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A DESCRIPTIVE OBSERVATIONAL RESEARCH ON DEATH OF HOSPITALISED NEONATES AND ITS ASSOCIATION TO PREMATURITY, SEPSIS & BIRTH ASPHYXIA

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Abstract:

Objective: *We aimed to study the neonatal hospitalisation spectrum with their outcomes in the setting of tertiary healthcare setup.*

Material and Methods: *Our descriptive-observational research was carried out at Allied Hospital, Faisalabad from February 2016 to March 2017. The data was analysed & reviewed in terms as the cause of admission, weight, gender, age at presentation, gestational age & their result. (Neonates) having incomplete data were not included consequently. By using SPSS, data was analysed & diagnosed based on laboratory investigations, radiological findings & clinical examination.*

Results: *In this research, total 11427 neonates were admitted in which 397 were not included due to unavailability of record. In total 11030 neonates, 3353 were females at 30.4% & 7673 were males at 69.6%. Full-term neonates were (8123) at 73.64% & 2907 were preterm at 26.35%. 5636 were low birth weight babies at 51.1% & 1478 were new-borns taken in the first 24 hours of life at 13.4%. Moreover, 3518 were birth asphyxia at 31.89% & it was the usual reason for admissions in hospital & followed by 2907 prematurity at 26.36% & 1865 neonatal sepsis at 16.91%. In total 11030 babies, the rate of discharge was 7055 at 64%, 2805 at 25.4% left on medical advice & expired neonates were 1170 at 10.6%. Prematurity was the cause of the highest rate of mortality 469 at 39.32% & followed by (asphyxia neonatorum) 359 at 30.68% & (neonatal sepsis) were 180 at 15.38%.*

Conclusion: *In our neonatal unit, prematurity, sepsis & birth asphyxia makes three fourth (hospital admissions). The usual reason for death was prematurity & followed by neonatal sepsis & birth asphyxia.*

Keywords: *Tertiary, Sepsis, Prematurity, Neonatal Intensive Care, Birth Asphyxia.*

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INTRODUCTION:

Of first four weeks of life, mortality rates & neonatal morbidity shows the effectiveness of health services in which (neonatal period) is the mostly vulnerable duration of survival of child [4]. An estimated 140 million children born annually, in (neonatal period) 2.7 million die which is 45% of under-five (deaths worldwide) [2, 3]. As (Millennium Development Goals) were decided in which child mortality was reduced yet it was not sufficient to attain (MDG-44) [5]. Almost 12.6 million children were reported dead before turning to five back in 1990; which was restricted to 5.9 million back in 2015 all over the world [2, 3].

Deaths by neonatal raised from 40% in 1990 to 45% in 2015 [2]. MDG ended in 2015 & now the world has consented upon new methods i.e. (Sustainable Development Goals) SDGs [2, 3]. It is identified that neonatal deaths must be reduced otherwise SDG goals are not possible to reduce (< 5 years) mortality. The projected objective of SDG about the neonatal mortality is to global new births till 2030 and to prevent the death rate per thousand as less than twelve deaths per thousand [3].

Worldwide, 24% birth asphyxia, 35% preterm births & 24% infections account for 83% of (neonatal deaths) [3]. Pakistan has largest (neonatal deaths) having almost 245,000 neonatal annual deaths & 46 per thousand live births were reported (neonatal death rate) [1]. In 1990, in Pakistan share of (neonatal death) in <5 death rate was 47% & enhanced to 57% in 2016. It shows a dangerously slow pace towards decreasing <5 death [2, 3]. In Pakistan, for 87% of (neonatal deaths), three main reasons are 27% infection, 21% asphyxia & 39% prematurity are responsible [3]. Identifying common causes & document number & rate of deaths is the first step in improving (neonatal survival) [6].

SUBJECTS AND METHODS:

Our descriptive-observational research was carried out at Allied Hospital, Faisalabad from February 2016 to March 2017. The data of all patients were collected during their period of admission from the unit in admission register. The qualitative data as outcome i.e. (neonate was discharged), (left after medical advice) or died, final diagnosis or gender and quantitative data as weight, age & (gestational age) were recorded on a form.

The neonate is called a child till first four weeks of life (< 2.5 kg birth weight) was taken as low weight at the time of birth & preterm or premature was defined (liveborn neonate) before 37 completed weeks. With particular (radiological findings) or laboratory, identification was mainly clinical & identification of (birth asphyxia) was based on the history of (late-cry after birth). Both history & examination assisted by C reactive proteins, complete blood count with platelets & positive blood, urine or (cerebrospinal fluid) culture was used for identification of sepsis.

By history & examination was suspected (congenital heart disease) & was ensured with echocardiography & x-ray. Loose stools were taken as acute watery diarrhoea (AWD). Respiratory distress and chest radiograph identification at the time of birth were taken as meconium aspiration syndrome which was helpful in the diagnosis of pneumonia.

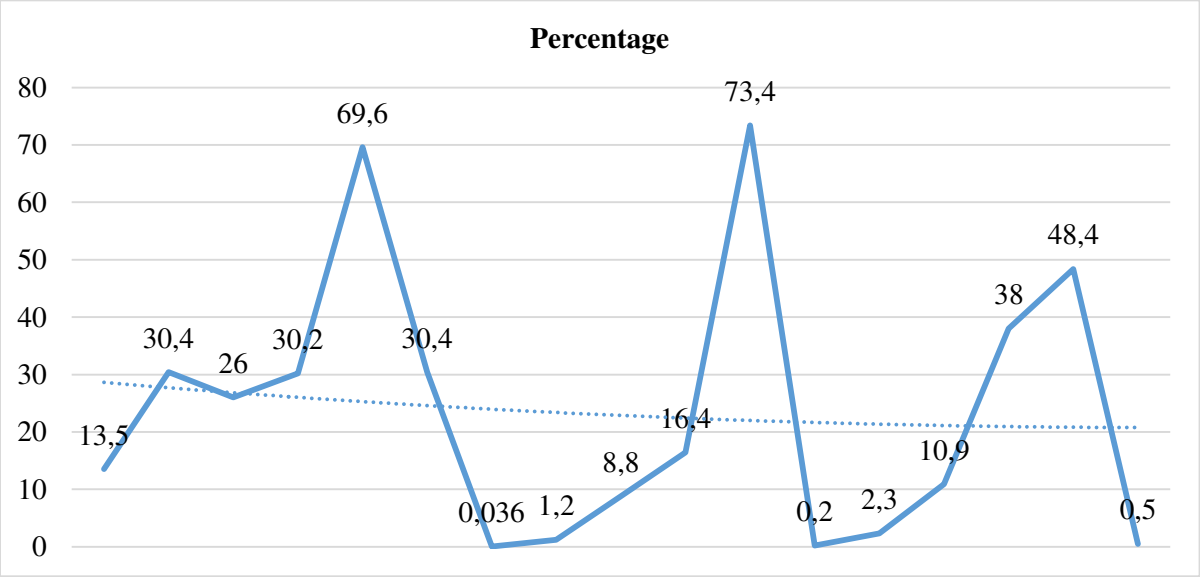
After assessing (serum bilirubin), neonatal jaundice was identified. Which was taken in the zone of pathology as weight and age (gestation range). Various neonates also presented features of the syndrome and congenital anomalies. In others were included: renal failure, seizure disorder, (respiratory distress syndrome), pyomeningitis, (metabolic fits), (infant of the diabetic mother) & (bleeding disorders). It was identified clinically & ensured with present investigations of the laboratory.

RESULTS:

In this research, total 11427 neonates were admitted in which 397 were not included due to unavailability of record. In total 11030 neonates, 3353 were females at 30.4% & 7673 were males at 69.6% & in ratio of 2.2:1. 8123 were full-term neonates at 73.64% & 2907 were preterm at 26.35%. 5636 were low birth weight babies at 51.1% & 1478 were new-borns taken in the first 24 hours of life at 13.4% (Table – I).

Table – I: Demographic data

Variables		Number	Percentage
Age (days)	< 1 day	1478	13.5
	1 - 3 days	3349	30.4
	4 - 7 days	2873	26
	8 - 28 days	3330	30.2
Gender	Male	7673	69.6
	Female	3353	30.4
	Undetermined	4	0.036
Gestational age (weeks)	< 28	129	1.2
	28 - 31	971	8.8
	32 - 36	1807	16.4
	37-42	8098	73.4
	> 42	25	0.2
Weight(kg)	< 1	249	2.3
	1 - 1.5	1198	10.9
	1.51 - 2.4	4189	38
	2.5 - 4	5342	48.4
	4	52	0.5



Moreover, 3518 were birth asphyxia at 31.89% & it was the usual reason for admissions in hospital & followed by 2907 prematurity at 26.36% & 1865 neonatal sepsis at 16.9 %. In total 11030 babies, the rate of discharge was 7055 at 64%, 2805 at 25.4% left on medical advice & expired neonates were 1170 at 10.6%. Prematurity was the cause of highest rate of mortality 469 at 39.32% & followed by (asphyxia neonatorum) 359 at 30.68% & (neonatal sepsis) were 180 at 15.38%. The (bronchopneumonia) 587 at 5.32% was other common cause of hospital admission with (jaundice neonatorum) 527 at 4.78% & (congenital heart diseases) 356 at 3.23% (Table – II).

Table – II: Spectrum of neonatal admissions and their outcome

Diagnosis	Discharge		Death		LAMA	
	Number	Percentage	Number	Percentage	Number	Percentage
ANN	2236	63.6	359	10.2	923	26.2
CHD	212	59.6	40	11.2	104	29.2
Prematurity	1554	53.5	460	15.8	893	30.7
JNN	427	81	22	4.2	78	14.8
Sepsis	1220	65.4	180	9.7	465	24.9
AWD	291	88.7	5	1.5	32	9.8
Pneumonia	456	77.7	30	5.1	101	17.2
MAS	142	62.8	23	10.2	61	27
Syndromic/ malformation	120	66.7	17	9.4	43	23.9
Others	397	74.1	34	6.4	105	19.6
Total	7055	64	1170	10.6	2805	25.4

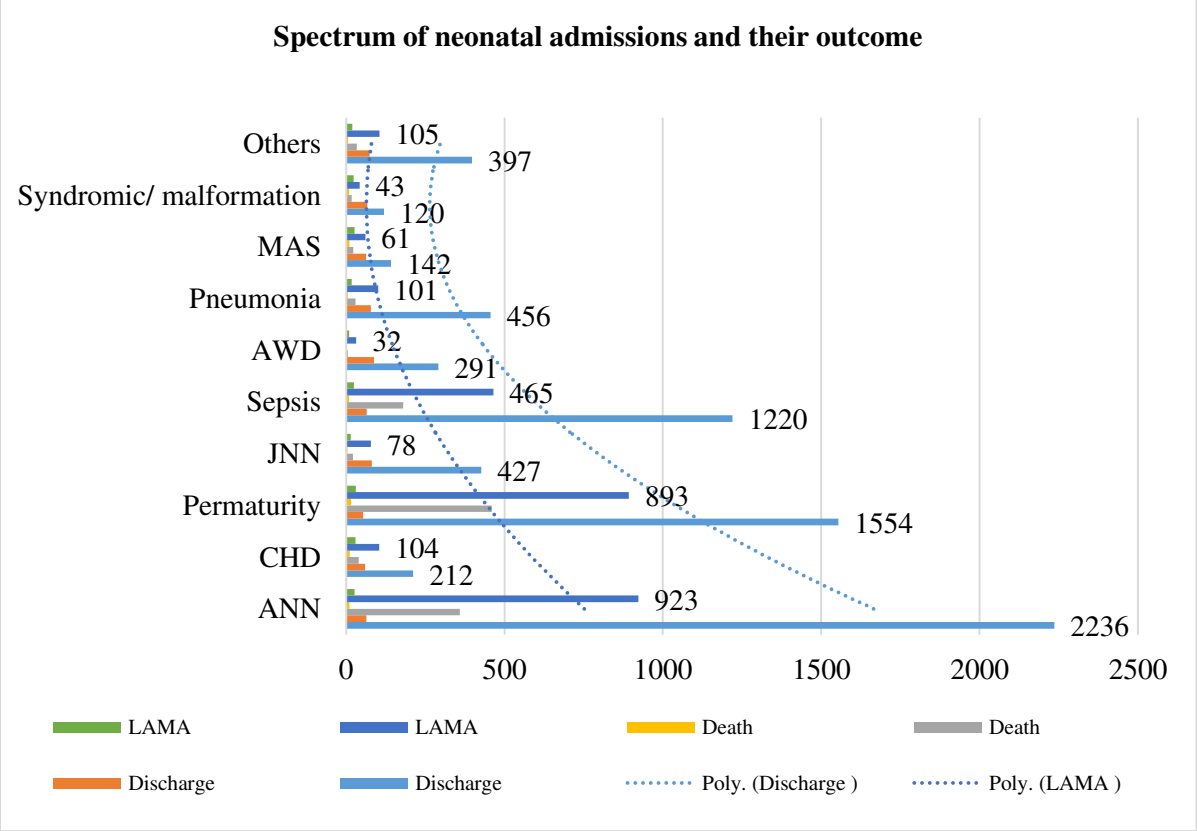
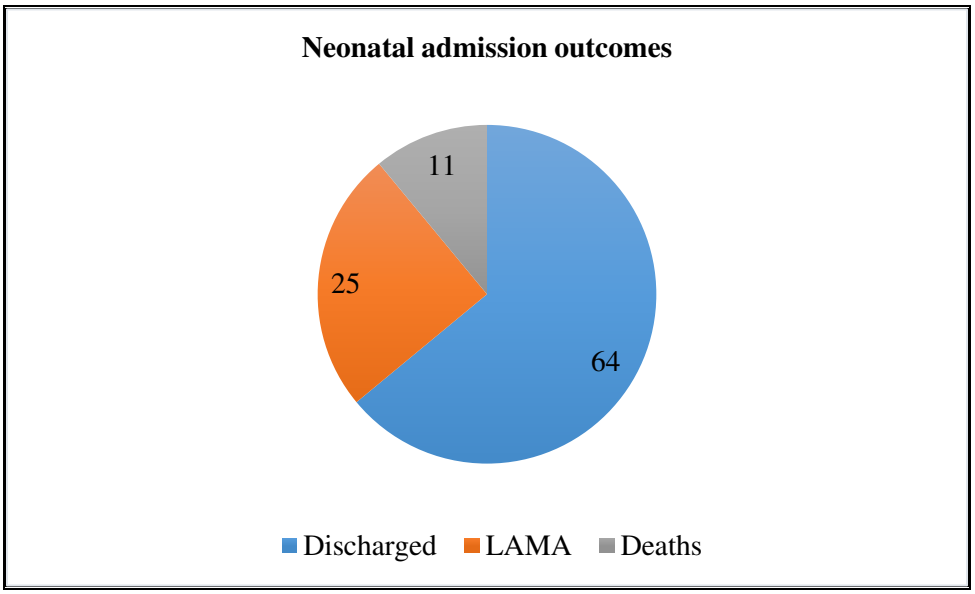


Table – III: Neonatal admission outcomes

Outcomes	Percentage
Discharged	64
LAMA	25
Deaths	11



DISCUSSION:

This research explains the results of 11030 continuous admissions were studied. Both (JAN et al.) & (Hussain et al) observed predominance of male in research performed on system of admissions & their result in (neonatal units) [6, 7] & male predominance was also observed in same researches performed by Shah GS & Mmbaga & Kanodia [5, 8, 9].

In all regions, gender bias to (male babies) is a (universal phenomenon) & thus male children usually seek (medical attention) and are detected of (neonatal issues) [5, 10]. In our study, the males were more 2.2 times in comparison to (female neonates).

The crucial period is the first 24 hours as neonate adapts to (extra-uterine) environment so it bears many (neonatal problems) in this time period [11]. Thus, mostly neonates present to hospital in 1st 24 hours of their life & as observed by 81.3% Begum et al, 56% Kanodia et al & 62% Shakya et al. [5, 11, 12].

It was during admissions in our research reported as 13.7% & clearly lesser than above studies. As our unit is (referral unit) & receives babies only outborn and mostly neonates present later so it might be the reason for the difference. The occurrence of (low birth weight) babies globally is 15.5% in which 96.5% are from (developing countries) [13]. Such countries include Pakistan 19%, 30% India, 22% Sri Lanka & 30% Bangladesh [13]. These babies requiring admission in the healthy facility is observed as 55.3% in Bangladesh & 60.62% in India & is comparable with our outcomes which were 51.2% [14, 15]. Such same admissions in the hospital could be because of greater birth rates & factors involved in the birth of (LBW babies) like anaemia, jaundice, hypocalcaemia, apnea, infections, hypoglycaemia, hypothermia, socioeconomic condition, education and vulnerability of (LBW babies) to (respiratory issues) & maternal health.

Admission pattern on neonatal changes from place to place but literature review showed that neonatal sepsis, birth asphyxia & prematurity common cause death & morbidity of newborns [3, 16, 18]. Quddusi, Begum & Kanodia also observed the same three causes of usual indication of (hospital admissions) in Multan, Bangladesh & Nepal respectively [5, 12, 18].

In our research, we observed 16.91% neonatal sepsis, 31.89% birth asphyxia (ANN) & 26.36% prematurity as a usual indication for (hospital admission) & are almost same as local researches & neighbouring countries. A global (perinatal problem) is (birth asphyxia) & clearly causes both (neonatal morbidity)

& death as by (birth asphyxia) worldwide, one-fourth of (neonatal deaths) occur [3].

The (institutional delivery) rate in Sri Lanka is 99% & 98% which are performed by an expert (birth attendants) leading to (birth asphyxia) rate of just 12% [1, 2]. At Multan 34.5% & Rahim Yar Khan 36.6%, the data of (neonatal units) depicts greater happening of (birth asphyxia) & is almost same as our outcomes as 31.89% [18, 19]. Such higher (asphyxiated babies) in Pakistan is due to just 48% deliveries are performed by (traditional birth attendants) but other 52% are by outside (health institutions) which never have required skills & facilities of (neonatal resuscitation) [1, 2].

The rate of prematurity is lesser as nine percent in developed & greater as 12% in (developing countries) [17]. Pakistan is at eighth number having a rate of 15.8% in the top ten countries with a greater rate of (preterm birth) [17].

The (preterm babies) make 27.9% hospital admissions by in a study by Ali in Hyderabad & 20% a study by Qaddusi in Multan because these (neonatal units) have same care level as ours needed for such preemies [18, 20]. Our research is having 26.36% of total hospitalised cases taken as preterm. While reduced preterm baby's influx was observed as 13% by Narayan & 6.5% by Shakya is less than our outcomes [11, 21].

The variation could be due to their units are (level-II nurseries) which have lesser facilities then mostly such children are sent in (greater centres). The (neonatal sepsis) is the main issue for the management of caregivers particularly in (developing countries) [22]. It's happening is observed to be 22.5% in Egypt, 34.5% in Nepal & 38% in India [10, 23]. The cause of such a greater percentage than our research is due to infection including bronchopneumonia, neonatal sepsis, meningitis and numerous related infections. Sepsis has 16.9% of hospitalised cases in our research which is to a local research that reported 17% [24].
Such lesser percentage is because we counted just those children having surely diagnosed with (generalized sepsis) and others were recorded separately having bronchopneumonia, meningitis, minor infections & AWD. In total (11030 babies), 2805 at 25.4% were left on (medical advice), 7055 at 64% were discharged when recovered & 1170 at 10.6% died.

The death rate of our research is almost same with (local data) observed from Peshawar as 8.3%, Multan at 8.14% while is lesser than Larkana at 38% & Karachi at 25.85% [7, 18, 24]. Such difference could be because of variation in facilities available & study population of (neonatal unit). The major reasons of death in our research were sepsis as 15.38%, prematurity as 39.32% & asphyxia neonatorum as 30.88% and are always consistent due to (community- based studies) & (health facilities) from lesser (resource countries) [3, 10, 21].
The total number of children we receive are commonly referred to without ventilation, oxygenation, temperature maintenance & stabilization which causes greater deaths in (sick neonates). The ratio of leaving babies on (medical advice) in hospitals differs in literature from < 1% up to 30% or maybe more [16].
The strength of children left against medical advice in research from Saudi Arabia as 1.6% was very lesser than Multan as 20.2% & India as 25.4% [16, 18, 25]. Such difference is due to factors like (health policy of regional government), study settings & (sociocultural factors). Even then observed happening of (LAMA) is 25% which is almost the same as (regional studies).

Our research shows that leaving hospital by parents (against medical advice) is due to various causes as gap of communication between (health care providers) & parents, disliking environment of hospital, personal/financial problems, family, dissatisfaction of care in medical perspectives, preferring other hospital, false perception about condition which considered as terminal [16, 18, 25].

CONCLUSION:

In our neonatal unit, prematurity, sepsis & birth asphyxia makes three-fourth of (hospital admissions). The usual reason of death was prematurity & followed by neonatal sepsis & birth asphyxia. Against (medical advice), one-fourth neonates are left.

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