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Sociodemographic Determinants of Outcome of Newborn Admission in Federal medical Center Owerri, Nigeria

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Abstract

Introduction: *There has been a global decline in infant mortality without an equivalent decline in newborn mortality. Several studies have investigated the influence of each disease entity on childhood mortality concluding that severity of the disease is a major contributor to outcome. However, only few studies have evaluated the influence of social factors in the outcome of newborn hospitalization. This study aimed to investigate the influence of social and some demographic factors on early neonatal hospital admission.*

Methods*: The study was a descriptive retrospective cross-sectional review of clinical records of 170 newborn admitted in to the Special Care Baby Unit of Federal Medical Centre Owerri form May 2014 – May 2015. Case files of all newborn admitted during this period were reviewed and data collated and analyzed using SPSS version 20. Chi-Squared and Odds Ratio were calculated.*

Results*: a total of 170 newborn were admitted, 10 (6.0%) died while 157 (94.0%) were discharged, the outcome of three admissions were missing. Fathers' education and occupation play significant role in neonatal survival OR 3.23 (1.08- 10.06) p-value 0.04 and OR 6.36 (1.83 – 22.17) p-value 0.004 respectively. Newborn of fathers' and mothers with paid employment had better outcome.*

Conclusion: *This study demonstrated that paid employment is associated with better outcome of newborn admission.*

Keywords*: Newborn Admission, Federal Medical Center Owerri.*

Introduction

The first 28 days of live is the most vulnerable period in a child's life.(1) It has been estimated that about 4 million neonates die annually and majority, 98% of these deaths occur in the developing countries.(1, 2) Neonatal Mortality Rate (NMR) in Nigeria is estimated to be as high as 37 per 1000 live births and constitutes about 54% of infant mortality.(3)

The chances of a newborn in the developing countries dying within the first month of life is about six times higher than the same occurring in developed countries; and over eight times higher in the least developed countries (1). Globally there has been steady decline in infant and Under five mortality rate which tends to mirror economic status of the nation thereby leading to a postulation that these decline in infant and U5MR is due to speedy economic growth. (1,2,4).

Nigeria has implemented Several Strategic interventions including Integrated Management of Childhood Illness (IMCI), Safe motherhood, Baby Friendly Hospital Initiative and many others over so many years to reduce Under Five Mortality Rate U5MR. There was observed decline in U5MR over the years however the rate of decline is slower than expected.(5,6). This persistent high U5MR in Nigeria may be linked to high NMR as is estimated that NMR constitutes 53% of infant mortality in Nigeria. (6) Therefore, U5MR may not improve until NMR is reduced. (6)

While medical conditions and nature of illness are important determinants of neonatal survival there might be other socio-demographic factors that influence neonatal hospital admissions and outcome.

Objective

This study tends to probe into the social and demographic factors that may influence immediate outcome among hospitalized newborn in Owerri Imo State Nigeria.

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Subjects and method

Study setting and design

The study was a retrospective review of the clinical records of all newborn admitted in Special Care Baby Unit (SCBU) of Federal Medical Center Owerri over a one-year period from May 2014 – May 2015.

Data collection and analysis

Using the ward admission register, the list of babies admitted in the ward were generated and their case notes pulled out from the Medical Record department. Using a proforma designed for this study, information on age, place of birth, parental education and other demographic variables were extracted and filled into the proforma. Data was cross checked to eliminate errors.

Data were coded and entered into SPSS version 20. Descriptive and inferential analysis were performed. Mean and standard deviations were calculated for continuous variables, Chi-Square and Odds Ratio were used to test for association between categorical variables, Spearman correlation was done to test the direction and strength of association between variables. A p-value of less than 0.05 was set as the tolerable error margin.

Results

Data from 170 case notes were extracted and some folders had missing variables. One hundred (58.8%) of the subjects were male, 70 (41.2%) were female, 83(48.5%) of mothers and 71 (41.5%) of fathers had tertiary level of education. Majority of parents 104 (66.7%) fathers and 61 (38.1%) mothers were in the informal pay sectors as artisans, traders or self-employed workers. 157 (94.0%) were discharged home while 10 (6.0%) died in the course of admission, all the reviewed patients paid out-of-pocket Table 1.

Table 1. General Characteristics of Research Participants

Variables	**Proportion n(%)**
Gender	
Male	100 (58.8)
Female	70 (41.2)
Place of Birth	
Outborn	86 (51.2)
Inborn	82 (48.8)
Mothers level of Education	
Primary	7 (4.4)
Secondary	68 (43.0)
Tertiary	83 (48.5)
Mothers Occupation	
Student	22 (13.8)
Unemployed	47 (29.4)
Artisan, Trader, Self Employed	61 (38.1)
Civil Servant, Paid Employee	30 (17.5)
Fathers level of Education	
Primary	15 (9.9)
Secondary	66 (43.4
Tertiary	71 (41.5)
Fathers Occupation	
Student	2 (1.3)
Unemployed	3 (1.9)
Artisan, Trader, Driver, Self Employed	104 (66.7)
Civil Servant, Paid Employee	47 (30.1)
Antibiotic Use	
None	9 (5.6)

Ampicillin Based	36 (22.4)
Cephalosporin	108 (67.1)
Both	8 (5.0)
Hospitalization Outcome	
Discharged	157 (94.0)
Died	10 (6.0)
Mode of Payment	
Out-of-pocket	168 (100)

The age at presentation ranged from approximately 1 minute (0.02 hrs) to 5 days (120hrs), gestational age ranged from 23 to 42 weeks and birth weight from 0.50 to 4.5kg as displayed in table 2.

Table 2. Diagnosis within the period

Variables	Min	Max	Mean	STD Dev
Age at presentation (hrs)	0.02	120.00	19.98	28.09
Gestational Age (weeks)	23.00	42.00	36.38	4.13
Birth Weight (kg)	0.50	4.50	3.24	2.10

Perinatal asphyxia and prematurity were the leading cause of newborn admission in the facility contributing 35.4% and 32.3% of all admissions respectively. Jaundice caused 9.4% of cases while the least occurring illness was neonatal meningitis as displayed in figure 1.

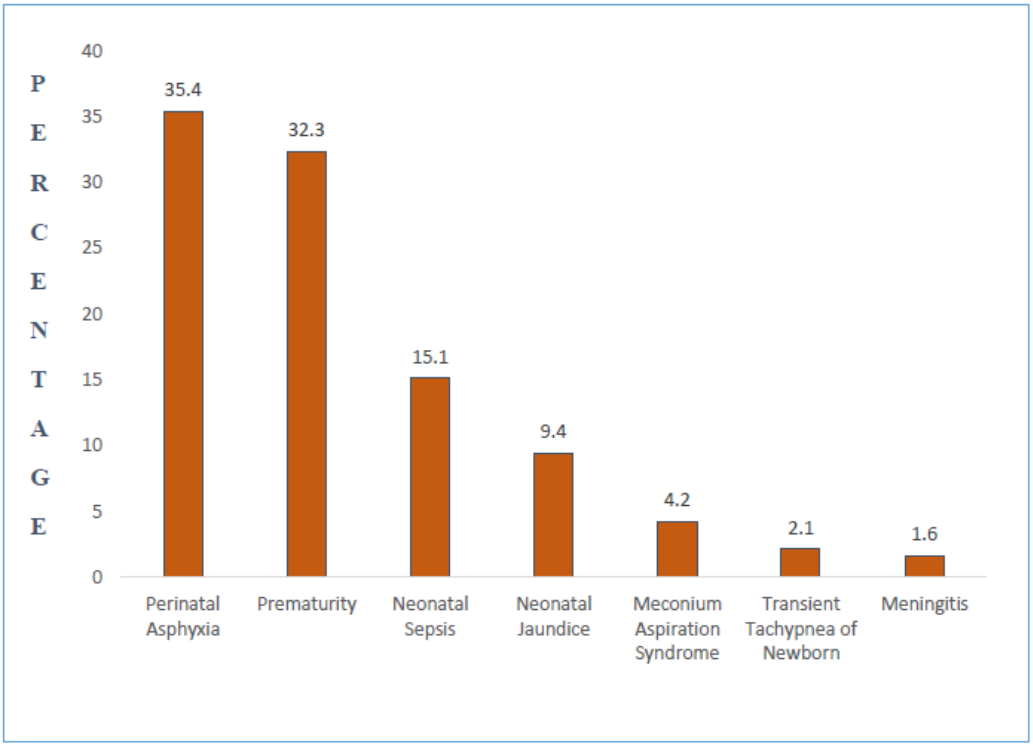

Figure 1. Distribution of Clinical Diagnosis among Participants

All Children (46; 100%) whose Fathers had paid employment survived, 5(5%) of those whose fathers were in the informal sector died. Frequency of neonatal death was highest among neonates whose fathers were unemployed or student 1 (33%) and 1 (50%) respectively p – value 0.016. There was also a significant association between birth weight and outcome. Better survival was observed among neonates of parents (mothers and fathers) with higher level of education but this did not achieve statistically significant level. Proportion of neonatal death was also found to be higher among those who presented more than 1 hour after birth when compare with those who came within 1 hour however this did not achieve statistically significant level p-value 0.50. Gender and place of birth were not significant factors for death or survival in this study as show in table 3 below.

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Table 3. Association between outcome and socio-demographic factors

Variable	Outcome (n/%)		χ^2	OR (95%CI)	p-value
	Died	**Discharged**			
Gender					
Female	5 (7.2)	64 (92.8)	Fisher Exact Test		
Male	5 (5.2)	92 (94.8)		1.44 (0.40-5.17)	0.74
Place of Birth					
Outborn	7 (8.2)	78 (91.8)	Fisher Exact Test	3.45 (0.70-17.16)	0.17
Inborn	2 (2.5)	77 (97.5)			
Mothers' level of Education					
Primary	1 (16.7)	5 (83.3)			
Secondary	4 (6.0)	63 (94.0)	2.49¥	3.15(0.29-33.80)	0.27
Tertiary	2 (2.5)	79 (97.5)			
Mothers' Occupation					
Student	1 (4.5)	21 (95.5)			
Unemployed	2 (6.7)	43 (95.6)			
Artisan, Trader, Self Employed	4 (6.7)	56 (93.3)	3.25¥	1.24(0.56-2.76)	0.59
Civil Servant/ Paid Employee	0	29 (100.0)			
Fathers' Education					
Primary	3 (21.4)	11 (78.6)			
Secondary	2 (3.1)	63 (97.1)	5.87¥	3.23(1.08-10.06)	0.04*
Tertiary	2 (2.9)	67 (97.1)			
Fathers' Occupation					
Student	1 (50.0)	1 (50.0)			
Unemployed	1 (33.3)	2 (66.7)			
Artisan, Trader, Self Employed	5 (5.0)	96 (95.0)	10.37¥	6.36(1.83-22.17)	0.004*
Civil Servant, Paid Employee	0	46 (100.0)			
Birth Weight					
ELBW	2 (100.0)	0			
VLBW	2 (9.1)	20 (90.9)			
LBW	0	48 (100.0)	17.68¥	3.4(1.6-16.70)	0.001*
NORMAL	5 (6.0)	78 (94.0)			
HIGH	1 (9.1)	10 (90.9)			
Time to Admission					
Less than 1 hour	2 (3.8)	51 (96.2)	Fisher	0.52 (0.10- 2.57)	0.50
More than 1 hour	7 (7.1)	92 (92.9)			
Gestational Age					
Preterm	5 (7.8)	59 (92.2)			
Term	2 (2.7)	73 (97.3)	2.94¥	3.4(0.69-16.69)	0.13
Postdate	0	10 (100)			

¥ - Likelihood ratio

* Statistically Significant

There is positive correlation between parental education, income and Hospitalization Outcome however only fathers' occupation achieved statistically significant level. Fathers' occupation can significantly influence the outcome of neonatal admission up to 22% as shown in table 4 below.

Table 4. Spearman Correlation between Fathers' Education/Occupation, Mothers' Education/Occupation and Hospitalization Outcome

Variables	Hospitalization Outcome	
	rho	p-value
Fathers Education (N = 148)	0.15	0.08
Fathers Occupation (N = 152)	0.22	0.007*
Mothers Education (N = 154)	0.12	0.14
Mothers Occupation (N = 156)	0.04	0.60

rho Spearman Correlation Coefficient

Discussions

This study aimed to investigate the sociodemographic contributors to outcome of neonatal hospital admission. It is a well-known fact that the nature of illness and quality of care are the major determinants of neonatal admission. (4,5) The finding from this study shows that perinatal asphyxia, prematurity and neonatal sepsis are the leading cause of hospitalization among newborns. This is in keeping with the report from WHO Health report of 2005. (7).

Case notes of 170 newborn admitted into the newborn unit during the study period were reviewed. Ten (6.0%) of the admitted neonates died while 157 (94.0%) were discharged home. More deaths occurred among outborns and those who presented more than 1 hour after delivery than among inborn patients and those who presented within 1 hour after delivery. Variation in skill mix and time to quality intervention could be the cause of this observed difference.

Neonatal deaths were more common among parents with lower educational status. It was found to be 16.7% among babies born to mothers with primary education and 2.5% among babies of mothers with tertiary education. Similarly, it was found to be higher when the father had only primary education 21.4% compared to 2.9% when father had tertiary education. Fathers' education achieved a significant level while mothers' education did not. This is similar to findings by Shah et.al where maternal education played a significant role in contributing to neonatal death. (8)

A key finding from this study is that fathers' occupation and education were significant factor to neonatal survival. Neonatal mortality was also found to decrease as maternal education increased, also neonatal death was lower among mother and fathers with paid employment (formal sector) when compared to those the informal sectors. This is similar to finding by Oyabanmi et.al where women in civil services and those with higher education had better awareness and perception of Pentavalent Vaccines and immunization. (9) The African culture where men are the major decision makers could play a role; as such educated male are more likely to make better health choices. The influence of occupation could be explained by the fact that paid employees are relatively certain of the amount and time of the next income and as such are more likely to present at the hospital earlier than the person in the informal sector. Organized nature of the work environment in the formal sector might also influence the thought, behavioral and response habit of the people. This is similar to the research by Karasek which suggested that the impact of the workplace on employee health and wellbeing demonstrates that the sense of control employees have over their work, along with the demands of the workplace, combine to affect the likelihood of job strain and subsequently the likelihood of workplace stress.(10) These postulations could have interacted in a complex manner to lead to a better neonatal outcome among educated parents and those in paid employment. Mode of payment might not be the determining factor in this context as most of the subjects paid Out-of-Pocket. However, this is not to undermine the importance of health insurance policy in improving health indices.

Birth weight was also found to be major factor in neonatal death. Mortality was highest among the extreme low birth weight neonates. This is in line with the well-known fact that lower birth weight carries a major risk of morbidity and mortality. Mortality was 100% in extreme low birth weight while equal proportion of death was recorded among very low birth weight and high birth weight neonates. This indicated that the relationship between birth weight and neonatal mortality might not direct but a parabola. From this study it could be postulated that high birth weight and very low birth weight carry similar risk higher risk of neonatal death which is higher than low or normal birth weight.

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Conclusion

Perinatal asphyxia is the leading cause of death among neonates followed by prematurity and neonatal sepsis. Neonatal death is lower among fathers as well as mothers with higher education. Individuals with paid employment recorded lower rate of neonatal death.

Therefore, policies that improve both boys' education is as important as girls' education in improving neonatal survival. An organized system that accommodates more people into the formal employment sector will improve overall neonatal outcome.

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