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Pattern of Diseases and Care Outcomes of Neonates Admitted in Special Care Baby Unit of University College Hospital, Ibadan, Nigeria From 2007 To 2011.

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Abstract
Background: *Neonatal mortality is a major concern in Sub-Sahara Africa and its rates reflect a nation's socio-economic status, efficiency and effectiveness of health care services. Approximately one quarter of all under – five child deaths occur in the neonatal period. This study aims at documenting the pattern of diseases and outcomes of neonates admitted into the Special Care Baby Unit (SCBU) of University College Hospital (UCH) Ibadan from 2007 to 2011.*
Method and Material: *This retrospective descriptive survey involved review of all records of newborns admitted into SCBU for a five-year period. Information extracted includes sociodemographic data, indications for admission, cares rendered; care outcomes and factors influencing outcomes. The outcome variables included survival, discharged against medical advice, complications and death. A checklist was developed to collect data of 1020 neonates.*
Result: *Majority 918(90%) of the neonates was admitted within 24 hours of birthand mostly inborn 775 (76%) but from unbooked mothers 992 (97.3%). Prematurity low birth weight (LBW) 559 (54.8%) and birth asphyxia 196 (19.2%), were the most causes of admissions. Diseases contributing to neonatal death were prematurity LBW (27.4%), respiratory distress (20.6%) and birth asphyxia (17.3%). Overall, survival and mortality was 803 (78.7%) and 192 (18.8%) respectively. Mortality was significantly higher in the first 24 hours of admission and among neonates with LBW ($p < 0.05$).Neonate's birth weight, maternal education, parity and breastfeeding were significantly associated with outcome of care.*
Conclusion: *Prematurity LBW, birth asphyxia, respiratory distress and sepsis were the leading diseases in SCBU and neonatal mortality was 18.8%. Therefore it is suggested that antenatal screening, identification and timely referral of high risk pregnant women and those who are likely to deliver between 24 and 34 weeks of pregnancy for treatment with corticosteroids several days before delivery to prolong their pregnancy and speed up maturation of fetal lungs.*
Keywords: *Pattern, Diseases, Outcomes, Neonates, Special Care Baby Unit, Nigeria*.

I. Introduction

Neonatal disease pattern and outcomes are important indices for adequate health care planning. Outcomes are the changes in health status upon which nursing and or medical care have had a direct influence. The neonatal period is limited to the first 28 days of life in a term neonate or 44 weeks post conceptual age.[1]

The Newborn period is the most hazardous period compared to any other time during the child's first year of life. [2] Neonatal morbidity and mortality continue to be a large component of the burden of disease in Sub-Sahara Africa and its rates reflect a nations socio-economic status, the efficiency and effectiveness of health care services.[3,4] Until recently, newborn health was virtually absent from the global health agenda. Now, assistance agencies, national governments and non-governmental organisations are increasingly addressing this previously neglected issue.[5]

Approximately four percent (4%) of babies annually end up in the neonatal intensive care unit (NICU) .[6]A Neonatal Intensive Care Unit is a unit of a hospital that specializes in the care of preterm and/or critically ill newborn infants.[7] Special Care Baby Unit provides care tonewborns that are moderately ill with problems that are expected to resolve rapidly**.** SCBU of the University College Hospital, Ibadan functions in the capacity of a NICU. The SCBU combines advanced technology and trained healthcare professionals to provide specialized care for the babies.

Evaluation of a public health service includes determining its effectiveness, efficiency, accessibility and equity. The state of Nigerian newborns reflects inadequacy and inaccessibility of the country's overall health services.[8] Newborns that lack appropriate care are at high risk of poor health and reduced productivity in childhood and later in life. This life time consequences have an impact on the health of the individual, the family

and the society.[9] Naturally a healthy child will grow into a healthy adult who shall be able to lead family, society and country in the right direction.

The fear that neonatal survival may not improve in the expected manner appears to be real as neonatal mortality (0-28 days) has not recorded a change similar to infant mortality rate (28 days to first year).[10]The large number of newborns that die and the fact that newborn health has been grossly neglected calls for an urgent need to focus on newborn health.[9] The introduction of SCBU in the UCH Ibadan has provided means whereby acutely ill neonates are taken care of. The unit cares for newborn "inborn" babies delivered in the UCH, Ibadan and "outborn" babies born elsewhere such as home, church and other hospitals. Newborns within 48 hours of birth are admitted into the unit while those above 48 hours are not accepted in the SCBU. It is believed that the latter have been exposed to different types of infection hence they are managed on another ward of the hospital.[3] However, pattern of diseases and care outcomes of neonates admitted to this unit have not been monitored. Hence a need for a report on the care outcomes of neonates admitted to SCBU prompted this study, so that priority areas requiring improved planning of neonatal services could be identified. Also, with further understanding of disease process and development of new therapies, surveillance of up-to date outcomes of the babies would be essential in monitoring the current practice.

This study therefore will assess pattern of diseases and care outcomes of babies admitted into the SCBU, UCH, Ibadan within the period January 2007 to December 2011.

II. Methodology

Design

This is a retrospective descriptive survey that utilizes the admission records/case notes of all newborns admitted into SCBU, UCH, Ibadan from January, 2007 to December, 2011.

Setting

The study was undertaken at the SCBU of the UCH, Ibadan. The University College Hospital is strategically located in Ibadan, the largest city in West Africa which is also the seat of the first university in Nigeria. As a tertiary health care institute, it serves as referral centre to other health centres in Oyo state and others in southwestern Nigeria. The paediatrics department is made up of the following wards; SCBU, Children Emergency Unit, Children Out-patient Unit, $C1^{2nd}$, Southwest two, Southeast two and Northwest two wards. $C1^{2nd}$ admits neonates who are 48 hours to 28 days while Southwest two admits children's with oncology, haematology, respiratory, plastic and infectious diseases e.g HIV/AIDS, tuberculosis etc. Southeast two admits children having problem with gastro intestinal, nephrology, cardiac and surgical problems and Northwest two admits paediatrics with neuro medicine/surgical problems e.g. meningitis, tetanus, spina bivida, hydrocephalous etc. The SCBU is designed to admit and care for babies of all gestational ages and conditions ranging from the extremely preterm and very low birth weight babies to post term infants. It is situated at the fourth floor, the eastern part of the hospital, beside labour ward.

The unit is a divided ward with a maximum capacity of 20 beds. Incubator side contains 10 incubators and cot side contains 10 cots. Three incubators and three cots are designated for isolation. Incubator side is for admission of preterm babies or low birth weight babies of less than 1,500grams and other babies that need intensive care. Babies are transferred from the incubator side to the cot side as their condition improves and as soon as the preterm babies weigh 1,500grams.

Two consultant neonatologists, two senior registrars, four registrars and four house officers are responsible for medical care of the neonates, while an assistant director of nursing, three chief nursing officers and twenty three nursing officers are responsible for nursing care. A registrar and house officers are available for consultation round-the-clock under the guidance of senior consultants. Minimum of three nurses are available at each shift, for the nursing care of the babies. A family centered approach and total patient care model is used to deliver nursing care and support to the neonates and their families.

Babies within 48 hours of birth are admitted into SCBU from the following units: Labour ward, Post natal wards, other hospitals in the city (both private and public) and home via children's emergency unit. The unit is equipped with technology to help neonates cope and survive the critical period. It has two mechanical ventilators, four apnoea monitors, six phototherapy units, resuscitation kits, a radiant warmer, a blood warmer, four suctioning machines, pipeline oxygen and cylinders, electronic and manual weighing scales among others. The special cares offered to babies on admission among others include; nutritional support with breast milk/breast feeding, tube feeding, incubator care, oxygen by face mask or nasal prong, intravenous fluid and electrolyte support, Kangaroo mother care, appropriate and adequate antibiotic therapy

Sample size

There were 1,839 records of newborn babies admitted into special care baby unit during the period under study but only 1,020 newborns had complete records that could be used for the study.

Ethical Approval

Approval was obtained from the University of Ibadan / University College Hospital (UI-UCH), ethical review committee. Permission was also obtained from the chairman of the medical advisory committee, the neonatologist in charge of SCBU, the head, Clinical nursing department and the head, medical records department.

Instrument Development

A checklist was designed by the researchers based on clinical experience and information from literature review. The data reviewed include sex, gestational age at birth, mode of delivery, pregnancy/delivery complications, Apgar score, birth weight and weight at the time of admission. Also place of delivery, indications for admission, duration of stay, care given, care outcomes, age at death for those that died and factors influencing outcomes.

The checklist consisted of five sections. Section A was used to elicit information on the demographic characteristics of the babies and the parent's profile, while Section B was used to document pattern of diseases and indications for admission. Section C was used to gather information on care given to newborns. Section D and E were used to document neonatal care outcomes and factors influencing newborn admission outcomes.

Data collection

The admission registers for the five-year study period were used to retrieve the case notes in batches by the medical record officer. Two trained research assistants and a medical record officer were used for data collection. The checklist was used to document the required information for each of the files. Files with incomplete records were excluded from the study.

Data analysis

Data collected was entered into the computer and coded. Analysis was done using statistical package for social sciences (SPSS) version 17. Descriptive statistics (frequency and percentages) was used to analyze and present variables of interest. Inferential statistics were used to find association among variables of while Pearson chi-square test was employed for hypothesis testing. The following hypotheses were tested;association betweenneonate's birth weight and neonate's care outcomes, mother's educational status and neonate's care outcomes,mother's parity and neonate's care outcome as well as breastfeeding of neonate's and care outcomes.

III. Results

The result indicates that male babies are more 549(53.8%) than their female counterparts 468 (45.9%) with a male to female ratio of 1.2:1. Six hundred and sixteen (60.4%) babies were admitted within one hour and 6 hours of birth, 148(14.5%) were admitted between 6 hours and 12 hours of life while 126 (12.4%) were admitted within12 hours and 24 hours of life. Only 29 (2.8%) of the babies' mothers' had no formal education while others had a minimum of primary 6 certificate. One hundred and eighty (17.6%) of the babies mothers' are unemployed (dependants) while others are employed as seen in Table 1.

Prematurity constituted the greatest diagnosis on admission 559(54.8%), followed by Birth Asphyxia 196 (19.2%), Respiratory distress 68 (6.7%) and Sepsis 54 (5.3%) respectively (table 2).

A total of 775 neonates' (76.0%) were inborn. Though it was observed that a higher number 992 (97.3%) of the inborn neonates mothers were UCH unbooked (Figure 1).

Figure 2 gives the information that, out of 1020 neonates 803 (78.7%) survived and was discharged home in a satisfactory condition while 192 (18.8%) babies died. One hundred and sixty nine (88%) of the neonates died within 24 hours of admission.

A significant association exist between pattern of diseases and neonate's care outcomes ($p<0.05$) as presented in table 3. Most deaths were associated with prematurity LBW (27.4%), Respiratory distress (20.6%) and Birth asphyxia (17.3%) While neonatal jaundice (0%) rarely lead to newborn death in SCBU.

Association between birth weight of the neonate's and care outcomes showed that a significant association exists between birth weight of the neonate's and care outcomes ($p<0.05$) as presented in table 4. This shows that the newborns who weighed less than 1.5kg died most while there was better survival with increasing weight beyond 1.5kg. This is evidence that birth weight of the neonate's has an influence on the care outcomes.

Table 5 revealed that there was a significant association between mothers educational level and neonate's care outcomes ($p<0.05$). This evidently indicates that mother's educational level has an influence on the neonate's care outcomes.

It was shown that a significant association exists between mothers parity and neonate's care outcomes ($p<0.05$) as presented in table 6. The more experience a mother is in terms of parity (i.e. previous child birth) the better the outcome.

Table 7 showed that 788 (77.3%) were breast fed while on admission and 195(19.1%) were not breastfed. A significant association exists between breastfeeding of neonate's and care outcomes ($p<0.05$). This is an evidence that breastfeeding of neonates plays important role in their care outcomes.

IV. Discussion

The findings show that a total of 1839 neonates were admitted in SCBU of UCH Ibadan from January 2007 to December 2011. Complete records were available for 1020 neonates. Among them were 549 (53.8%) male and 468 (45.9%) were female while the sex of 3 (0.3%) neonates could not be determined (ambiguous) with a male to female ratio of 1.2:1. The male predominance in this study is consistent with other studies.This indicates that male neonates are more vulnerable during the neonatal period, a finding in agreement with the well described biological survival of girls in the neonatal period.[11] It could also be as a result of preference for male child by some culture .[12] In some parts of Nigeria they believe that a daughter marries and joins her husband's household and does not retain the name of her own parents. It is the son of the family who will get the inheritance and retain family's name into the future. In view of this male children receive more attention and care while care-seeking behaviours are different for females. However, the result contradicts the findings of in Karachi where female neonates outnumbered their male counterparts with a ratio of 2:1:3. [2]

It was observed in the study that majority of the neonates 918(90%) were admitted within 24 hours of birth. The first 24 hours of life is the transitional period from intrauterine to extra uterine life hence it could be explained, that most of the neonatal problems occur during the first 24 hours of life**.**[13]

Data analysis shows that prematurity low birth weight (LBW) 559 (54.9%) is the commonest cause of admission in SCBU of UCH, Ibadan, followed by Birth Asphyxia 196 (19.2%), Respiratory distress 68 (6.7%), Sepsis 54 (5.3%), Post dates 46 (2.4), Macrosomia 45 (4.4%), Congenital abnormality 12 (1.2%), Neonatal jaundice 11 (1.1%), Neonatal seizures 3 (0.3%) and others 24 (2.4%) respectively.

This result is comparable to similar studies; however the proportion attributable to each cause varies from center to center. In Ebonyi State University teaching hospital Abakaliki, the four leading indication for admission included; septicaemia (26.9%), prematurity and LBW (22.9%), birth asphyxia (20.9%) and unconjugated hyperbilirubinaemia (11.4%).[14]In University of Benin Teaching Hospital, neonatal sepsis, severe birth asphyxia, pre-maturity and neonatal tetanus was reported as the most common morbidities suffered by the neonates.[4] While in Karachi (2012), Prematurity and Sepsis account for the largest number of admission diagnosis.[2]

Looking critically at these studies, it is obvious that prematurity, birth asphyxia and sepsis are among the leading cause of neonatal admission, which are largely consistent with the global pattern of neonatal mortality.[15]

Prematurity topping the list of diagnosis on admission in this study confirms UCH as a referral centre. Neonatal care facilities around and within the town are few, most of them have inadequate facilities and resources for neonatal intensive care in terms of incubators, equipment and staff. Hence most preterm babies are referred to UCH. Care of premature babies requires specialized equipment, highly trained personnel and financial support.[15]

The second and third leading diagnosis in SCBU is birth asphyxia and respiratory distress respectively. This may be due to inappropriate obstetric and neonatal care. Most mothers were unbooked 992(97.3%) and were not referred early to UCH causing the babies to be in distress even in utero before arrival of their mothers to the hospital. In addition, the finding showed that sepsis 54(5.3%) is the fourth commonest disease in SCBU. This further indicates compromised labour and delivery from the referring centres.

The findings of this study reveals that most of the babies admitted during the study period were breast fed (788)77.3% while only 195 (19.1%) were not breast fed. Analysis of hypothesis shows that there is a significant association between breast feeding and neonate's survival $X^2=548.755$, df=2, p-value=0.000. This means that the majority of the babies that had breast milk during admission survived. This shows that breast feeding practice should be encouraged while caring for sick neonates. Breast milk reduces the prevalence of some diseases common in childhood and as such increases child survival rate.[16]Babies are given their own mothers breast milk which they take directly from the breast or expressed and given with cup or through nasogastric tube. Mothers express breast milk that will be enough for their babies before going home or back to their ward at night.

It was revealed that 857 (84.0%) of the neonates' were given intravenous (I.V.) antibiotics and 153 (15.5%) did not receive I.V. antibiotics while on admission. Antibiotics were given prophylactically to babies to prevent nosocomial infection and to those whose mothers had prolonged rupture of membrane. Report shows that the use of antibiotic prophylaxis have contributed to low mortality due to infection.[17]

Figure 2 gives the information that, out of 1,020 neonates admitted in SCBU within the period of study 803 survived and was discharged home accounting for 78.7% neonatal survival, 25 (2.5%) of the babies was discharged against medical advice for personal or financial reasons while 192 babies expired accounting for

18.8% neonatal mortality among total admissions. Majority of the deaths occurred within the first 24 hours 169 (88.5%) of hospitalization suggesting that the babies were admitted in a critical condition especially those delivered by unbooked mothers. Also it is reported that the first 24 hours are the most dangerous of a child's life that carry the highest risk of death.[18] In this study, these could be related to late referral due to paucity of trained personnel and physicians. It could also be as a result of delay in seeking medical advice due to financial constraint or untimely recognition of disease. Furthermore, almost all the private and local government hospitals lack necessary equipment for neonatal resuscitation. They also lack skilled attendants who can encourage and promote kangaroo care. This results in moving the newborn from a place where there is no facility to a place where there is newborn care services. The result also unveil that majority 159 (83.2%) of the babies who died are LBW (weight below 2.5 kg). This may be because preterm LBW babies have immature organs; hence they have difficulty in adapting to extra-uterine life.It could also be due to the quality of care given. LBW infants are three times more likely to die during the first year of life than other children.[19]

In this present study the percentage of survivors in SCBU though encouraging but could be stepped up with adequate treatment and timely intervention. The neonatal mortality in SCBU is 18.8% and majority of the death occurred in the first 24 hours. The result is slightly higher than the findingsfrom Aminu Kano Teaching Hospital, Northern Nigeria in 2007 where they reported 16.9% mortality.[20]The result of this study however is better than the findings ofthe study carried out in Lahore where they reported mortality of 430 (30.9%) and survival of 961 (69.1%).[21]But the findings are not better than the studies inGangtok,[22]Bhopal India[23] and Northern Nigeria[24], that documented mortality of 8%, 9.7% and 4.32% respectively. If the millennium development goal target of a two-thirds reduction in child mortality by 2015 is to be achieved the focus should be to reduce the percentage of newborn deaths to minimum.

The number of babies that went home against medical advice is significant 25 (2.5%). Parents are not expected to take their babies home against medical advice if the facility is client friendly and they are satisfied with the services that is being rendered. Sometimes, parents take their babies home when they cannot cope financially. Whichever was the case, it is necessary for health care providers to give satisfactory care to their clients while free medical services for newborns and their mothers will likely discourage voluntary discharge.

Data analysis reveal that 775 (76.0%) neonates out of the study population were inborns while 245(24.0%) were out borns. Also majority of the inborns were unbooked 992 (97.3%). In other words, the referral hospital can no longer cope with their management. These mothers are likely to give birth to high risk newborns[25]. The babies would have been exposed to a lot of stress and infection thus contributing to majority of the neonates dying during the first 24 hours of life.

Apart from UCH, the major source of admission into SCBU is private hospitals. Most private hospitals within and around Ibadan has no facilities to take care of premature and sick neonates. Neonates are therefore referred to UCH, most often very late predisposing them to hypothermia and infection. This result is not consistent with another study carried out in Southwestern Nigeria (2008) [3], in which neonates delivered outside the hospital setting, outnumbered those delivered inside the hospital.The result is in accordance with the study from Lahore (2011)[21], in which 1124 (80.8%) of the study population were inborn while others were out born.

The study unravel that a significant association exist between pattern of diseases and neonate's care outcomes, X^2=36.578, df= 10, Pv= 0.000, ($p<0.05$). Most deaths were associated with prematurity LBW (27.4%), Respiratory distress (20.6%) and Birth asphyxia (17.3%). This finding is very close to the finding in Gangtok in which the commonest cause of death was prematurity and birth asphyxia respectively.[22] The result however iscounterintuitive to the study in Bhopal India in which sepsis was the major cause of death (31.9%) followed by hyaline membrane disease (HMD) (25.5%) and necrotising enterocolitis (NEC) (9%).[23]Another study reported severe birth asphyxia (21.7%), LBW (20.1%), neonatal meningitis (15.4%) and NNS (11.2%) as the four leading causes of deaths.[25]It could be concluded that the commonest causes of newborn mortality are preventable. Evidence suggest that women who are likely to deliver between 24 and 34 weeks of pregnancy can be treated at least several days before delivery with drugs called corticosteroids, which speed up maturation of fetal lungs.[26]

In Table 4 it was observed that birth weight of the neonate's are associated to the care outcomes X^2 = 1.663, df = 4, p value= 0.000 ($p<0.05$).Evidence in this study shows that the nearer the birth weights of the newborn to 2.5kg the better the chance of survival. Similar observations have been reported in other studies.[27, 24, 28]They confirmed that birth weight is a significant predictor of neonatal outcome.Survival and discharge rates increase as the birth weight increases.

Analyses also confirm that mother's educational level has a significant association with the neonate's care outcomes (X^2=28.450, df=6, p-value=0.000) (Table 5).

In addition, it was observed that the higher the level of education, the higher the percentage of child survival across the educational status. However the mothers who had less than primary 6 education were at variance from the rest of the group i.e. they recorded highest percentage (89.7%) of newborn survival among the groups. Mother's education leads to better health seeking behaviour. Mothers with higher education can

understand better, reason fast and adopt new knowledge and behaviour for the benefit of themselves and their babies than those without education. Several other studies established the influence of maternal education on infant survival. A higher educational level of the parents and an occupation with a steady source of income was found to be protective for the survival of the neonate.[29,30,31]

It was shown in Table 6 that a significant association exist between mothers parity and neonate's care outcomes $X^2 = 9.869$, df=6, Pv=0.046 ($p<0.05$). This means that these mothers are starters and inexperienced and this may affect their child rearing practices such as early recognition of problem and appropriate care seeking. Also analysis shows that place and mode of delivery, pregnancy and delivery complications were significantly associated with outcome of care.

V. Conclusion

This study identifies prematurity LBW, birth asphyxia, respiratory distress and sepsis as the major contributor to neonatal admission. There is relatively greater number of male admission than female. There are more inborns than outborns and most of the inborns were from unbooked mothers.

The survival and mortality in SCBU is 78.7% and 18.8% respectively. The mortality was significantly higher in the first 24 hours of admission and among neonates with lower birth weight. The leading causes of death were prematurity LBW, respiratory distress and birth asphyxia.

The factors influencing neonatal care outcome from this study are socioeconomic factors which include maternal education, occupation and parity. Others are proximate determinants including delivery factors such as place of delivery, mode of delivery, pregnancy and delivery complications, neonatal factors such as sex, birth weight and gestational age at birth. It was also observed in this study that most babies who would have made it with mechanical ventilator had manual ventilation even with the current disproportion of workload to the present working staff. The researcher concluded that most of the causes of newborn admission are preventable like prematurity, birth asphyxia and sepsis. With prematurity LBW as the leading cause of admission as were the main cause of mortality, attempts to prolong pregnancy might improve neonatal outcomes.

VI. Recommendation

In the light of the findings of this study, the following recommendations are made:

1. Creating awareness among all the health workers especially the private practitioners for antenatal monitoring, prompt and timely transfer of "at risk fetus" (i.e. baby in mother's uterus) to enable the mother to deliver close to Special Care Baby Unit where prompt action will be readily available.
2. Nurses must emphasize during health education of pregnant women the signs and symptoms of labour and problems when imminent to ensure early detection and care seeking.
3. High risk pregnant women should be encouraged to deliver in formal health facilities.
4. Improved obstetric care, antenatal screening and identification of women who are likely to deliver between 24 and 34 weeks of pregnancy and treatment with corticosteroids several days before delivery to prolong their pregnancy and speed up maturation of fetal lungs and further reduce incidence of prematurity.
5. The institution should ensure the attendant of a paediatrician in every delivery for prompt and timely resuscitation of babies at birth. This will go a long way to reduce high case fatality and morbidity related to birth asphyxia.
6. There is need for women to be empowered through education of the girl child and continuing education for women; this will help easy comprehension of issues concerning their health which will in turn affect their babies.
7. Government should respond to the triad of unemployment, improvement in the socio-economic condition of the country will ensure a healthy mother and a healthy infant at the end of each pregnancy.
8. Mothers with prolonged rupture of membrane should be induced within 24 hours to reduce sepsis.
9. Exclusive breast feeding of neonates including sick ones should be promoted by health professionals.

Suggestion for further research

Based on the findings of this study, the following suggestions are made:

1. Research work should be undertaken to identify cause-specific neonatal mortality among low birth weight babies.
2. The Knowledge and quality of care given to pregnant women, women in labour and their newborn should be investigated at both primary and secondary level facilities as well as private health facilities.

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Appendix

Table1: Socio-demographic characteristics of neonates

A	**Sex of neonates**	**N**	**%**
	Male	549	53.8
	Female	468	45.9
	Ambiguous	3	0.3
	Total	**1020**	**100**
B	**Age of babies in hours**	**N**	**%**
	0.15-0.59 (less than 1 hour)	28	2.7
	1.01-6 hours	616	60.4
	6.01-12 hours	148	14.5
	12.01-24 hours	126	12.4
	24.01-36 hours	54	5.3
	36.01-48 hours	46	4.5
	48.01-55 hours	2	.2
	Total	**1020**	**100**
C	**Mother's educational level**	**N**	**%**
	University graduate	166	16.3
	Post-secondary certificate (Not university)	231	22.6
	Secondary School	346	33.9
	Primary education	108	10.6
	No formal education	29	2.8
	Not indicated	140	13.7
	Total	**1020**	**100**
D	**Babies' mothers' occupation**	**N**	**%**
	Senior public servant	93	9.1
	Intermediate public servant	151	14.8
	Primary School teacher, driver, Artisan	228	22.4
	Petty trader, Labourer, (junior grades)	327	32.1
	Unemployed (dependants)	180	17.6
	Not indicated	41	4.0
	Total	**1020**	**100**

Table 2: Baby's diagnosis on admission

Baby's diagnosis on admission	**N**	**%**
Prematurity LBW	559	54.8
Birth Asphyxia	196	19.2
Respiratory distress	68	6.7
Sepsis	54	5.3
Post date	46	4.5
Macrosomic neonate	45	4.4
Others	26	2.5
Congenital abnormality	12	1.2
Neonatal jaundice (NNJ)	11	1.1
Neonatal seizures	3	3
Total	**1020**	**100**

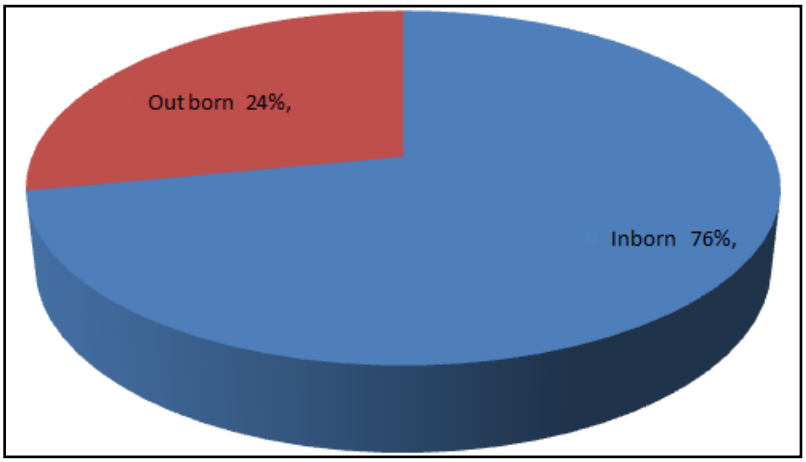

Figure 1: Place of delivery

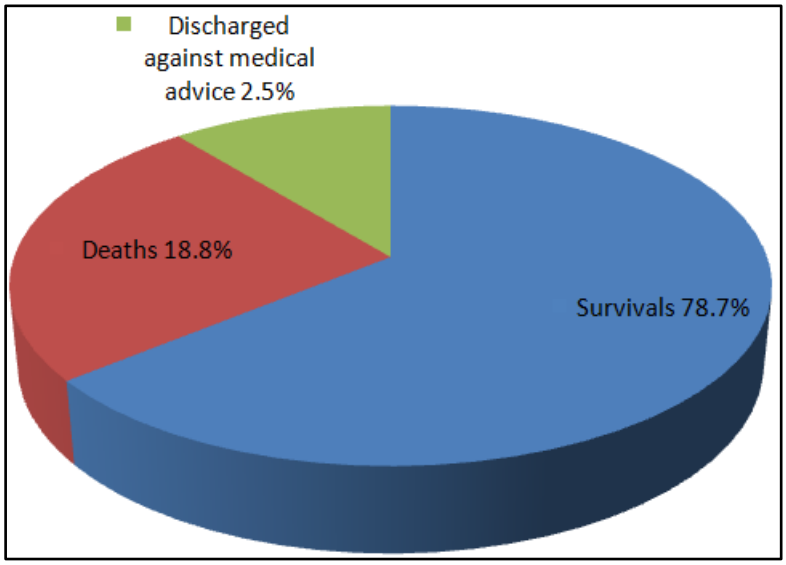

Figure 2: Babies that Survived, Discharged against medical advice and Babies that Died.

Table 3: Pattern of diseases and care outcomes

Diagnosis	**Total**	**Discharged (%)**	**Died (%)**	**DAMA (%)**
Prematurity LBW	559	406 (72.6%)	153 (27.4%)	8 (1.4%)
Birth asphyxia	196	162 (82.7%)	34 (17.3%)	4 (2.0%)
Respiratory distress	68	54 (79.4%)	14 (20.6%)	4 (5.9%)
Sepsis	54	51(94.4%)	3 (5.6%)	0 (0%)
Postdate	46	41(89.1%)	5 (10.9%)	1 (2.2%)
Macrosomic	45	39 (86.7%)	6 (13.3%)	3 (6.7%)
Others	26	25 (96.2%)	1(3.8%)	3 (11.5%)
Congenital abnormality	12	11(91.7%)	1(8.3%)	1 (8.3%)
Neonatal jaundice	11	11(100%)	0(0%)	1 (9.1%)
Neonatal seizures	3	3 (100%)	0(0%)	0 (0%)
Total	**1020**	**803**	**192**	**25**
X^2=36.578, df= 10, P= 0.000				

Table 4: Association between neonate's weight at birth and care outcomes.

Neonate's birth weight	**Neonate's survived and discharged home alive**		**Total**
	YES (%)	NO (%)	
Extremely Low Birth Weight (<1.0 kg)	11 (21.6)	40 (78.4)	51
Very low birth weight (1.0kg-1.5kg)	117 (61.6)	73 (38.4)	190
Low birth weight (1.5kg-2.5kg)	285 (83.6)	56 (16.4)	341
Normal birth weight (2.5kg- 4.0kg)	346 (88.5)	45 (11.5)	391
Big babies(>4.0 kg)	59 (95.1)	2 (4.9)	41
Total	**803 (78.7)**	**217 (21.3)**	**1020**
X^2 = 1.663, df = 4, p value= 0.000			

Table 5: Association between mother's educational status and neonate's care outcomes.

Mothers educational status	**Neonate's survived and discharged home alive**		**Total**
	YES (%)	No (%)	
University graduate	144 (86.7)	22 (13.3)	166
Post-secondary certificate (Not university)	184(79.7)	47(20.3)	231
Secondary school or grade II certificate	245(70.8)	101(29.2)	346
Modern 3 and Primary 6 certificate	82 (75.9)	26 (24.1)	108
<Primary 6 and no formal education	26 (89.7)	3 (10.3)	29
No record	122 (87.1)	18 (12.9)	140
Total	**803(78.7)**	**217 (21.3)**	**1020**
X^2=28.450, df=6, p-value=0.000			

Table 6: Association between mother's parity and neonate's care outcomes

Mother's Parity	**Neonate's survived and discharged home alive**		**Total**
	Yes (%)	**No (%)**	
Nulliparous	318 (75.5)	103 (24.5)	421
Para 1	176 (78.2)	49 (21.8)	225
Para 2	150 (81.1)	35 (18.9)	185
Para 3	101(84.2)	19 (15.8)	120
Para 4 and above	54 (87.1)	8 (12.9)	62
No record	4 (57.1)	3 (42.9)	7
Total	**803 (78.7)**	**217 (21.3)**	**1020**
X^2=9.869, df=6, p-value=0.046			

Table 7: Association between breastfeeding of neonate's and care outcomes.

Breastfeeding care	**Neonate's survived and discharged home alive**		**Total**
	Survived (%)	**Did not survive (%)**	
Breastfed babies	745 (73.0)	43 (4.2)	788
Non- Breastfed babies	36 (3.5)	159 (15.6)	195
Feeding Modalities uncertain	22 (2.2)	15 (1.5)	37
Total	**803 (78.7)**	**217 (21.3)**	**1020**
X^2=548.755, df=2, p-value=0.000			