

Original Research Article

A STUDY OF NEONATAL MORTALITY IN A SPECIALIST HOSPITAL IN GUSAU, ZAMFARA, NORTH-WESTERN NIGERIA

Abstract

Introduction: The first 28 days of life is a critical time for survival of any child; more than 4 million newborns die yearly within the first four weeks of life with 3 million of these deaths occurring in the early neonatal period. Nigeria's neonatal mortality rate is the highest in Africa and second highest in the world.

Objectives: This study determined the causes of neonatal mortality and mortality rate among newborns admitted to the special care baby unit (SCBU) of a specialist hospital in Gusau, Zamfara State, Nigeria.

Materials and methods: A retrospective descriptive study of causes of mortality among newborns admitted into the SCBU over a three year period. Case notes of all mortalities were reviewed and data on place of birth, age on admission, diagnosis and duration of hospital stay.

Results: A total of 853 neonates were admitted, of which 20.4% died. Males predominated (56.9%) and 56.3% died within the first 24 hours. The leading causes of death were birth asphyxia 65(37.4%), prematurity 45(25.9%) and neonatal sepsis 42(24.1%). Odds of mortality when born outside the hospital was not significant when compared with those born inside the hospital (OR=1.26, 95% CI= 0.86-1.85, $P=.22$).

Conclusion: The mortality rate observed in this study was high, occurred within the first 24 hours of life and attributable to preventable causes. Health education on importance of hospital delivery by trained personnel is advocated. Early presentation to health care facility with sick neonates is highly recommended.

Key words- neonatal, newborns, mortality, Zamfara

1. Introduction

The first 28 days of life (the neonatal period) is a critical time for survival of any child [1]. It has been estimated that more than 4 million newborns die yearly within the first four weeks of life, with 3 million of these deaths occurring in the early neonatal period. Sadly, 98% of these deaths occur in developing countries [1].

Globally, neonatal mortality rate has reduced steadily from 1990 to 2015, with a decline in the neonatal deaths [2]. However, the decline in neonatal mortality during that period has been slower than that of post-neonatal under-five mortality [2,3].

In 2013, globally an estimated 6.3 million children died before reaching the age of five years of which 44% died within the neonatal period. Furthermore, 73% of all neonatal deaths occurred within the first week of life with 36% occurring on the day of birth [4].

In developing countries, the risk of death in the neonatal period is six times greater than in developed countries; and over eight times higher in the least developed countries [1]. The risk of neonatal death is highest in Africa, having 41 neonatal deaths per 1000 live births [1].

In Nigeria, about 700 babies die daily (around 30 every hour) which is the highest in Africa, and second highest in the world, hence ranks Nigeria contributes about 8% of the world's annual neonatal deaths [3].

Early neonatal deaths are due to obstetric origins while intra partum deaths are closely linked to place of delivery and care at delivery [1]. In most developing countries, about 40% of deliveries occur in health facilities and few actually takes place with the assistance of trained health personnel [1].

There has been no published hospital based study in Zamfara State that documented the pattern of neonatal mortality. In view of this, the study was aimed to identify the causes of neonatal mortality and mortality rate among newborns admitted to the special care baby unit (SCBU) of Ahmad Sani Yariman Bakura Specialist Hospital (ASYBSH), Gusau, Zamfara State, Nigeria.

2. Materials and methods

2.1 Methods

The ASYBSH is a specialist hospital of the Zamfara State Government which commenced work on 18th March 2013. This is a retrospective descriptive study of causes of mortality among newborns admitted into the SCBU over a three year period between April 2013 and March 2016.

The case notes of all mortalities were reviewed and information retrieved included place of birth i.e. within (inborn) and outside (outborn) our hospital, age on admission, duration of hospital stay and diagnosis at time of death (not primary cause of death).

The SCBU is managed by 1 permanent Consultant who also manages the emergency paediatric unit and paediatric medical ward, 2 visiting Consultants, 1 medical officer, 1 house officer and 7 nurses. Available facilities in the unit include 10 cots, 2 incubators and 2 phototherapy units, due to the lack of space; inborn and outborns are not separated. However, there are no facilities for mechanical ventilation, blood gas analysis or intensive monitoring.

2.2 Ethical approval

Ethical approval was obtained from the hospital ethical committee.

2.3 Data analysis

The data was analyzed using Statistical Package for Social Sciences software version 20, for cleaning and analysis (SPSS Inc., Chicago, IL, USA). Categorical variables were analyzed using the Chi-square test and Fisher's exact test (for sample size less than 5 in a cell) for association between categorical variables. The level of statistical significance was set at $P = .05$.

3. Results

A total of 853 neonates were admitted during the study period, of which 174 died; giving a mortality rate of 20.4%. There were 99 males and 75 females, giving a male: female ratio of 1.32:1. The mean age at admission was 3.32 ± 0.06 days, minimum age of admission was at birth and maximum age was at 28 days.

Inborn neonates were 77(44.3%) while outborns were 97(55.7%). More males died in both inborn and outborns categories, however it was not significant ($\chi^2=1.38$, $P=0.24$).

Half of the newborns died less than 24 hours of admission, while 95.4% died within seven days as shown in table 1 below.

Table 1: Duration of admission

Duration	Frequency	Percentage
<24 hours	98	56.3
24-48 hours	41	23.6
3-7 days	27	15.5
8-14 days	7	4.0
>14 days	1	0.6
Total	174	100

The mean duration of hospital stay was 1.78 ± 2.47 hours, with a minimum of 20 minutes and maximum of 16 days.

Birth asphyxia, prematurity and neonatal sepsis were the commonest causes of mortality as shown in table 2 below.

Table 2: Causes of mortality

Diagnosis	Frequency	Percentage
Birth asphyxia	65	37.4
Prematurity/ low birth weight	45	25.9
Neonatal sepsis	42	24.1
Congenital malformations	7	4.0
Neonatal tetanus	6	3.4
Meconium aspiration syndrome	5	2.9
Rhesus isoimmunisation	1	0.6
Ichthyosis	1	0.6
Subgaleal haemorrhage	1	0.6
Persistent hypoglycaemia	1	0.6
Total	174	100

More males died from asphyxia, sepsis and prematurity; however it was not significant ($\chi^2=0.67$, $P=0.71$).

The odds ratio of mortality when born outside the hospital was not significant when compared to those born inside the hospital (OR=1.26, 95% CI=0.86-1.85, $P=0.22$).

4. Discussion

The mortality obtained in this study is the first that has been reported from a hospital in Zamfara State; and it was found to be lower than the national average despite our hospital being a new hospital with few infrastructures and staff.

The mortality rate of 20.4% obtained in this study is similar to 20.3% obtained in Benin [5] and 19.3% in Calabar [6]. It is however, higher than 13.3% reported from Abuja [7]. Majority of the newborns that died were males, similar to what was observed in Benin [5]. and the WHO 2006 report [1]. Most of the newborns that died were outborns though not significant, it

is however similar to the finding in Benin[5]. A study in Kano [8] found the risk of dying was higher in outborns compared to inborns.

Most deaths in this study occurred less than 24 hours similar to what has been reported in the Nigerian Demographic and Health Survey 2013 [9], Ibadan [10], Enugu [11] and Sagamu [12]. Ninety five percent of deaths occurred within 7 days, which is similar to what was observed in Calabar [6], Ibadan [10] and Pakistan [13].

Birth asphyxia, prematurity and neonatal sepsis were the commonest cause of death in neonates in Gusau, which is in keeping to what was declared by the Federal Ministry of Health[3] and also reported in Benin [5], Calabar [6], Abuja [7] and other studies[10-14]. Death from neonatal tetanus in this study was low, which is not in conformity to what was observed in Benin [5] and Calabar [6]. Reason may be due to increase vaccination of pregnant women, increase awareness on cord care and avoidance of harmful traditional practices. Death from congenital malformations is also low, this due to the fact that due to the lack of availability of a paediatric surgeons, all congenital malformations amenable to surgery are referred appropriately.

In a developing country like ours, neonatal morbidity and mortality are threats to child survival and poses serious challenges. Unsupervised home deliveries and late referrals contribute to poorer outcome even when the newborn is eventually admitted.

4.1 Conclusion

The mortality rate observed in this study was high, occurred within the first 24 hours of life and attributable to preventable causes. Health education on importance of hospital delivery by trained personnel is advocated. Early presentation to health care facility with sick neonates is highly recommended.

Acknowledgement- None.

Competing interest- None.

Authors' contributions

Garba BI and Muhammad AS conceptualised and designed the study, performed statistical analysis and interpreted the data, drafted the manuscript and critically revised the manuscript and gave approval for final version. Mohammed BA, Obasi AB and Adeniji AO critically revised for important intellectual content, interpreted data and carried out the literature search. All authors read and gave approval for the final version of the manuscript.

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