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Profile of Stillbirth in a Referral Center in the Niger Delta Region of Nigeria

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Abstract

Background: The rate of stillbirth in developing countries of Sub-Saharan Africa and South Asia remains a far cry from the rate of 12 per 1000 deliveries recommended by the United Nations. This tragedy results largely from inadequate maternity care services or failure to utilize available services in affected countries. **Objectives:** The aim of this study was to determine the stillbirth rate in the study center and to assess factors that were associated with the delivery of a stillborn infant. **Method:** This study was a retrospective descriptive study where mothers who had stillbirth were identified for in depth study of their clinical records. **Results:** The stillbirth rate was 67.5 per 1000 deliveries in the study center during the period under review. The majority (39.7%) of the mothers were aged 26 – 30 years, and more than half (54.7%) were multiparous. Over half (58.5%) of the deliveries were delivered at term and 46.4% of the mothers were un-booked. A vast majority (63.0%) of the infants were normal weight, while 54.6% were males. Macerated stillbirth accounted for 55.7% of the stillbirths. Multiparous women and women who delivered un-booked significantly had stillbirths ($p = 0.000$). **Conclusion:** The stillbirth rate in the study center was very high and this was commoner among multiparous women and women who did not receive antenatal care during pregnancy.

Keywords: Stillbirth, Antenatal Care, Associated Factors, Referral Center, Nigeria

Introduction

Human development and expansion in medical knowledge have made their contributions to safe motherhood. This is essential because every pregnant woman desires to be delivered of a healthy infant at the end of her pregnancy. Antenatal care has the major objective of ensuring optimal health outcomes for the mother and her baby (Statistics, 1977). When properly designed and executed, antenatal care helps to monitor the pregnancy and reduce morbidity risks for the mother and the child during pregnancy and delivery (Statistics, 1977; Goldenberg and McClure, 2018). Even though, prevention of stillbirth is not identified as a primary goal of antenatal care, it does help to reduce the

incidence of stillbirth, as less frequent visits, especially in the third trimester of pregnancy has been shown to be associated with a higher risk of stillbirths (Olusanya and Solanke, 2009; Goldenberg and McClure, 2018).

The huge burden of stillbirths, which is put at 3.2 million pregnancies per year globally is borne mainly by developing countries, where antenatal care is largely inadequate (Olusanya and Solanke, 2009; Suleiman, Ibrahim and Abdulkarim, 2015; Wolde *et al.*, 2018). Sub-Saharan Africa where Nigeria is situated and South Asia have the largest incidence of stillbirths, and about a third of such adverse pregnancy outcome occur intra-partum (Olusanya and Solanke, 2009; Suleiman, Ibrahim and Abdulkarim, 2015; Wolde *et al.*, 2018). Stillbirths occurring intra-partum are often a reflection of inadequate antenatal care and or suboptimal supervision of labor and delivery (Goldenberg, McClure and Bann, 2007).

Perinatal mortality, which comprises stillbirths and neonatal deaths occurring within the first week of life is an index of assessing the quality of obstetric and neonatal care in a maternity unit (Joy E Lawn, Simon Cousens, Jelka Zupan, 2005; Goldenberg, McClure and Bann, 2007; Olusanya and Solanke, 2009). This as expected is disproportionately high in developing countries owing to underutilization of antenatal care services and suboptimal quality of intra-partum (Joy E Lawn, Simon Cousens, Jelka Zupan, 2005; WHO, 2006).

A double-prong approach of holistic antenatal care and vigilant intra-partum care are desirable for effective prevention of stillbirths (Di Mario, Say and Lincetto, 2007; Ezugwu *et al.*, 2011; Goldenberg and McClure, 2018). Antenatal care, tailored to make provision for more frequent visits after the 36 weeks of gestation has been found to be associated with less incidence of stillbirths (Di Mario, Say and Lincetto, 2007; Ezugwu *et al.*, 2011; Vogel *et al.*, 2013; Goldenberg and McClure, 2018). Similarly, confinement in an accredited health facility where skilled maternity care attendants are available is essential for the reduction of stillbirths that occur during the intra-partum period (Tayelgn, Zegeye and Kebede, 2011; Hailemichael, Woldie and Tafese, 2013; Ballard *et al.*, 2016; Kayode *et al.*, 2016).

Even though, several advocacies have been made for the reduction of the incidence of stillbirths across the world, stillbirths continue to occur due to suboptimal maternity care, prevalent especially in Sub-Saharan Africa and South Asia (Mullan and Horton, 2011; Kayode *et al.*, 2016). This obnoxious adverse pregnancy outcome continues to occur in countries of the world where socio-economic deprivations and inadequate health care resources are prevalent. Stillbirth brings in its wake a sense of loss and grief to expectant parents and by extension the family, which may have prepared with joy to welcome a new entrant into the family (Samuelsson, Rådestad and Segesten, 2011). Stillbirth might therefore be a source of grief and sorrow, which if unchecked could result in long term psychological problems for the parents (Trulsson and Rådestad, 2004; Samuelsson, Rådestad and Segesten, 2011).

Considering the clinical importance of stillbirth, it is desirable to prevent its occurrence (Lavin and Pattinson, 2018). In spite of many calls for efforts to eliminate stillbirths across the world, the occurrence of stillbirth in maternity units in Nigeria does not seem to abate (Bhutta *et al.*, 2011; Pattinson *et al.*, 2011). This study was therefore designed to assess the incidence of stillbirth in the study center during the period under review, as well as to identify factors that were associated with the delivery of a stillborn infant. Findings of this study would help the study center to appraise its performance against the backdrop of the need to consider lowering the stillbirth rate to an acceptable level.

Method

This was a retrospective study of stillbirths in the Maternity unit of the University of Uyo Teaching Hospital over a six year period from 1st January 2012 to 31st December 2017. Approval to conduct the study was obtained from the Ethical Committee of the University of Uyo Teaching Hospital.

The University of Uyo Teaching Hospital is located in Uyo, the state capital of Akwa Ibom State, which is situated in the Niger Delta region of Nigeria. The Niger Delta region of Nigeria is located in the South – east health zone of the country. It is the only health facility providing tertiary level health care in the state. The inhabitants of Uyo are mainly the Ibibios, the Annangs and the Oro people of the state. There are a minority of other Nigerian tribes like the Efiks, the Igbos, the Yorubas and the Hausas. Most inhabitants of Uyo are business people, public servants

and professionals. Other inhabitants are artisans, traders, farmers, students and the unemployed. Akwa Ibom state has an estimated population of 5.5 million people (Saleem *et al.*, 2018).

Data collection and analysis

The delivery register in the labor ward for the period under review was retrieved for analysis. All mothers who delivered stillborn infants between 1st January 2012 and 31st December 2017 were identified. The clinical folders of such mothers were retrieved from the records unit of the hospital for in depth study. Information such as demographic characteristics, obstetric parameters, mode of delivery and neonatal outcome were extracted using a pro forma. Information obtained are expressed in Arabic numerals, simple proportions, percentages and frequencies.

Stillbirth was defined as the delivery of an infant without any sign of life, occurring at and after the 28 weeks of gestation, irrespective of the mode of delivery. Only stillborn singletons were included in the computation of the stillbirth rate.

The minimum sample size was determined using the Kish Leslie formula recommended for cross sectional studies and the minimum sample size of 96.72 subjects was obtained. The study population exceeded the minimum sample size in order to improve the reliability of results obtained from the study. Missing data were negligible.

The results are presented in tables and a pie chart. Data obtained were analyzed with descriptive statistics. The Chi-square test was used to assess for any association between categorical variables. Statistical significance in the differences between selected maternal, obstetric and neonatal parameters and incidence of stillbirth were considered at a p- value of less than 0.05.

Results

During the six years period of the study, 11,886 mothers delivered 12,243 babies. Out of this number, 853 babies were delivered stillborn by 831 mothers. There were 801 singletons, 23 twins and 2 triplets. This gave a stillbirth rate of 67.5 per 1000 deliveries in the study center during the period under review, excluding the twins and triplets. Table 1 shows the socio-demographic parameters of mothers in the study population. The majority (39.7 %) of the mothers were young women, who belonged to the age range of 26 to 30 years and more than half (54.7 %) of the mothers were multiparous women. Among all deliveries, 58.5 % of the women were delivered at term. Nearly half (46.4 %) of the mothers were un-booked. Obstetric parameters and characteristics of the fetus are presented in table 2. The majority (49.9 %) of the infants were delivered vaginally as against caesarean delivery, which contributed 39.9 % of all the deliveries. A vast majority (63.0 %) of the infants were normal weight with male infants contributing 54.6 % to the total number of stillborn infants recorded. Table 3 shows the computation of association between obstetric parameters and neonatal outcome with regard to whether it was fresh stillbirth (44.3%) or macerated stillbirth. There was a highly statistically significant difference in the prevalence of macerated stillbirth among mothers who were delivered vaginally, when compared to those who were delivered through caesarean section, $p= 0.000$. Multiparity ($p= 0.027$) and un-booked status (0.024) of the mothers had significant association with prevalence of stillbirth in the study population.

Table 1: Socio-demographic characteristics of mothers who had stillbirth in the study Center

Characteristics	Frequency	Percentage
<u>Age</u>		
≤ 20	76	9.2
21-25	198	24.0
26-30	328	39.7
31-35	158	19.1
36-40	64	7.8

> 40	2	0.2
<u>Parity</u>		
0	40	4.9
1	248	30.0
2-4	452	54.7
5-7	75	9.1
>7	11	1.3
<u>Booking Status</u>		
Booked	338	40.9
Un-booked	383	46.4
Referred	78	9.4
Defaulted	27	3.3
<u>Gestational Age (Weeks)</u>		
28-33	167	20.2
34-36	145	17.5
37-42	483	58.5
>42	31	3.8
Total	826	100.0

Table 2: Obstetric parameters and characteristics of the fetus in the study population

Characteristics	Frequency	Percent
<u>Fetal Presentation</u>		
Cephalic	702	82.3
Breech	112	13.1
Abnormal fetal lie	39	4.6
<u>Delivery Mode</u>		
Vaginal	412	49.9
Abdominal	330	39.9
Operative vaginal delivery	84	10.2
<u>Pregnancy Type</u>		
Singleton	801	97.0
Twins	23	2.8
Triplets	2	0.2
<u>Sex of neonate</u>		
Male	466	54.6
Female	387	45.4
<u>State of the Neonate</u>		
Fresh Still Birth	378	44.3
Macerated Still Birth	475	55.7
<u>Birth Weight</u>		
<1Kg	8	0.9
1-1.5kg	86	10.1
1.6-2.4kg	160	18.7
2.5-4.0kg	537	63.0
>4 kg	62	7.3
Total	853	100.0

Table 3: Association between obstetric parameters and neonatal outcome in the study population

Characteristics	Neonatal outcome			Test statistic
	^α FSB	[¥] MSB	Total	
<u>Age group (in years)</u>				X ² = 0.0901
Less than 35	316 (86.24)	396 (86.20)	712	P= 0.764
35 and above	52 (13.76)	62 (13.80)	114	
<u>Delivery Mode</u>				X ² = 17.787
Vaginal	196 (51.85)	314 (66.11)	510	P= 0.000
Abdominal	182 (48.15)	161 (33.89)	343	
<u>Parity</u>				X ² = 4.878
0-4	309 (84.39)	408 (86.80)	744	P= 0.027
≥5	59 (15.61)	50 (13.20)	109	
<u>Sex of neonate</u>				X ² = 0.1202
Male	204 (53.97)	262 (55.16)	466	P= 0.729
Female	174 (46.03)	213 (44.84)	387	
<u>Birth weight</u>				X ² = 1.598
< 1 kg	2 (0.53)	6 (1.26)	8	P= 0.809
1-1.5kg	39(10.32)	47 (9.89)	86	
1.6-2.4kg	68 (17.99)	92 (19.37)	160	
2.5-4kg	242 (64.02)	295 (62.11)	537	
>4kg	27 (7.14)	35 (7.37)	62	
<u>Booking Status</u>				X ² =9.406
Booked	145 (39.15)	194 (42.95)	339	P=0.024
Un-booked	189 (51.59)	194 (42.53)	383	
Referred	25 (6.61)	52 (10.95)	77	
Booked but defaulted	10 (2.65)	17 (3.58)	27	
<u>*GA (in weeks)</u>				X ² = 6.363
28-33	73 (19.31)	94 (19.79)	167	P= 0.095
34-36	65 (17.20)	80 (16.84)	145	
37-42	221 (61.64)	262 (58.32)	483	
>42	7 (1.85)	24 (5.05)	31	

*GA stands for gestational age.

^αFSB stands for fresh stillbirth.

[¥]MSB stands for macerated stillbirth.

Discussion

The prevalence of high stillbirth rates in developing countries of the world are due largely to inadequate maternity care. This malady is often associated with a sense of grief to affected families and a negative impression of modern maternity care in affected centers. The stillbirth rate of 67.5 per 1000 deliveries obtained in this study was much higher than the rate of 25 per 1000 deliveries recognized for low income and middle-income countries (Saleem *et al.*, 2018). This rate is also a far cry from the stillbirth rate of 12 per 1000 deliveries recommended by the United Nations' Every Newborn Action Plan, which has set this goal to be attained in 2030 by all countries (Akombi *et al.*, 2018; Saleem *et al.*, 2018). The stillbirth rate of this study in Uyo, South-east health zone of Nigeria is comparable to the rate of 74 per 1000 deliveries that was obtained in Enugu, South-east Nigeria, probably because both study centers in Nigeria belong to the same health zone. In contrast, an Ethiopian study recorded an impressive low stillbirth rate of 21.8 per 1000 deliveries in a survey across health centers, hospitals and homes (Vogel *et al.*, 2013). The low stillbirth rate recorded in Ethiopia may have been influenced by the method used for the rural community- based questionnaire-centered survey, which lasted for only 8 months and enquiry about stillbirths

covered only the preceding 12 months (Vogel *et al.*, 2013). The majority (58.5%) of the stillborn infants in this study were delivered at term with 46.4% of the mothers being un-booked as against a slightly higher term stillbirth rate of 66.8% recorded in Lagos, South-west Nigeria and a much lower rate of 2.8% among un-booked mothers (Olusanya and Solanke, 2009; Vogel *et al.*, 2013). The majority (49.9%) of women in this study population were delivered vaginally, with 63.0% of infants having normal birth weight and 54.6% being male infants. This was different from the situation in South Africa, where stillbirths were found to decline after 31 weeks of gestation and peaked at 38 wks. However, in the South African study, analysis based on sex of infants who were stillborn was not computed, even though the study design was an audit where the role of antenatal care in the prevention of stillbirth rate in the country was being investigated (Lavin and Pattinson, 2018). The proportion of fresh stillbirths suggesting intra-partum implication in their occurrence was 44.3% as against 55.7% of macerated stillbirth in this study. Although this retrospective study could not evaluate the proportion of stillbirth that occurred intra-partum, the result contrasted sharply with the results from Lagos, South-west Nigeria, where macerated stillborn infants contributed a mere 1.4% to the stillbirth rate in that study (Olusanya and Solanke, 2009). The higher population of macerated stillbirth rate in this study is a reflection of inadequate antenatal care as shown by the large proportion of un-booked mothers in the study population (Olusanya and Solanke, 2009). Macerated stillbirth rate tends to increase in most referral maternity centers as a result of the pooling together of hitherto poorly managed and complicated cases to such centers from lower levels of maternity care in the health care system. Where referrals within the healthcare system are not appropriately utilized as is obtained in Georgia where referrals to primary care providers are low, the effectiveness of that healthcare system could be reduced (Verulava *et al.*, 2019). Notwithstanding, an institutional based study in Enugu, South-east Nigeria had recorded 47.7% of macerated stillbirth as against a fresh stillbirth rate of 52.3% (Goldenberg, McClure and Belizán, 2009; Ezugwu *et al.*, 2011). Complications of pregnancy resulting in intrauterine fetal demise and macerated stillbirth have been elaborately studied (Olusanya and Solanke, 2009; Ezugwu *et al.*, 2011; Kayode *et al.*, 2016; Akombi *et al.*, 2018; Kaiser, 2018). A vast majority (66.11%) of the macerated stillborn infants were significantly ($p=0.000$) delivered vaginally, suggesting there were no contraindications to vaginal delivery, but a great proportion (57.1%) of the mothers did not receive antenatal care in the center. Multiparity and un-booked status of the mothers were significantly associated with stillbirth. The preponderance of stillbirths among multiparous women in the study is probably a reflection of their high proportion in the study population, rather than as an independent risk factor. The association of stillbirth with women who failed to receive antenatal care was similar to what was obtained from other studies (Ezugwu *et al.*, 2011; Vogel *et al.*, 2013). In the Enugu, South-east Nigerian study, the odds of an un-booked mother being delivered of a stillborn infant was 1.56, $p=0.04$, whereas parity was not significantly associated with the odds of stillbirth occurring (Ezugwu *et al.*, 2011). On the other hand, a community based survey of 3 East African countries found, low level of education, advanced maternal age, smoking and drinking, as well as non-availability of potable water as risk factors that predisposed mothers to have stillbirth in that study (Akombi *et al.*, 2018). Notwithstanding the preponderance of stillbirths among mothers with those risk factors, these may have confounded with their socioeconomic circumstance, which could have undermined their ability to receive quality antenatal care. The application of the results of this study is limited by the fact that it is essentially a review, and findings may not have a global implication.

In conclusion, stillbirth rate in the study center was 67.5 per 1000 deliveries. Stillbirth was more common in young multiparous women, who were delivered at term vaginally of normal weight male stillborn infants. The majority of the stillborn infants were macerated and delivered by mothers who did not receive antenatal care. The reduction of the high prevalence of stillbirth in our maternity care system would require a multidisciplinary approach involving the education and public enlightenment of women to see the need to book and receive regular antenatal care in pregnancy in order to provide an opportunity for identification of risk factors for intrauterine fetal death for possible intervention. Efforts should also be made to ensure vigilant intra-partum care for all pregnant women in labor in Nigeria. Following the publication of this research, findings shall be sent to the Nigerian Federal Ministry of Health to advocate for improved maternity care, starting from Traditional Birth Attendants centers, through general hospitals to specialist hospitals across the South-east health zone of the country. Such a strategy has the potential to reduce the prevalent unacceptably high stillbirth rates in the South-east zone of the country.

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