having limited resources. According to our study the neonatal mortality was 20.13% which is higher than other study done by Fazlur R et al.[7] in which 14.87% mortality was recorded while our mortality rate was lower than another study done by Parkash J et al[6] in which 25.85% mortality was recorded. Another study was done in Lahore in which a very high mortality rate 34% was recoded[18] which is very high than our study. The mortality rate of the neonate depends upon mainly the critical condition of the neonate at the time of admission[19]. According to our study the major cause of the neonatal death was neonatal sepsis which is 22.73% followed by birth asphyxia which constitute 22.21%. our these results of neonatal sepsis and birth asphyxia are in accordance with the study done by Fazlur R et al.[7] which recorded 14.1% and 21% respectively. According to the study done by Parkash J et al[6] in Karachi, the reported mortality rate due to neonatal infection is much higher (46.44%) than our study while same results were figured in a study from India[20]. Furthermore, in our study the average length of stay of neonate admitted to our neonate unit was 6.2 days which is in accordance to a study done by M Hoque et al.[14] in which an average stay of 9.2 days was reported. Immediate intervention and early recognition of neonatal problems led to rare complication and sequelae. In order to get better outcomes, it is necessary to do thorough examination of neonate just after birth for early recognition and timely referral of surgical condition.

CONCLUSION

According to our study the number of admitted neonate due to neonatal sepsis are comparatively high as compared to other causes of admission. The mortality rate in our study was generally low but higher for the neonate with neonatal sepsis. These results are in accordance with the other studies from the developing countries. The death rate are avoidable significantly due to postpartum, intrapartum and antenatal care. The major factor for the neonatal infections are the home based delivery done by traditional birth attendant under un-hygienic condition. Use of un-sterile delivery practices and poor obstetric care are the main predisposing factors for neonatal infection. In order to reduce the high case morbidity and mortality it is mandatory to have antenatal and intrapartum monitoring, referred on time and resuscitation at the time of birth. There is need of increased awareness in health workers who conduct deliveries at private clinic or in home for time referral to tertiary level hospital.

Author's Contribution:

Concept & Design of Study:	Kiramat Ullah
Drafting:	Mohammad Fazil
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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