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Determinants of Neonatal Mortality in Aminu Kano Teaching Hospital Kano, Nigeria

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Abstract:
Neonatal mortality rates remained a public health problem in developing nations, especially in sub-Saharan Africa heavily associated to poverty and poor access to health service. Identifying the etiology of neonatal mortality is a strong indicator to decreasing the neonatal mortality rate in Nigeria. Nigeria continues to have one of the highest rates of neonatal deaths in Africa, therefore, this study aimed at identify risk factors associated with neonatal death in North- Western Nigeria. A retrospective survey was employed for the study and an adapted World Health Organization instrument was used for data collections. A sample size of two hundred and fifty five was employed for the study. The subjects were recruited from hospital records department of Aminu Kano Teaching Hospital. The data were analysed using descriptive and inferential statistics The results showed that the maternal socio-demographic variables associated with neonatal mortality are; poor antenatal visits and low socio- economic status. The study also revealed, sepsis, prematurity and asphyxia in decreasing frequency as the leading causes of neonatal death with sepsis being the independent determinant of neonatal mortality P< 0.05. The study concluded that, sepsis being the independent determinant of neonatal mortality and therefore, it is recommended that there is need for improved obstetric services, monitoring and evaluation with frequent reporting on the major determinants of neonatal mortality to the hospital management

Introduction

Neonatal mortality has been recognized as a global public health burden mostly concentrated in low- and middle-income countries (Lawn et al. 2012).The majority of these deaths are caused by preventable or treatable diseases, such as infectious diseases, which contribute to approximately 36% of these deaths. Previous study have shown that there is a global decline in neonatal mortality rates compared with infant and under-5 years of age mortality, especially in the sub-Sahara African region (Rajaratnam, et al., 2010). The neonatal mortality rate consists of early and late neonatal mortality, with the first representing the main component that reflects the health care provided to pregnant women in the ante partum period, at delivery, and also the care given to the newborn soon after birth and in neonatal units (Almeida, Guinsburg, Martinez, Procianoy,Leone, & Marba, 2012). Available evidences suggested that early neonatal deaths occur during the perinatal period, and have obstetric origins, similar to those leading to stillbirths. Globally, it is believed that, there are over 6.3 million perinatal deaths each year, and almost all of which occur in developing countries, and 27% of them in the least developed countries UNICEF and WHO 2014 . In low income countries, nearly over 40% of deliveries occur in health facilities and little more than one in two takes place with the assistance of a doctor, Midwife or qualified nurse (Oestergaard et al., 2009). High neonatal mortality rates remain a public health problem in developing nations, especially in sub-Saharan Africa because of poverty and poor access to health services

Neonatal mortality has been found to be declining globally but more slowly than post-neonatal (1-59 months) mortality UNICEF 2014. Various reports on neonatal mortality associated significant proportion of under-five deaths that occur during the neonatal period is increasing as under-five mortality declines, however, the health interventions needed to address the major causes of neonatal

deaths generally differ from those needed to address and protect maternal health (UNICEF, WHO, 2014). Existing literature has established that early neonatal deaths occur during the perinatal period, and have obstetric origins, and similar to those leading to stillbirths. More so, it is a common knowledge that globally, there are over 6.3 million perinatal deaths each year

Methodology

A Retrospective survey was employed for the study. The study was carried out at the Special Care Baby Unit (SCBU) of Aminu Kano Teaching Hospital (AKTH). The hospital is located within Kano metropolis, Kano State, North-western Nigeria. The hospital serves as a referral centre for both private and public health institutions in and around Kano. The hospital is projected to serve about six hundred thousand patient outflow annually, with multiple ethnic variations. Target population were neonates, admitted into the Special Baby Care Unit of Aminu Kano Teaching Hospital, Kano between January and December, 2015 formed the target population. The sample size was determined from the total number of neonatal deaths that occurred within the year 2015, based on the Krecie Morgan Formula. The study employed a systematic sampling technique to meeting the objectives of the study.

The data were collected based on the WHO standardized data collection form.

The data collected was analysed descriptively (frequency, charts, percentage, figures) and inferentially (odd ratio) using statistical package for the social science (SPSS) software programme 20.0 version. Ethical consideration was sought and granted by the research ethical committee of the hospital.

Results

Table 1: Distribution of subjects by socio-demographic characteristics

Variable	Frequency (N=255)	Percentage (%)
Age (in days)		
0-7	191	74.3
8-28	64	25.7
Gender		
Male	131	51.4
Female	124	48.6
Place of birth		
Hospital labor ward	39	15.3
Home	201	78.8
Operating Theatre	15	5.9
Total	255	100
Religion		
Islam	233	91.4
Christianity	22	8.6
Tribe		
Hausa	213	83.5
Fulani	20	7.8
Yoruba	8	3.1
Igbo	9	3.5
Others	5	2.0
Parental educational status		
Western education	102	40.0
Non western education	153	60.0
Parental economic status		
Working class	114	44.7
Non working class	141	55.3

Table1 above shows that most of the neonatal deaths 191 (74.3%) occurred between the age of 0-7 days and most were males 131 (51.4%) with the mean of age of 1.3 . With respect to place of birth, majority of the subjects 201(78.8%) had home delivery, most of them were Muslims (91.4%) and Hausas by tribe 231(83.5%). With respect to parental education, most of their parents 153 (60%) had no Western education and fall within the non working class 141 (55.3%).

Table 2: Neonatal factors associated with neonatal mortality

VARIABLES	FREQUENCY (N=255)	PERCENTAGE (%)
Neonatal temperature		
Normal	161	63.1
Low	26	10.2
High	68	26.7
Birth weight (kg)		
< 1.5	45	17.5
1.5- 3.5	192	74.7
> 3.5	18	7.8
Co morbid condition		
Present	101	39.6
Absent	154	60.4
APGAR Score at 5 min		
≤7	169	66.3
≥7	86	33.7

Table 2 Shows that most 195 (74.7%) of the neonates had normal birth weight with mean weight of 2.0kg, normal admitted temperature 161 (63.1%), and majority 169 (66.3%) had Apgar score of ≤7 at 5 minute, with 101 (39.6%) of the neonates had co morbid condition.

Table 3: Maternal factors associated with neonatal mortality

VARIABLES	FREQUENCY(N= 255)	PERCENTAGE (%)	p-value	Odd ratio
Maternal age(years)				
<18	12	4.7	0.41	0.8
18 – 35	195	76.5	0.234	0.8
>35	48	18.8	0.32	0.4
Maternal infection				
Present	44	17.3	0.02	2.0
Absent	211	82.7	----------	-------
Maternal co morbid				
Hypertension	77	30.2	0.425	1.00
Diabetes	28	11.0	0.43	0.2
Anaemia	52	20.4	0.333	0.6
None	97	38.0	0.12	0.6
Others	1	0.4	------	-------
ANC Visit				
Yes	183	71.7	-------	--------
No	72	28.3	0.926	2.0
Intrapartum complication				
Obstructed labor	42	16.5	0.45	0.6
Haemorrhage	10	3.9	0.54	2.0
Mal-presentation	60	23.5	0.42	0.2
Others	17	6.7	0.32	0.31
None	126	49.4	---------	-------

Table 3 above shows that majority of the mothers 195 (76.5%) are within the child bearing age, 77(30.2%) had hypertension while 52 (20.4%) had anaemia. Majority of the mothers 183 (71.1%) attended Antenatal Clinic while 60 (23.5%) had mal–presentation, 42 (16.5) had obstructed labor during delivery; others are reflected in the table.

Table 4: clinical conditions associated with neonatal mortality

VARIABLES	FREQUENCY (N=255)	PERCENTAGE (%)	Df	P -Value
Asphyxia				
Present	93	36.5	1	0.42
Absent	162	63.5	------	--------
Prematurity				
Present	100	39.2	1	0.33
Absent	155	60.8	--------	-------
Sepsis				
Present	108	42.4	1	0.02
Absent	147	57.6	-------	--------
Congenital anomaly				
Present	48	18.8	1	0.92
Absent	207	81.2	-------	---------
Neonatal jaundice				
Present	50	19.6	1	0.24
Absent	205	80.4	---------	---------
Neonatal tetanus				
Present	6	2.4	1	0.45
Absent	249	97.6	----------	--------

Table 4 shows that 93 (36.5%) presented with asphyxia while 100 (39.2%) presented with prematurity. 108 (42.4%) of the neonates had sepsis, while congenital abnormality and neonatal jaundice occurred at similar rates of 18.8% and 19.6% respectively

Discussion

In this study, males gender were found to be more at risk of neonatal death than female neonate. Similar demographic observation was reported in South-Western Nigeria (Ezeh et al 2014). This finding could be due to the theoretical assertion that male babies are more susceptible to premature death than female neonates perhaps due to genetic disposition of x- chromosome that confers immunity to female neonates than the male counterparts. Another possible reason for the lower rate of neonatal deaths among female neonate could be related to development of early foetal lung maturity in the first week of life, which in turn results to respiratory diseases benefit in female neonates compared with male neonates.

The study also, found that two-thirds of the neonatal deaths occurred within 0-7 days of life with the mean of 24-72 hours, this finding seems to be contrary to the report around the world which showed higher neonatal death within the first 24 hours of life (Eveline et al., 2016).

In addition, the study revealed that the major maternal health problem related to neonatal mortality are maternal hypertension and anaemia ,similar findings was reported around the world (Tyson, et al., 2008). The possible explanation to this findings could be related to the increase tension on blood supply in the maternal circulation that might interfere with normal foetal perfusion, thereby increasing the risk of neonatal death. However, a contrary report on maternal health problem associated with neonatal mortality was found to be intra-partum haemorrhage (WHO 2006). The present study also, revealed that failure of antenatal visits, and intra-partum problems have increased risk of neonatal mortality by two folds OR [2]. This findings is not unique to this study, similar finding was documented in many part of the worlds which showed that intra-partum problems, high blood pressure, breech presentation, antenatal corticosteroid therapy have increased risk of neonatal mortality by five folds (Elahi et al,. 2005,Tyson,Parich,Langer,Green & Higgens 2007)

The study also showed that low educational level, high parity and null parity are associated with increased risk of neonatal mortality, this findings is also similar to the report in some part of the world (Carl & Kenneth 2012).The reason for this could reflect deviance from the normal uterine function. In another study ,pre mature rupture of membrane, maternal malaria and infection are the leading causes of neonatal mortality (Iyoke et al,. 2014).

The major finding in this study is that, maternal sepsis is an independent determinant of neonatal mortality, this finding is in agreement with the report from Iran by Hamidah, Hamid, Zahra ,Zahira and his colleagues (2014).

Conclusion

It is concluded that sepsis is the independent determinant of neonatal mortality among the studied group and therefore, recommended the need for improved obstetric services and health education to curbing the predictors of neonatal mortality rate.

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