

RISK FACTORS FOR NEONATAL MORTALITY IN A REGIONAL TERTIARY HOSPITAL IN NIGERIA

C. C. Ezechukwu, E. F. Ugochukwu, I. Egbonu, J. O. Chukwuka

Department of Paediatrics Nnamdi Azikiwe University Teaching Hospital Nnewi

ABSTRACT

Objective: To determine the causes of neonatal mortality in a referral centre in Nigeria with a view to developing strategies that will help in reducing it.

Methods: This is a retrospective patient record review of the records of 166 infants that died in the newborn unit between 1998 when the unit was established and April 2001.

Results: During the study period of 38 months, the mortality was 166 (19.4%) out of a total of 854 admissions. Prematurity, birth asphyxia and sepsis topped the list of causes of death with 30.7%, 24.1%, and 19.3% respectively while postmaturity and intrauterine growth restriction (IUGR) were least with 1.2% each respectively.

Conclusions: To reduce this magnitude of mortality among this group of babies there is need to establish more centres with trained personnel that will offer optimal management for the high-risk pregnancies and strategies to reduce the incidence of prematurity and low birth weight babies must be instituted.

Key words: Neonatal mortality, risk factors, tertiary hospital.

INTRODUCTION

Newborn mortality accounts for nearly two thirds of infant mortality in developing countries¹. Improvement on infant mortality is therefore critically linked to newborn survival. In Nigeria the secondary health facilities often lack the facilities or the personnel or both to cater for sick newborns and premature babies. These sick newborns and premature babies are therefore referred to the tertiary health facilities for care. These facilities are often overstretched in a bid to offer adequate and effective services to the various communities that use them. In order to plan strategies to strengthen their roles it is necessary to study the risk factors that are responsible for mortality in one of such tertiary institutions – Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi. This hospital is the only facility equipped to manage these babies in Anambra State Nigeria. This state has a population of 2.5 million people.

MATERIALS AND METHODS

This is a retrospective study conducted in the neonatal unit of Nnamdi Azikiwe University Teaching Hospital. The neonatal unit consists of three wards with seventeen cots, an infant radiant warmer, five incubators, four

oxygen cylinders, five phototherapy units, one apnea monitor and four resuscitation kits. The unit is divided into three sections for inborn (delivered in NAUTH), out-born (referrals) and an isolation section for severely ill newborns.

For the purposes of this study all the neonatal death records from May 1998 when the unit was established to April 2001 were obtained and analysed. The main thrust of the analysis was the incidence, distribution and primary causes of death. Primary cause of death was defined as a disease or injury which initiated the train of morbid events leading directly to death^{2,3}. The primary causes of death were grouped under the following headings, (i) prematurity (ii) birth asphyxia (iii) sepsis (iv) neonatal jaundice (v) congenital malformations (vi) intrauterine growth restriction (vii) postmaturity. Babies who died due to inability to establish breathing at birth and consequences of hypoxia manifesting as Hypoxic Ischaemic Encephalopathy (HIE) or hypoxic damage to other organ systems were assigned "birth asphyxia" as a cause of death. Babies who died of pneumonia, septicaemia or meningitis were assigned "sepsis" as the primary cause of death.

Prematurity was assigned as the primary cause of death if a preterm baby died of organ system immaturity manifesting as respiratory distress

Correspondence: Dr. C. C. Ezechukwu

(hyaline membrane disease, apneic spells, intraventricular hemorrhage, hypothermia and feeding difficulties⁴. Neonatal jaundice was assigned to those who died as a

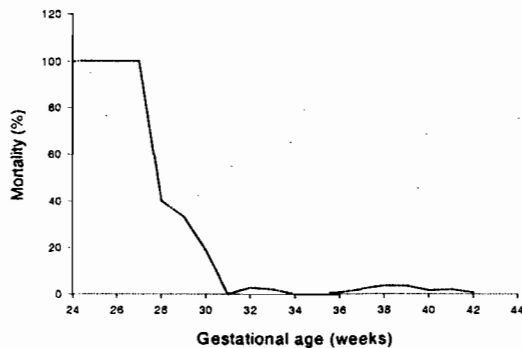


Fig. 1: Neonatal mortality by gestational age.

result of complications arising from ABO incompatibility and Glucose-6-phosphate dehydrogenase deficiency (G6PD-deficiency).

RESULTS

During the 38-month period of this study, 854 babies were admitted into the newborn unit. Out of this number 166 died giving a mortality of 19.4%.

Table 1 shows the primary cause of death in the study population. Prematurity topped the list with 31.9% followed by asphyxia, sepsis and neonatal jaundice with 24.1%, 22.3% and 13.9% respectively.

In figure 1 is presented the mortality rate in relation to gestational age. One hundred percent mortality was observed in babies whose gestational ages were between 24 and 27 weeks. The rate dropped to 40% at 28 weeks and 0% at 31 weeks rose again to 2.7% at 32 weeks and fell to 0% between 34 and 36 weeks.

In terms of birth weight, mortality peaked at 100% in babies who weighed between 500 and 900 grams (Table 2) One hundred and seven or 64.5% of the babies died within 24 hours of admission (Table 3). In Table 4 is presented the mortality patterns in the inborn and outborn babies. The inborn babies had a lower mortality of 36.6%.

Table 1. Primary cause of death

<i>Diagnosis</i>	<i>Number of babies</i>	<i>Percent</i>
Prematurity	53	31.9
Asphyxia	40	24.1
Sepsis	37	22.3
Neonatal jaundice	23	13.9
Congenital malformations	9	5.4
IUGR	2	1.2
Postmaturity	2	1.2
Total	166	100

Table 2. Mortality in relation to birth weight

<i>Birth weight</i>	<i>% mortality</i>
500-990 gram	100.0
1000-1499	27.7
1500-1999	13.6
2000-2499	8.7
2500-2999	2.8
3000-3499	6.3
3500-3999	11.5
4000-4499	3.8

Table 3. Post natal age at death

<i>Age (days)</i>	<i>Number of babies that died (166)</i>	<i>Percent</i>
<1day	107	64.5
1-7	38	22.9
8-14	17	10.2
15-21	2	1.2
22-28	2	1.2
Total	166	100

DISCUSSION

The mortality rate of 19.4% observed in this study is similar to the observation in Calabar.⁵ However when the mortality rate is viewed in terms of gestational age and birth weight, the rate of 100% mortality between the ages of 24 to 26 weeks and 500 to 900 grams, reflects the inability of the existing facilities to cope with the management of babies in these categories and this calls for improvement of services, upgrading of facilities and recruitment of more personnel.

Birth asphyxia was more in bigger babies and contributed significantly to mortality in the first week of life. Similar observation was also made in Port Harcourt.⁶

Neonatal mortality rate was lower in inborns in the tertiary centre than in outborns. This is similar to observations made in other centres^{7,8}. The circumstances surrounding the birth, distance to the tertiary hospital from the referral centres and poor means of transportation (that exposes the infant to hypothermia and infection) may play a role in increasing mortality. Where practicable, in utero transfer of the baby which is cheaper and safer than the hazardous extero-uterine transfer should be adopted.

Prematurity, birth asphyxia and sepsis were prominent causes of neonatal mortality. This is the norm in the developing world^{9,11}, unlike advanced countries where lethal congenital malformations are paramount. Apart from the immature system of the infants which predispose them to sepsis, the parents' inability to procure the required drugs for their infants' treatment could be a factor contributing to mortality from sepsis.

Mortality of 64.5% in the first 24 hours of presentation reflects the state of morbidity of the neonates. In order to reduce this magnitude of mortality among this group of babies there is need to establish more centres with trained personnel that will offer optimal management for the high-risk new born.

REFERENCES

1. **World Health Organization.** The World Health Report 1996. WHO Geneva 1996: 14-15.
2. **World Health Organization:** International Classification of Diseases WHO Geneva 1975: 700.
3. **Singh M, Deorari AK, Paul VK, Murali MV, Mathur M.** Primary cause of neonatal deaths: an autopsy study of 331 cases. *Ann Trop Paed.* 1990; 10:151-57
4. **Kumar M, Paul VK, Kapa SK, Anand K, Deorari AK.** Neonatal outcomes at a sub-district hospital in North India. *J Trop Ped.* 2002; 48: 43-46.
5. **Udoma EJ, Udo JJ, Etuk SJ, Dukes ES.** Morbidity and mortality among infants with normal birth weight in a newborn baby unit. *Nig J Paed.* 2001; 28(1): 13-17.
6. **Oruamabo RS.** Mortality in infants of birth weight 2550gm and above: a hospital based review in Port Harcourt, Nigeria. *West Afr J Med.* 1993;12(1): 34-8.
7. **Oruamabo RS, Ogunremi OA.** Mortality in infants less than 2500 grams birth weight admitted into a special-care baby unit in Port Harcourt, Nigeria. *East Afr Med J.* 1988; 65 (3): 197-202.
8. **Owa JA, Osinaike AI.** Neonatal morbidity and mortality in Nigeria *Indian J Pediatr.* 1998; 65 (3): 4419.
9. **Orett FA, Shurland SM.** Neonatal sepsis and mortality in a regional hospital in Trinidad: aetiology and risk factors. *Ann Trop Paediatr.* 2001; 2(1): 20-5.
10. **Njokanma OF, Olanrewaju DM.** A study of neonatal deaths at the Ogun State University Teaching Hospital, Shagamu, Nigeria *J. Trop Med Hyg* 1995; 98(3):155-60.
11. **Njokanma F Fagbule D.** Outcome of referred neonates weighing less than 2500g. *Trop Geogr Med.* 1994; 46(3): 172-4.