

RISK FACTORS AND CAUSES OF NEONATAL DEATHS IN NAMIBIA

Nelago Indongo

Abstract

Objectives To identify the common causes and risk factors of neonatal deaths in facilities in five regions in Namibia.

Methods This descriptive study was carried out at all health facilities providing maternity care services in the five regions. A total of 498 neonatal deaths recorded in each of the facilities during the period under study January 1, 2010–June 30, 2012 were reviewed. These deaths were evaluated for age, gestational age, birth weight, risk factors and cause of death.

Results About 46.4% of neonates who died had a birth weight less than 1500g and most of them had a gestational age of 26-32 weeks (45.2%). The most common cause of neonatal death was prematurity (n=270 or 54). Respiratory distress syndrome (n=131), birth asphyxia (n=88), sepsis (n=86), and congenital malformations (n=50) were also prevalent causes of neonatal deaths. The third type of delay (delay in receiving care) was perceived to be common (47.8%) for neonatal death cases, reinforcing the fact that two-thirds of neonatal deaths occurred at the hospital where the woman laboured and delivered. The most common reason given for the delay was a lack of facilities (including medications and supplies) to care for premature neonates, lack of trained and available providers. Other causes of the third type of delay noted were delays transferring neonates to higher-level facilities and delays in making the decision to perform a Caesarean section during prolonged labour. Overall, 102 (23.1%) of neonatal deaths for whom maternal HIV status was indicated were born to HIV-positive mothers. Fifty-nine (11.8%) of these mothers were on full HAART during pregnancy; 31 (6.2%) mothers were on ARV prophylaxis and 62 (12.4%) neonates born to HIV-positive women received early ARV prophylaxis.

Conclusion The mortality rate was high in low birth weight neonates. Measures to prevent neonatal mortality must be exercised with emphasis on skilled attendance at birth and appropriate care of low birth weight neonates.

Keywords: Neonatal Deaths, Namibia

Introduction

In developing countries, more than nine million infants die every year before birth and in the first week of life as a result of complications occurring during pregnancy. Many of these deaths are preventable. Rutherford, Mulholland and Hill (2010:508) indicated that 41% of these deaths occur in sub-Saharan Africa. Reducing neonatal mortality is a major thrust of current international public health policy. The neonatal period is defined as less than 28 days of life. It is a highly vulnerable period of life when a neonate may develop certain serious problems which lead to death. Neonatal mortality in United States declined largely due to improvement in obstetric and neonatal intensive care as well as advances in diagnosis and treatment. However, in developing countries neonatal morbidity and mortality is still high and is due primarily to negligence of female health, nutrition, deliveries by un-skilled

personnel and poor antenatal care. Globally the major causes of neonatal death are estimated to be pre maturity, low birth weight, birth asphyxia and severe neonatal infections.

A number of risk factors have been observed to influence adverse pregnancy outcomes including neonatal deaths. Among these are maternal age and utilization of maternal health care services more specifically prenatal and delivery care. In cross sectional retrospective study carried out in Zimbabwe, it was observed that older maternal age was associated with risk of neonatal death (Feresuet al., 2005). These findings corroborate earlier studies that have looked at adverse pregnancy outcomes (Magadi et al., 2001). Other factors that have been indicated in neonatal mortality are prematurity and low birth weight and intrapartum asphyxia. In addition, there was association between neonatal mortality and inadequate or complete lack of antenatal care (Obwaka and Ruminjo, 1995). Place of delivery is an important aspect of reproductive health care. The place of delivery often determines the quality of care received by a mother and infant. It is an important factor in differential risks of neonatal mortality. Children delivered at a health facility are likely to experience lower mortality than children delivered at home because such facilities usually provide a sanitary environment and medically correct birth assistance.

The purpose of this paper is to ascertain some of the potential risk factors associated with neonatal deaths; determine underlying contributory factors to neonatal deaths in health facilities and propose strategies for midwifery practice in order to prevent neonatal deaths. This study hopes to provide information to health care practitioners regarding the contributory factors which may cause neonatal deaths at the hospital. The findings of the study could have major policy and training implications for midwives at the hospital under study, with resulting improvement in the level of maternal and neonatal care. These findings could also lead to improvements in maternal and neonatal care facilities. New knowledge will be brought to the study depending on the results of the research in order to reduce the neonatal deaths caused by preventable causes. The results could also assist the Ministry of Health and Social Services to introduce measures and reinforce existing policies and strategies on obstetric and neonatal care.

Data and methods

Beginning in 2010, all health facilities providing maternity care services were expected to complete a process of peri/neonatal death review within seven days of a death, with the review carried out by the health workers involved and at the institution where the death occurred. Each peri/neonatal death is entered on a confidential peri/neonatal death review form, which is given a unique number and maintained at the institution for review as well as reviewed by a Regional Maternal and Peri/Neonatal Death review committee within one month of the death.

Data collectors reviewed all neonatal deaths recorded in each of the facilities during the period under study (January 1, 2010–June 30, 2012) and collected pertinent data from the confidential peri/neonatal death review form as well as other supporting clinical documentation (e.g., case notes, operating theatre registers, paediatric ward registers). After data collectors completed the clinical audit of neonatal deaths tool, a dataset was created in SPSS. The dataset included information on reported neonatal deaths (deaths to a live-born infant within 28 days of birth) within identified facilities during the study period (January 1, 2010–June 30, 2012); both newborns born at the hospital who died prior to discharge and newborns who were admitted or readmitted and died within 28 days of birth and excluded stillbirths (deaths reported on the peri/neonatal death review form as having occurred prior to birth) as well as neonatal deaths outside of the study period or at home.

Results

A total of 498 neonatal deaths were recorded in the five regions for the study period (January 2010–June 2012). A high number occurred in Khomas region (60.4% or n=301), where most of the births also occurred.

The first antenatal visit is the most crucial visit where baseline data and all relevant history are taken into account and investigations done. A complete assessment of gestational age and risk factors that may threaten the life and wellbeing of the mother and the child may be made at the first antenatal visit. More than 70% (n=352) of mothers of neonates who died received some antenatal care. Of these, only 321 records indicated when the women had started ANC. Two-thirds (67.3%) of those with recorded ANC initiation started ANC in the second trimester. Fewer women initiated ANC in either the first (14.3%) or third (18.4%) trimesters. Among mothers of deceased neonates who had documented ANC visits, the frequency of visits ranged widely from one to more than four visits. It is worth noting that most women (92%) with documented ANC who experienced a neonatal death had had at least two ANC visits.

Almost one-third of neonates (29.7%) who died weighed >2500g at the time of death. All other neonates were low birth weight (<2500g). Twenty-four percent weighed 1500g–2499g, and another 23.7% weighed 1000–1499g. Twenty-one percent of neonates weighed less than 1000g. The weight data for neonates who died are consistent with the gestational age data, indicating a significant burden of prematurity. Of neonates who died, 27% died on the day of birth and an additional 22% died within the first 24 hours of life, making up almost 50% of all of the deaths. The incidence of neonatal deaths declined on all subsequent days in the study up to one week.

Of the 441 neonatal deaths where information was available, the maternal HIV/AIDS status was unknown for 79 (17.9%) of the cases. Overall, 102 (23.1%) of neonatal deaths for whom maternal HIV status was indicated were born to HIV-positive mothers. Fifty-nine (11.8%) of these mothers were on full HAART during pregnancy; 31 (6.2%) mothers were on ARV prophylaxis and 62 (12.4%) neonates born to HIV-positive women received early ARV prophylaxis. Twelve women who were HIV-positive were not recorded as receiving any antiretroviral medication.

For 319 neonatal deaths (or 64% of those studied), it was reported that the death occurred at the facility where labour and birth occurred. Most (58.6%) newborns who died were delivered by normal vaginal delivery, and more than one-fourth (116 or 23.3%) were delivered by Caesarean section. About 95% of all neonates who died were delivered at health facility. There were only a few who were delivered at home or enroute to the health facility.

Table 1: Distribution of facility audited neonatal deaths by background characteristics

Characteristic	Number of deaths	%
Region		
Erongo	76	15.3
Hardap	38	7.6
Karas	59	11.8
Khomas	301	60.4
Omaheke	24	4.8
Type of facility		
Health Centre	2	0.4
District hospital	195	39.2
Intermediate hospital	89	17.9
Central hospital	212	42.6
Mother attended ANC		
Yes	352	70.7
No	77	15.5
Unknown	69	13.9
Birthweight		

Less than 2500g	329	70.3
2500g and more	139	29.7
HIV status of mother		
HIV positive	102	23.1
HIV Negative	260	59.0
Unknown status	79	17.9
Place of delivery		
Health facility	466	93.6
Home or enroute to facility	22	4.4
Unknown	10	2.0
Method of delivery		
Normal vaginal	292	58.6
Assisted vaginal with vacuum	4	0.8
C-section	116	23.3
Breech delivery	4	0.8
Unknown	82	16.5

Causes of death among neonates

The most common cause of neonatal death was prematurity (n=270 or 54.2%), which is reflected in birth weight and gestational age tables as well. Respiratory distress syndrome (n=131), birth asphyxia (n=88), sepsis (n=86), and congenital malformations (n=50) were also prevalent causes of neonatal deaths. Respiratory distress syndrome is most often the result of prematurity; birth asphyxia and hypoxic ischemic encephalopathy (n=34) are both related to intrapartum and immediate neonatal events (e.g., prolonged or obstructed labour, lack of immediate neonatal resuscitation when indicated). Other less common causes of neonatal death were noted to be necrotizing enterocolitis, hypothermia, jaundice, surgical complications, birth trauma, and tetanus.

Matthews and MacDorman, 2010 analysed the 2006 infant mortality statistics from the nationally linked birth/infant death data set and found that infant mortality rates were highest for very preterm (less than 32 weeks) infants, and the risk decreased sharply with increasing gestational age. In addition, in their study Kaushik et al 1998 examined the relationship of neonatal mortality rate to birth weight and gestational age and found that infant mortality rates were much higher for low birth weight (less than 2,500 grams) infants (55.38 per 1,000) than for infants with birth weights of 2,500 grams or more. Bloland et al. 1995 conducted a retrospective analysis of data from a cohort of mothers and infants in rural Malawi conducted from 1987 to 1990 and the study concluded that infant mortality rates were significantly higher among children born to HIV sero-positive women compared to those born to HIV sero-negative women.

For Namibia, the pattern is similar to what is reported in other African countries. HIV status of the mother, birth weight of a baby and gestational age are the main risk factors associated with neonatal deaths. The majority of babies born to HIV positive mothers died due to prematurity, sepsis and respiratory distress syndrome and birth asphyxia in that order (Table 2). It is not surprising to note that 98% of neonate who died due to prematurity weighted less than 2500g at birth. However, a significant high proportion of underweight babies died as a result of necrotising enterocolitis (83.3%); birth asphyxia (74.7%) and respiratory distress syndrome (71.5%). The majority of neonates born weighting 2500g or more died due to encephalopathy (94.4%); hypoxic ischemic (85.7%) and sepsis (54.9%).

Table 2: Distribution of neonate deaths by cause and HIV status of mother and birth weight

Cause of death	Mother HIV Positive		Less than 2500g		2500g or more	
	Number	%	Number	%	Number	%
Prematurity	54	52.9	251	98.0	5	2.0
Birth Asphyxia	19	18.6	59	74.7	20	25.3
Sepsis	24	23.5	37	45.1	45	54.9
Respiratory Distress Syndrome	22	21.6	88	71.5	35	28.5
Hypoxic Ischemic	3	2.9	2	14.3	12	85.7
Encephalopathy	-		1	5.6	17	94.4
Necrotising enterocolitis	3	2.9	15	83.3	3	16.7

Delays as contributors to neonatal deaths

The results from this section support contributions from all three types of delay to neonatal death, according to the health workers interviewed: delays in seeking, reaching, and obtaining care. The third type of delay (delay in receiving care) was perceived to be common (47.8%) for neonatal death cases, reinforcing the fact that two-thirds of neonatal deaths occurred at the hospital where the woman laboured and delivered. Only 0.5% of mothers of neonates who died experienced the second type of delay (delay in reaching a facility due to transport or financial barriers). For the 96 mothers of neonates who experienced the third type of delay the most common reason given for the delay was a lack of facilities (including medications and supplies) to care for premature neonates, lack of trained and available providers. Other causes of the third type of delay noted were delays transferring neonates to higher-level facilities and delays in making the decision to perform a Caesarean section during prolonged labour. A number of neonates also were reported to have experienced a combination of the first and third delays (n=22; 10.9%).

Discussion

Approximately two-thirds of neonatal deaths occurred at the facility in which the neonate was born and, as indicated by both birth weight and gestational age data, prematurity was the cause of more than half of neonatal deaths. Other important causes were birth asphyxia, sepsis, and respiratory distress syndrome. Neonatal death audit responses indicate that few facilities are equipped to care for premature neonates. Moreover, transfer of premature neonates was delayed in a number of facilities during the time period of this study.

Velaphi and Rhoda (2012) recommended that access to CEmOC by bringing facilities closer to communities results in reduction of neonatal deaths. Maternity waiting homes should be provided for those women who stay far from facilities that conduct births and do not have transport. Most births in Namibia occur in district hospitals, many of which are located in rural areas where transport to the hospital is not easily available, so waiting maternity homes would be well suited for these areas and would play a major role in reducing intrapartum hypoxia-related deaths.

Training in neonatal resuscitation is another aspect reported to reduce deaths in babies with intrapartum asphyxia and early neonatal deaths. The need for assistance or resuscitation at birth is not always predictable, so all nurses and doctors involved in obstetric and neonatal care should be trained in at least immediate care of the newborn and basic neonatal resuscitation. Training on its own will not be adequate without provision of the equipment required for resuscitation, so all labour wards, delivery rooms and neonatal/paediatric wards should be provided with appropriate equipment to resuscitate newborns with intrapartum asphyxia. Provision of resuscitation equipment must be accompanied by plans to replace equipment or parts of the equipment that are found not to be in working condition or are lost.

There is therefore an urgent need to get equipment to all healthcare facilities. In order to reduce neonatal deaths, more emphasis must be placed on preventing preterm birth and intrapartum asphyxia, and managing them when they do occur.

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