

MORBIDITY AND MORTALITY PATTERNS OF ADMISSIONS INTO THE SPECIAL CARE BABY UNIT OF UNIVERSITY OF ABUJA TEACHING HOSPITAL, GWAGWALADA, NIGERIA

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ABSTRACT

Objective: To determine the morbidity and mortality patterns of patients admitted into the Special Care Baby Unit (SCBU) of the University of Abuja Teaching Hospital (UATH), Gwagwalada, Nigeria.

Method: A retrospective analysis of records of patients admitted into the SCBU of the UATH over an 18 month period of January 2005 to June 2006 was carried out.

Result: A total of 654 patients were admitted into SCBU of UATH during the review period, there were 351 (53.7%) males, and 303 (46.3%) females given a male to female ratio of 1.2:1. The four leading causes of admissions were low birth weight (LBW) 32.7%, neonatal sepsis (NNS) 19.1%, severe birth asphyxia (SBA) 12.7%, and neonatal jaundice (NNJ) 8.7%. Eighty one (37.9%) of the LBW were term and small for gestational (SGA), while 133 (62.1%) were preterm. Of the 87 (13.3%) deaths recorded during the review period, SBA (21.7%), LBW (20.1%), neonatal meningitis (15.4%), and NNS (11.2%) were the four leading causes of preventable deaths, while congenital abnormalities (20.0%) was the commonest cause of non-preventable conditions. 71.2% of all deaths occurred within the first 72 hours of admission, while 57.7% of such deaths were babies of mothers from low socio-economic background.

Conclusion: Patterns of admissions and mortality into SCBU of UATH were comparable to studies elsewhere, and points to preventable conditions as the leading causes of such admissions and deaths. Efforts to reduce LBW, SBA, NNS and NNJ through enhancement of good antenatal and delivery services, as well as improvement in the facilities in the unit will assist in death reduction. Health education and economic empowerment especially of women will be an added advantage.

Key Words: Pattern, morbidity, mortality, Special Care Baby Unit, admissions. (*Accepted 30 October 2008*)

INTRODUCTION

Evidence from relevant literature has shown enormous global progress in the care of newborns during the past 2-3 decades especially in the resource rich settings.^{1,2} This progress is reflected in the considerable improvement in the survival rate of newborn babies and a better prognosis among survivals in the technically advanced nations.^{1,2} The reverse is the case in most developing countries where neonatal morbidity such as NNS, LBW, SBA, NNJ, prematurity still remain a major medical problem.³⁻⁷ The survival of very preterm in such environments is a major concern for paediatricians caring for the newborns. The neonatal period (0 to 28 days of life) has been the most critical period of life because of the various problems associated with it.⁷ A large majority of newborns may not experience serious problems/difficulties and may require only minimal care by their mothers with little supervision of health workers. Some may however be high risk

newborns, and usually products of high risk pregnancies who are prone to various problems ranging from prematurity, small for gestational age (SGA), LBW, SBA, NNS, NNJ, to congenital malformations.⁸ Newborns delivered in such circumstances, have been found to account for over half of perinatal and neonatal morbidity and mortality.^{8,9} The prognosis of these neonates depends to a large extent on both the severity of the disease as well as the management protocol utilised.

The Special Care Baby Unit is a key service area in the tertiary health institutions in the country. It is a area where newborns are promptly managed on 24 hour basis. The unit represents a high volume, high stress service area of the hospital. The concept of performance evaluation in the hospital is an indispensable tool for evaluating the health care service rendered to the populace. It is also meant to generate base line data for policy formulation for health care operatives, as well as auditing its level of care to the people. Since the inception of the hospital in 1983 and subsequent establishment of SCBU, there has been no comprehensive review of performance

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activities in this very important key service area of the hospital except for the weekly mortality review meetings. The aim of this study is therefore to document the morbidity and mortality patterns of admissions into SCBU of UATH. It is also aimed at providing baseline data for the hospital, and useful information for other institution.

MATERIALS AND METHODS

A retrospective review of the admissions of all newborns admitted into the SCBU of UATH between January 2005 to June 2006 was undertaken. The case records of both in-born and out-born babies were retrieved from the Medical Records Department of the Hospital, and relevant data extracted and analyzed. The information extracted included the age, sex, weight on admission, number of days, reason(s) for the admission, diagnosis made, outcome of admission, parent socio-economic characteristics, and time of death. Care of newborns in the SCBU at UATH is not intensive and involves keeping babies warm in incubators, use of radiant warmers, phototherapy units, naso-gastric tube feeding for very sick newborns, extremely or very low birth weight babies. Use of mother's milk is mandatory except when medically not feasible. Admission care included prevention and treatment of infections, hypoglycaemia and hyperbilirubinaemia. Oxygen was administered when required in the incubator, through face or nasal catheter. Birth weight was taken with beam weighing scale, length measurement was carried out using infantometer, and head circumference was measured using a measuring tape.

Hyperalimentation and mechanical ventilators were not used in the management of newborns in this study. The Dubowitz¹⁰ was used in the assessment of gestational age. Babies weighing 2500grams or less were considered as having LBW, those weighing 1500grams or less, and 750grams or less were categorised as very low or extremely LBW respectively^{11,12}. Large for gestational age (LGA) were babies weighing 3.9kg and above.^{11,12} Pre-term deliveries were those babies delivered before 37 weeks of gestation, while post-terms were those delivered after 42 weeks.^{11,12} Olusanya's¹³ two-factor index (husband's occupation and maternal level of education) was used to group the subjects according to their socio-economic background. Accordingly, scores of 3,2,1 were assigned to husband's occupation: 3 points for unskilled workers, 2 points for middle level bureaucrats, technicians, skilled artisans, and well to do traders, and 1 point score for professionals, top civil servants, politicians and businessmen. For maternal level of education: zero point was assigned to university education, 1 point for those who completed secondary or post

Secondary schools and two point score for those who had only primary education or received no education at all. The scores were summed up and the total score was used to determine socio-economic status (SES) as follows: 1 and 11 (upper SES), 111 (middle SES), and 1V and V (low SES). UATH is a referral hospital providing services to people in Federal Capital Territory (FCT) and adjoining states including Kogi, Nasarawa, Niger and some parts of Kaduna state. It is a 350 bed hospital and was upgraded to the level of a teaching hospital in April 2006. Data analysis was computed using SPSS program version 7.5 of 1996. The analysis provided frequency distributions, histograms, measurement of dispersions, and p-value for inferences.

RESULTS

During the 18 months under review, a total of 673 patients were admitted into SCBU of UATH. As nineteen babies with incomplete data were excluded from the analysis, the study was based on 654 subjects of whom 351(53.7%) were males and 303 were (46.3%) female with a male to female ratio of 1.2:1. Two hundred and seventy one babies (41.4%) were out-born with referrals outside UATH, while 383 (58.7%) were in-born deliveries. 486 (74.3%) babies were delivered vaginally, 165 (25.2%) were by caesarean section (C/S), and 3 (0.5%) were by forceps delivery, (Table 1). The distribution of patients by sex and body weight in Table II shows that 214 babies (32.7%) of babies admitted were LBW ie birth weight = 2.5kg. Eighty one (37.9%) of the LBW babies were term, while 133 (62.1%) were preterm. Four hundred and five (61.9%) of the babies were term and adequate for gestational age, 35 (5.4%) were large for age. Table 3 depicts the reasons for admission into SCBU. Apart from LBW which constituted the greatest reason for admission into the unit (32.7%), NNS (19.1%), SBA (12.7%), NNJ (8.9%), were other major reasons for admission into the unit. Babies admitted for observation (9.7%) were some babies deliveries by emergency C/S, forceps deliveries, and babies of mothers with poor medical conditions, as well as exposed newborns who needed to stay for few hours in the SCBU for commencement of antiretroviral drugs neonatal post exposure prophylaxis. Among uncommon conditions for admission were meningitis (2.0%), haemorrhagic disease of the newborn (2.1%), and congenital abnormality (2.3%). Patients mortality based on the reasons for admission into SCBU was shown in Table IV. Congenital abnormalities (20.0%), neonatal meningitis (15.4%), and respiratory distress syndrome (RDS) (10.5%), though not included in the main reasons for admission into the unit, however contributed to the higher number of deaths among admitted patients in SCBU. SBA (21.7%), LBW

(20.1%) NNS (11.2%) and kernicterus (10.0%) were the four leading causes of preventable deaths in the unit. The over all mortality in this study was 87 (13.3%). Analysis of mortality based on the body weight, socio-economic class (SEC), and time of death was shown in Tables 5, 6 & 7. It was observed that mortality per body weight per total number of deaths was high among babies weighing = 2500gms, 63/87 (72.4.0%), with 75% occurring in extreme pre-term babies, and 64.3% among the very LBW babies. 19/87 (21.8%) of deaths occurred in term and AGA babies, while 5/87 (5.8%) were among the LGA babies, (Table 5). When number of deaths was also considered on SEC of the parent, it was observed that 57.7% of such deaths were in babies from low socio-economic background, 39.0% from the middle class, and 3.3% from those in the upper class, (Table 6). It was also noted that 71.2% of deaths occurred in the first 72 hours of admission, with 42.5% of such deaths occurring in babies admitted less than 24 hours. Least number of deaths were among those newborns who has stayed longer than 14 days (3.5%). Fig 1 illustrates the outcome of admission into the unit. While 528 (78.5%) of admissions were discharged home in good health, 87 (13.3%) died, 5.3% left against medical advice (LAMA), and 18(2.7%) referred to other hospitals.

Table 1: Characteristics of Patients Admitted into Special Care Baby Unit.

Variables	Sex of Infants		Total
	Male	Female	
No of patients	351	303	654
Birthweight (kg)	*3.1±0.6	*2.7±0.2	*2.9±0.5
Gestational age (wks)	*40.0±2.7	*36.4±3.2	*38.2±2.9
SVD	259	227	486
C/S delivery	90	75	165
Forcep delivery	2	1	3
Inborn	209	174	383
Out born	144	127	271
Age (days)	2.9±1.2	3.7±0.9	3.3±1.1

* Values are mean ± SD

SVD Spontaneous vertex delivery

C/S Caesarian section

Table 2: Distribution of Birthweights by Sex of Babies in Special Care Baby Units.

Birth weight (Kg)	Male	Female	Total	Percentage of Total (%)
<0.75	1	3	4	0.6
0.75-1.49	24	18	42	6.4
1.50-2.49	91	77	168	25.7
2.50-3.99	215	190	405	61.9
>4.0	20	15	35	5.4
Total	351	303	654	100

Table 3: Reasons for Admission into Special Care Baby Unit.

Reasons for Admission	No of Babies	Percentage (%)
Low birth weight	214	32.7
Neonatal sepsis	125	19.1
Severe Birth asphyxia	83	12.7
Neonatal Jaundice	58	8.9
Observation	65	9.9
Kernicterus	20	3.2
RDS	19	2.9
Congenital malformation	15	2.3
HIV/AIDS	14	2.1
HDN	14	2.1
Meningitis	13	2.0
Others	14	2.1
Total	654	100

HIV/AIDS - Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome.

HDN -Haemorrhagic Disease of the Newborn

RDS -Respiratory Distress Syndrome

Table 4: Mortality Based on Reasons for Admission.

Reasons for admission	No. of Babies	No. of deaths	% Mortality
LBW	214	43	20.1
Severe birth Asphyxia	83	18	21.7
Congenital abnormality	15	3	20.0
Meningitis	11	2	15.4
Neonatal sepsis	125	14	11.2
RDS	19	2	10.5
Kernicterus	20	2	10.0
Jaundice	58	3	5.2

LBW - Low Birthweight

RDS - Respiratory Distress Syndrome

Table 5: Mortality Based on Body Weight.

Body Weight (kg)	Total No of Babies	No. of Deaths	%age mortality
>7.5	4	3	75.0
0.75-1.49	42	27	64.3
1.50-2.49	168	33	19.6
2.50-3.99	405	19	4.7
>4.0	35	5	14.2
Total	654	87	13.3

Table 6: Mortality Based on Socio- economic Status of Parents.

Socio-economic Status	No of Patient	No of Deaths	% mortality per SES	% mortality by total death
Upper SES	70	3	4.2	3.4
Middle "	298	34	11.4	39.1
Low "	286	50	17.5	57.5
Total	654	87	33.1	100

SES Socio economic Status

Table 7: Time of Death of 87 Babies Admitted into SCBU.

Time of death (days)	No of deaths	% of total
< 1.0	37	42.5
1.0- < 3.0	25	28.7
3.0- < 7.0	13	14.9
7.0 - < 14.0	9	10.4
14.0 - 28.0	3	3.5
Total	87	100

SCBU - Special Care Baby Unit

DISCUSSION

The main reasons for the admission of babies into SCBU of UATH were preventable conditions such as LBW, SBA, NNS and NNJ, these compared favourably with findings from other developing countries.^{3-9, 14-20,22-24} The LBW admission of 32.7% observed in this study though comparable to 36.2% report from Owerri,¹⁸ is much higher than 14%, 19% and 21.2% from Benin,¹⁶ Nnewi²² and India.²³ It was however much lower than 42.9% from Zaria,¹⁹ and 41.2% from Peshawar Pakistan.⁷ The differences in LBW admissions from different settings might be due to high rate of preterm deliveries in centres with high figures or partly due to differences in indications for admission into SCBU from different centres. Lack of nutritional education, late antenatal care services, as well as maternal short stature were the main factors responsible for LBW deliveries in Ethiopia,²⁹ while illiteracy and malnutrition were the major reasons in Pakistan.^{7,30}

Combination of these factors may also be responsible for high number of LBW deliveries observed in the present study. Respiratory distress syndrome (RDS) when diagnosed histologically is more reliable than when diagnosed clinically because of the wide variation in the clinical picture of this disease.²⁵⁻²⁷ Clinically diagnosed RDS was reported in 2.9% of patients seen in the present study, and contrasted significantly with reports from Ibadan, (9.0%)⁶ as well as reports from Enugu.²⁵ The low incidence of RDS in the present report, and in other series of reports even among black newborns in the US raises questions as to whether there is racial differences in the incidence of RDS. This may be because while most reports from black dominated countries were reporting lower incidence,^{15,25,26} reports from Singapore and US showed higher figures of 47.0%²⁸ and 20.0%²⁷ respectively. Neonatal infection is one of the leading causes of morbidity and mortality in SCBU in most developing countries^{22-24,28-30}

In the present study, NNS was seen in 19.1% of cases. This was much lower than 42.5% from Karachi,²⁹ 33.5% from Benin,¹⁶ but however higher than 10.2% from Zaria,¹⁹ and 8.7% from Umuhia.³¹ Home deliveries, poor obstetric care, and un-sterile

delivery practices could be responsible for high morbidity from sepsis in most developing countries. The mortality rate of 13.3% recorded in the present study was closer to 14.8% and 14.9% from Zaria,¹⁹ and Pakistan,⁷ lower than 17.6% from Owerri,¹⁸ 21.0% from Ibadan,⁶ but higher than 11.9% and 11.5% from Port-Harcourt⁵ and Benin.¹⁶

The differences might be related to LBW admissions which in most centres constitute a significant denominator of neonatal mortality. With the exception of SBA and congenital malformation, neonatal mortality rates were invariably higher among the LBW infants in all the neonatal problems considered. It became obvious that any reduction in the overall neonatal mortality will aim at instituting measures that will reduce the incidence of LBW deliveries.

Neonatal meningitis, congenital abnormalities, RDS, and kernicterus though not common reasons for admission into SCBU, however contributed significantly to mortality in the unit. High mortality from congenital malformations have also been reported even in advanced countries and in some developing countries.^{1,2,18,23} These conditions requires not only special and early intervention, but also special life saving equipments which are out of reach in most developing countries. The highest mortality from SBA (21.7%) have also been reported in other centres,^{7,19} and points to the fact that special attention is required of high risk pregnancies during antenatal visits and during deliveries, as well as timely referral and active resuscitation at birth.

Most deaths that occurred in this study was during the first 72 hours of admission (71.2%), with greater than 40% occurring in the first 24 hours. Such early deaths in SCBU have also been reported by several other workers in the developing countries,^{4,6,15} and all points toward revisiting circumstances during labour and delivery, timely referral, and timely seeking of medical assistance by parents.

Most deaths that also occurred was among the low income people (57.7%) and middle socio-economic class (39.0%). High mortality rate among newborns from low socio-economic background was not surprising since this group of infants were those whose mothers will less likely have antenatal care services during pregnancy, more likely to deliver under the supervision of unskilled hands, and less likely to seek medical assistance.

CONCLUSION

Patterns of admissions and mortality into SCBU of UATH were comparable to studies elsewhere, and points to preventable conditions as the leading causes of such admissions and deaths. Efforts of reduce LBW, SBA, NNS and NNJ through enhancement of

good antenatal and delivery services, as well as improvement in the facilities in the unit will assist in death reduction. Health education and economic empowerment especially of women will be an added advantage.

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