

# ***Morbidity and Mortality among Infants with Normal Birthweight in a Newborn Baby Unit***

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## **Summary**

**Udoma EJ, Udo JJ, Etuk SJ, Duke ES. Morbidity and Mortality among Infants with Normal Birthweight in a New Born Baby Unit. *Nigerian Journal of Paediatrics* 2001; 28:13.** A prospective study of all newborn infants with normal birthweight admitted to the newborn unit , University of Calabar Teaching Hospital, Calabar from April 1996 to March 1998, was carried out. The aims were to determine the causes of morbidity and mortality among these neonates as well as relate these to the place of delivery. Of the 286 babies admitted to the unit during this period, the major causes of morbidity were septicaemia in 35.9 percent, neonatal jaundice in 19 percent, tetanus in 13 percent and birth asphyxia in 10.9 percent. There were 52 deaths, an overall mortality of 18 percent. Neonatal tetanus was the leading cause of death in this series accounting for 42.3 percent of the deaths and a case fatality rate of 59.5 percent. Other causes were birth asphyxia, septicaemia, neonatal jaundice and congenital malformations. Most of the morbidity and mortality were in babies delivered in religious buildings and the homes of traditional birth attendants (TBAs). Health education and other strategies aimed at changing the attitude of our TBAs and spiritualists towards utilization of sterile procedures, immunization services and prompt referral of complicated obstetric cases to where modern health care facilities exist, are recommended.

## **Introduction**

IN technologically developed nations, neonatal morbidity and mortality are largely due to congenital malformations,<sup>1-3</sup> but in the less developed world, preventable diseases such as neonatal tetanus, septicaemia and birth asphyxia are prominent causes of deaths among neonates.<sup>4-6</sup> Lack of antenatal care and delivery in suboptimal conditions under the care of untrained attendants contribute to these deaths.<sup>4</sup>

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In Nigeria and many other countries, studies on neonatal morbidity and mortality concern mostly low birthweight and normal birthweight infants, while studies on normal birthweight infants requiring intensive care and the various perinatal factors affecting their survival are few.<sup>7,8</sup> The present prospective study was therefore undertaken to determine the causes of morbidity and mortality of only normal birthweight infants who were admitted into the newborn unit of the University of Calabar Teaching Hospital (UCTH), Calabar. It also aimed at assessing the influence of the place of delivery on morbidity and mortality among these neonates. It is hoped that the findings of this study will form the basis for formulating preventive measures.

## **Patients and Methods**

This present study concerned all normal birthweight infants admitted into the neonatal unit of UCTH from April 1996 to March 1998. The new-

born unit of the hospital is divided into two sections consisting of a Special Care Baby Unit (SCBU) that is reserved for infants born in UCTH and the Sick Baby Unit (SBU) reserved for babies referred from other hospitals and clinics, churches and homes of traditional birth attendants. For the purpose of the study, normal birthweight is defined as that between 2500gms and 4000gms. Modern health care facilities refer to UCTH, maternity homes, health centres and other hospitals.

Data recorded for each neonate included birthweight, sex, gestational age, indication for admission, morbidity and causes of death. Mode and place of delivery and maternal complications were also noted. Definitive diagnoses of fatal cases were made after each had been exhaustively discussed at the departmental case review meetings as well as a review of the laboratory results and, where available, autopsy findings. Data were evaluated, using simple proportions, rates and tables.

### Results

During the period of study, there were 1328 deliveries of infants with normal birthweight in

UCTH. There were 736 admissions to the neonatal unit of UCTH during the same period. Out of these, 286 (38.9 percent) were of normal birthweight, the male to female ratio was 1.4:1. Birthweight ranged from 2500gms to 4000gms (mean of 3200gms). The mean gestational age was 40.7 weeks and 274 (96 percent) of the infants were older than 37 weeks, while 12 (4 percent) were less than 37 weeks. Deliveries in modern health care facilities were 218 (76 percent), while 43 (15 percent) and 25 (9 percent) were delivered in churches and traditional birth attendants' homes, respectively. Mean one-minute Apgar score for patients delivered in orthodox health care facilities was 6.6 and the mean of five-minute Apgar score was 8.2. Apgar scores from babies delivered elsewhere were unknown.

Two hundred and fourteen (74.8 percent) of the neonates were born by spontaneous vaginal delivery, 62 (21.7 percent) by Caesarean section, 9 (3.2 percent) by low forceps and 1 (0.3 percent) by vacuum extraction. Major indications for admission as shown in Table I, were septicaemia in 102 (35.7 percent): 92 (90 percent) from hospitals with the majority of mother being unbooked cases who only presented to hospital after prolonged labour with chorioamnionitis

Table I

*Morbid Conditions and Place of Delivery of 286 Normal Birthweight Infants Admitted into the Newborn Unit, UCTH*

Diagnosis	UCTH	OHC and Others	Non-Hospital TBAs and Churches	No of Cases	Percent of Total
Septicaemia	60	32	10	102	35.7
Neonatal jaundice	26	20	8	54	18.9
Neonatal tetanus	0	0	37	37	13.0
Birth asphyxia	10	11	10	31	10.8
Congenital malaria	8	5	0	13	4.5
Congenital malformations	7	5	0	12	4.2
Bronchopneumonia	6	4	0	10	3.5
Aspiration pneumonia	2	4	1	7	2.5
Conjunctivitis	2	2	0	4	1.4
Hypoglycaemia	1	3	0	4	1.4
Meconium aspiration	2	1	0	3	1.0
Transient tachypnoea of newborn	2	0	0	2	0.7
Birth injury	0	2	0	2	0.7
Others	0	3	2	5	1.7
<b>Total</b>	<b>126</b>	<b>92</b>	<b>68</b>	<b>286</b>	<b>100.0</b>

OHC = Orthodox health centre

and 10 (10 percent) were from non-hospitals; neonatal jaundice in 54 (18.9 percent): 46 (85 percent) from hospitals and 8 (15 percent) from non-hospitals; and neonatal tetanus in 37 (13 percent) all of whom were from non-hospitals. Birth asphyxia accounted for 31 (10.8 percent) cases: 21 (68 percent) from hospitals and 10 (32 percent) from non-hospitals. Thirteen (4.5 percent) of the admissions were for congenital malaria while 12 (4.2 percent) were admitted with congenital malformations and all of them were babies delivered in hospitals. Others were empyema thoracis, haemorrhagic disease of the newborn, meningitis, necrotizing enterocolitis and scalded staphylococcal skin syndrome contributing one (0.3 percent) each and of these, 3 (60 percent) were from hospital deliveries, while 2 (40 percent) were from non-hospital deliveries.

There were 52 deaths, an overall mortality of 18 percent among these normal birthweight infants (Table II). Neonatal tetanus was the leading cause of mortality contributing 22 (42.3 percent) of the deaths and 16 (73 percent) of those who died from this cause were delivered in churches, while six (27 percent) were delivered in TBAs' homes. Severe birth asphyxia was the cause of death in 32.7 percent. The contributing factors in this group were prolonged obstructed labour, eclampsia and antepartum haemorrhage. Septicaemia accounted for seven (13.4 percent) deaths. The diagnosis of septicaemia was made both on clinical grounds and positive blood cultures in all the cases. Five (71.4 percent) of these cases were delivered outside the hospital. For two deaths that occurred in the hospitals, their mothers had prolonged obstructed

labour at the TBAs' homes and were later referred to UCTH. Deaths from neonatal jaundice and congenital abnormalities were 3 (5.8 percent) each. Two deaths following neonatal jaundice complicated by kernicterus came from spiritual churches. Mortality from congenital malformations was due to cyanotic heart disease, meningomyelocele and gastrointestinal obstruction, which were not amenable to surgery.

### Discussion

The present study has revealed that infections, neonatal jaundice and birth asphyxia were the commonest indications for admission of normal birthweight infants into the newborn unit in Calabar. The mortality of 18 percent among these normal birthweight infants in this study is comparatively higher than those reported by other workers in developed countries.<sup>78</sup> A significant proportion of neonatal deaths in these normal birthweight infants are potentially preventable. Neonatal tetanus contributed 42.3 percent of overall mortality. The high prevalence of this fatal condition in our community is due to the traditional methods of severing the umbilical cord with unhygienic instruments and dressing it with contaminated herbal mixtures and other lethal substances.

<sup>4</sup> Superstitious beliefs and fear that tetanus toxoid can cause female infertility also interfere with acceptance of tetanus toxoid immunization in our community.<sup>4</sup> It is therefore not surprising that all the cases of neonatal tetanus came from either TBAs' or churches.

Death from severe birth asphyxia occurred in

Table II

*Causes of Death in and Places of Delivery of Normal Birthweight Infants Admitted into Newborn Unit, UCTH*

Cause of Death	Place of Delivery						*CFR (Percent)	
	Male	Female	Spiritual Churches	TBA	UCTH	Others		
Neonatal tetanus	13	9	16	6	0	0	22(42.3)	59.5
Severe birth asphyxia	12	5	8	1	3	5	17(32.7)	54.8
Septicaemia	4	3	4	1	2	0	7(13.4)	6.9
Neonatal jaundice	1	2	2	0	0	1	3(5.8)	5.6
Congenital malformations	2	1	0	0	1	2	3(5.8)	25.0
Total	32	20	30	8	6	8	52(100)	

Figures in parentheses represent percentages

\*CFR = Case fatality rate

32.7 percent of the cases and majority of these were from mothers who had no antenatal care. It was difficult to rule out intracranial haemorrhage as the cause of death among this category of babies due to lack of facilities for brain scan and the fact that most patients' relatives generally did not accede to request for the post mortem examination. Moreover, lack of facilities for artificial ventilation has made it difficult to improve the chances of potentially salvageable neonates. The highest distribution of deaths from birth asphyxia was seen among cases delivered in hospital. This is paradoxical. It should be noted that most of the infants who died from this cause following hospital delivery, were those whose mothers had prolonged labour and came to hospital as a last resort when the effort and skills of the traditional birth attendants and spiritualists had been exhausted.

Septicaemia was responsible for deaths in seven of the cases, and of these, five had their delivery with TBAs or churches. Inadequate antenatal care and unhygienic delivery practices are possible explanations. Similar observations of a higher frequency of septicaemia among outborn neonates have been made by other workers.<sup>4,5,9</sup>

Majority of deaths from neonatal jaundice also came from churches with late referral to UCTH after kernicterus had set in. Earlier studies on neonatal jaundice in University College Hospital (UCH), Ibadan, indicated that neonatal jaundice was more severe and associated with higher incidence of kernicterus and deaths in babies born outside the hospital.<sup>10,11</sup> Jaundice was also found to be more often associated with septicaemia in the outborn neonates than in the inborn babies.<sup>10,11</sup> The difference in severity and prognosis of neonatal jaundice between the former and the latter was attributed to numerous precipitating factors existing in the baby born at home as well as the delay in parents seeking medical attention.<sup>11</sup> Severe congenital malformations seen in this study were not amenable to treatment. Congenital malformations however do not constitute a major cause of perinatal mortality in Nigeria,<sup>2</sup> in contrast to what obtains in developed countries.<sup>12-14</sup> It is obvious that when neonatal infection and birth asphyxia have been successfully contained in the future, congenital malformations may then rank high as a cause of death in our neonates.

The present study has shown that preventable conditions continue to be the main cause of morbidity and mortality in newborn infants with normal birthweight in Calabar. Despite the ongoing expanded programme on immunization, neonatal tetanus still claims the lives of newborn infants. This may be due to the fact that health education is yet to create ad-

equate impact on the society. Traditional birth attendants and churches that engage in obstetric practices may not be paying adequate attention to aseptic procedures and utilization of tetanus toxoid vaccines. Therefore, efforts should be focused on health education and other preventable strategies that aim at changing the attitude of our society, the traditional birth attendants and spiritualists towards utilization of immunization services. Prompt referral of complicated obstetric cases to where facilities exist, should be emphasised. Religious organizations should be recognized as important targets in efforts to reduce neonatal mortality in our environment, and the need for them to establish properly staffed and well equipped health clinics to provide emergency obstetric care, as an annex to the church should be emphasised.

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