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Research Article

Socio-Demographic Determinants of Antepartum Fetal Death

Abstract

Background: Antepartum fetal death (AFD) contributes significantly to stillbirths (SB) in low- and middle-income countries (LMIC). Modifying locally-prevalent demographic risk factors could lessen the burden of SB in the region.

Objective: This study seeks to identify the prevalence and modifiable socio-demographic risks for antepartum fetal death (AFD) in a Nigerian setting with the aim of recommending appropriate interventions to reduce the burden.

Method: Hospital-based 6 year (2009-2014) review of obstetric records at Ekiti State University Teaching Hospital (EKSUTH), Nigeria.

Results: Stillbirth (SB) rate was 29/1000 births and AFD rate was 22.5/1000 birth. AFD was more among women with age ≤20years (93.8%), who had no antenatal care (83.2%), single (92.3%), with no formal education (95.6%), unskilled occupation (81.1%), parity ≥ 5 (92.3%), those with prior history of SB (81.0%) and Muslims (81.8%). Logistic regression analysis showed that absence of antenatal care (AOR: 3.32, 95% CI: 1.80-6.21, P<0.001) and lack of formal education (AOR: 0.18, 95% CI: 0.03-0.64, P= 0.005) significantly predict likelihood of AFD.

Conclusion: Absence of antenatal care and lack of formal education are associated with AFD during pregnancy. Educating women and health promotion towards improving the utilization of antenatal services can remarkably reduce the burden in low-resource settings.

Introduction

Delivery of a still baby marks the tragic end of many months of joyful anticipation and the beginning of, sometimes un-abating, grief for the affected family. But, despite the serious adverse impact stillbirth (SB) could have on families, appropriate recognition is not given to it in the Global Burden of Disease, yet when compared with communicable and non-communicable causes of death worldwide, SB would rank fifth among the global health burdens – ahead of diarrhoea, HIV/AIDS, tuberculosis, traffic accidents and any form of cancer [1].

Globally, up to three-quarters of all babies born dead died before labour began, with intra-partum deaths making up the remaining [2]. Estimates from a multi-centre intercontinental study show that 98% of the 3.2 million SB that occur annually are in low- and middle-income countries (LMIC) with the heaviest burdens occurring in South Asia and Africa [3].

In the West African sub-region for example, SB accounts for 62% of perinatal deaths, out of which close to half are antepartum fetal death (AFD) [4,5]. Within the sub-region, on some occasions the baby's death is attributed to handiwork of evil spirits. However, often the grief of the families is compounded by social stigmatization that the SB was as a result of maternal sins [6].

Some authors that evaluated strategies for prevention of SB concluded that recognition of risk factors, including modifiable socio-economic risk, will assist in identifying women in need of specialized care, surveillance and/or interventions to improve outcomes and prevent SB [7-9]. In spite of the recommendation, few studies from West Africa have looked into identifying socio-demographic risks for AFD. At least, having the knowledge of modifiable demographic factors that could predispose a baby to dying before onset of labour and appropriately addressing them could assist in lessening the burden of SB on families in the region. This study therefore sought to provide the insight with the aim of making necessary recommendations.

Method

This six-year (2009-2014) retrospective review of cases of AFD was done at the Ekiti State University Teaching Hospital

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(EKSUTH), Ado-Ekiti, southwest Nigeria. The tertiary health facility receives referrals of high-risk and complicated pregnancies from within the state and neighbouring states like Osun, Ondo and Kogi. It has a 45-bedded obstetric unit and average deliveries of 2000 annually.

An initial review of all obstetrics cases from 2009 to 2014 was done out of which cases of SB were identified from the maternity registers. Their case records were then retrieved from the Health Information Management Department of the hospital. In accordance with the recommendation of the World Health Organization (WHO), for international comparison, SB was defined as the birth of a baby with a birth-weight of 1000g or more, 28 weeks' gestation or more, or a body length of 35cm or more, who died before or during labour and birth [10].

Cases that met the criteria were reviewed to identify the subset that had AFD, defined as fetal death after 28weeks gestation but before onset of labour. Using a prepared study proforma, information on socio-demographic characteristics of the women - age, educational status, occupation, gestational age at SB, prior history of SB, antenatal booking status, etc, was obtained. The data were subsequently entered into the Statistical Software for the Social Sciences (SPSS) version 17 and frequency table with cross-tabulations were generated. In other to predict the modifiable factors for antepartum fetal death in our environment, multiple linear regression analysis was done using maternal age, antenatal booking status, marital status, educational level, occupation, number of children alive, prior history of SB and religion. Thereafter, to consolidate the statistical findings, the selected socio-demographic characteristics of the women who had antepartum fetal death were entered into binary logistic regression model. Using the bivariate and multivariate statistical methods, deductions were made using a P value of ≤ 0.05.

The Ethics and Research Committee of EKSUTH gave approval for the study.

Results

A total of 9319 deliveries occurred during the six-year period out of which 270 were SB, giving a SB rate of 29 per 1000 deliveries. Table 1 summarizes the socio-demographic predictors of antepartum fetal death. It highlights the socio-demographic characteristics of the women who had SB, as well as the predictive factors. Their mean age was 29.38±5.2 years. Most of them, 105(38.9%), were within the ages of 26-30 years, only 16(5.9%) were less than 20 years. Barely a quarter of the women were booked while the rest, 208(77.0%) had no antenatal care. Forty five (16.7%) had no formal education, 140(51.8%) had either a primary or secondary education; 85(31.5%) were educated to tertiary level. Forty two (15.6%) had prior history of SB. Although 102(37.8%) were nullipara, 155(57.4%) have had one to four deliveries while 13(4.8%) were para ≥ 5.

Out of the 270 that had SB, 210(77.8%) were AFD making AFD rate to be 22.5 per 1000 births. As shown in table 1, a multiple regression analysis was run to predict AFD from maternal age, antenatal booking status, marital status, educational level, occupation, number of children alive, prior history of SB and religion. Overall, these variables statistically explain variance in AFD ($F_{8, 261}$= 2.809, R^2 = 0.079, P = 0.005) with antenatal booking status being a significant contributor (P ≤ 0.05).

Furthermore, all considered variables were entered into binary logistic regression model (Table 2) to consolidate statistical deductions. Among the variable subsets, the most prominent characteristics associated with AFD were maternal age ≤20years (93.8%), absence of antenatal care (83.2%), being single (92.3%), lack of formal education (95.6%), unskilled occupation (81.1%), parity ≥ 5 (92.3%), those with prior history of SB (81.0%) and Muslims (81.8%). In addition, the model demonstrated that absence of antenatal care (AOR: 3.32, 95% CI: 1.80-6.21, P<0.001) and lack of formal education (AOR: 0.18, 95% CI: 0.03-0.64, P= 0.005) were associated with AFD.

Table 1: Socio-demographic predictors of antepartum fetal death (P<0.05*).

Variable	n(%)	Unstandardized β coefficient	95% CI	P value
Maternal age (yrs)		0.036	-0.945 to .2.162	0.217
≤20	16(5.9)			
21-25	47(17.4)			
26-30	105(38.9)			
31-35	72(26.7)			
≥36	30(11.1)			
Antenatal booking		-0.184	-0.311 to -0.056	0.005*
Yes	62(23.0)			
No	208(77.0)			
Marital status		-0.099	-0.340 to 0.143	0.422
Single	13(4.8)			
Married	257(95.2)			
Educational level		0.018	-0.038 to 0.074	0.523
None	45(16.7)			
Primary	49(18.1)			
Secondary	91(33.7)			
Tertiary	85(31.5)			
Occupation		0.031	-0.056 to 0.118	0.482
Unskilled	169(62.9)			
Semi-skilled	83(30.7)			
Skilled	18(6.7)			
Number of children alive		-0.077	-0.190 to 0.037	0.184
0	102(37.8)			
1-4	155(57.4)			
≥5	13(4.8)			
Prior stillbirth		0.010	-0.136 to 0.156	0.890
Yes	42(15.6)			
No	228(84.4)			
Religion		-0.004	-0.186 to 0.176	0.969
Christianity	248(91.9)			
Islam	22(8.1)			

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Table 2: Binary logistic regression model.

Variable	Antepartum fetal demise, n(%)		95% CI	p value	Variable
	Yes	No			
Maternal age (yrs)					
≤20	15(93.8)	1(6.2)	0.38	0.04-2.00	0.328
21-25	37(78.7)	10(21.3)	1.10	0.47-2.50	0.857
26-30	84(80.0)	21(20.0)	1.00		
31-35	51(70.8)	21(29.2)	1.64	0.82-3.30	0.159
≥36	23(76.7)	7(23.3)	1.25	0.47-3.17	0.691
Antenatal booking					
Yes	37(59.7)	25(40.3)	1.00		
No	173(83.2)	35(16.8)	3.32	1.80-6.21	<0.001*
Marital status					
Single	12(92.3)	1(7.7)	0.40	0.04-2.03	0.196
Married	198(77.0)	59(23.0)	1.00		
Educational level					
None	43(95.6)	2(4.4)	0.18	0.03-0.64	0.005*
Primary	37(75.5)	12(24.5)	1.03	0.46-2.27	0.967
Secondary	69(75.8)	22(24.2)	1.00		
Tertiary	61(71.8)	24(28.2)	1.23	0.63-2.41	0.540
Occupation					
Unskilled	137(81.1)	32(18.9)	0.69	0.37-1.29	0.244
Semi-skilled	62(74.7)	21(25.3)	1.00		
Skilled	11(61.1)	7(38.9)	1.90	0.66-5.34	0.243
Number of children alive					
0	76(74.5)	26(25.5)	1.27	0.70-2.27	0.433
1-4	122(78.7)	33(21.3)	1.00		
≥5	12(92.3)	1(7.7)	0.44	0.04-2.27	0.241
Prior stillbirth					
Yes	34(81.0)	8(19.0)	0.83	0.35-1.81	0.590
No	176(77.2)	52(22.8)	1.00		
Religion					
Christianity	192(77.4)	56(22.6)	1.00		
Islam	18(81.8)	4(18.2)	0.83	0.25-2.29	0.634

*P<0.05

Discussion

Though the WHO has defined SB using criteria for international comparison, comparing absolute figures has remained a challenge because of the disparity in the cut-off values used by different authors. For example, in some countries SB has been defined based on births occurring ≥ 20 weeks of gestation, using the number of singleton deliveries only as the denominator or by using a minimum weight of 500grammes [11,12].

This study employed the WHO criteria for international comparison and found a SB rate of 29 per 1000 deliveries and an AFD rate of 22.5 per 1000 births. This is higher than the rate of 10.1 prenatal deaths per 1000 deliveries from a previous study in Saudi Arabia.[12] Since 63.1% of all births in Nigeria occur at home [13]. It is likely that pregnancies resulting in SB are more and are undocumented.

Absence of antenatal care contributed significantly to AFD in this study. This association is consistent with reports from the Middle East and in some developed nations [11,14,15]. Although regional variations exist in the reasons cited for poor or non-utilization of prenatal services, poverty, and difficult access to health facility and negative public perceptions of maternity care centres have topped the list in LMIC [16,17].

Antenatal care usually provides the care-givers the opportunity to identify warning signs and symptoms of impending fetal demise and/or control chronic medical conditions that could pose threat to fetal well-being [11,18]. Therefore intensive surveillance and timely delivery of some of the unbooked women in this study could have led to a reduction in the unacceptably high antenatal fetal death rate recorded.

Lack of formal education also significantly accounted for AFD. This was also noted by studies involving many developing and developed nations [19,20]. The link between fetal death and low/no education in the mother could involve interplay of multiple pathways. For instance, the lack of education of mothers could militate against their use of medical care. Studies have shown a significant association between women's level of education and the utilization of hospital services, including prenatal care [21-23].

In similar vein, having no formal education likely confines a woman to lowest rungs on the wealth quintile ladder. In the 2013 National Health Survey, 56% of all documented SB was accounted for by women in the lowest two wealth quintiles [13]. In addition, appreciation of subtle ill-health warning signals could be determined by the extent of enlightenment of an individual [23]. It is possible that those without formal education are likely to overlook symptoms of fetal compromise or are likely to present later when fetal demise might have occurred.

Though not statistically significant, other factors associated with fetal death prior to labour were maternal age ≤ 20 years, being single, unskilled occupation, previous history of SB, parity ≥ 5 and/or being a Muslim. A study of AFD in Saudi Arabia [12]. Observed that grand-multiparous women rarely access prenatal services as they feel over-confident about their knowledge of pregnancy. They instead devote time and energy to cater for their large families at the expense of the unborn child. Also, research has demonstrated that in the absence of antenatal care, teenagers are more likely to have unfavourable pregnancy outcome, including SB [24,25]. Thus, it is important that more attention be paid to educating these sets of women on the need to access antenatal care when pregnant.

This is the first study from Nigeria, the most populous African nation, to specifically consider demographic predictors of AFD and the observation made offers insight for focused intervention at reducing stillbirths in our environment post-2015. This would hopefully set the pace for further prospective multi-centre research that can identify feasible, low-cost interventions that could make a real impact on reducing the SB burden. It is recognized that being a retrospective study, extent of data gathering was limited, but it does not in any way invalidate the research findings.

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In conclusion, the identified socio-demographic variables contributing to AFD in our study appear largely modifiable and provide opportunities for reduction of SB. Attention should be paid to girl-child education and health promotion towards improving the utilization of antenatal services. Once these are addressed, a remarkable reduction in AFD is possible in LMIC settings.

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