

ORIGINAL ARTICLE

Stillbirths at the West Gonja hospital in northern Ghana

E.M. Der^{1,2}, F. Suta³, T.B. Azongo⁴ and C. Kubio³

¹Department of Pathology, School of Medicine and Health Sciences, ⁴Department of Nursing, School of Allied Health Sciences, University for Development studies, Tamale; ²Department of Pathology, Korle-Bu teaching Hospital, Accra; ³West Gonja Hospital, Damongo, Ghana

In most parts of Ghana, stillbirths (SBs) do not count in routine mortality data collection and therefore are not seen as a major public health problem. The aim of this study was to determine stillbirth rate, trend, causes and factors associated with stillbirth at the West Gonja Hospital in northern Ghana and offer recommendations. This study reviewed antenatal cards of mothers and records in the labour and maternity wards for cases of SBs from January 2009 to December 2013 for foetal and maternal characteristics. Data were entered and analyzed using SPSS software (version 18, Chicago). There were 3,641 births and 121 SBs during the study period with an average SBs rate of 33.2 per 1000 births. There was a gradual rise in the annual incidence of SBs from 2.9% in 2009 to 3.9% in 2012. Majority (55.4%) of the SBs were fresh. A total of 58 (47.9%) of the SBs had no identifiable cause. The mean gestational age of SBs was 34.8 weeks (SD=4.2), and the mean weight was 2.4 Kg (SD=0.8). Majority (73.9%) of the mothers were housewives. We found strong positive associations between SBs and maternal occupation ($p<0.00$), but negatives associations with maturity of pregnancy ($p=0.01$), mode of delivery ($p<0.00$), type of pregnancy ($p=0.04$) and the causes of stillbirths ($p<0.00$). This study found a high SBs rate of 33.2 per 1000 births, with a gradual rise in the incidence over the study period. Many of the SBs had no identifiable cause. Most of the mothers who had stillbirths were house wives and many of the cases had no identifiable causes. There is the need for improve SBs data collection and the need for further investigations on the causes of stillbirth in Ghana.

Journal of Medical and Biomedical Sciences (2016) 5(1), 1-7

Keywords: Mortality data, causes, incidence rate, parity, gestational week

INTRODUCTION

The World Health Organization (WHO) defined stillbirth (SB) as the death of a foetus before the complete expulsion or extraction from its mother at term, weighing at least 1,000g and occurring after 28 completed weeks of gestation or having at least 35 cm body length, which is indicated by the fact that after such a separation, the foetus does not show any evidence of life (WHO, 2004). In most parts of Ghana, stillbirths often go unrecorded, do not count in the health sector mortality data collection and are therefore not seen as a major public health problem in most reports in Ghana (GHS, 2009; GHS, 2010;

GSS, 2012).

The stillbirth rate, defined as the number of stillbirths per 1000 births, varies sharply by country, from lower rates such as 2 per 1,000 births to 2.2 per 1,000 in Finland, Singapore, Denmark and Norway, to high rates such as 42 per 1,000 in Nigeria to 47 per 1,000 in Pakistan (ChartsBin, 2011). Rates also vary widely within countries, with higher burden in the rural areas, where skilled birth attendants are not always available for essential care during childbirth such as obstetric emergencies, including caesarean sections (Di Mario *et al.*, 2007; Lawn *et al.*, 2011; Say *et al.*, 2006). The aim of this study was to estimate stillbirth rate, trend, causes and factors associated with stillbirth at the West Gonja Hospital in northern Ghana and offer recommendations that will reduce that rate and ensures that

Correspondence: Dr Der Muonir Edmund, Department of Pathology, School of Medicine and Health Sciences, University for Development Studies, Tamale, Ghana; E-mail: maadelle@yahoo.com

on stillbirths are part of the national mortality data.

MATERIALS AND METHODS

Study site and design

This was a retrospective study conducted at the West Gonja Hospital. Currently the hospital has a bed complement of One Hundred (100). It is the only hospital in the West Gonja district serving over 48,160 people living in approximately 103 communities (GSS, 2012). It serves as the first point of call for patients of the immediate catchment area and also as a referral centre for patients from the four sub-districts in the district. The West Gonja District is one of the 26 districts in the northern region of Ghana. The District is located completely in the savannah belt and the district capital, Damongo is about 130km west of Tamale. Majority of the people are farmers. The road network is partly tarred.

Data collection and analysis

The data for our study were derived from the record books in the labour and maternity wards as well as from the antenatal records of mothers, from January 2009 to December 2013. Data were collected on the age and occupation of mothers, community of residence, the number of antenatal visits, gestational age at delivery, mode of delivery, type of stillbirth, sex and birth weight of the baby, and other pregnancy details to ascertain the cause of death. In this study, the denominator was all births at the West Gonja District hospital covering the period of study. Data was analysed employing SPSS software to obtain descriptive statistics for the each variables of the study. Results were presented in tables, bar charts, pie charts and line graphs. Associations between stillbirth and maternal and foetal factors were determined using Spearman's correlation co-efficient.

RESULTS

Rate and trend of stillbirths

There were 3,641 births and 121 SBs at the West Gonja District Hospital, during the five year period of study (January 2009 to December 2013) with an average SB rate of 33.2 per 1,000 births. The average annual relative proportion of SBs over the study pe-

riod was 24.2 cases. There was generally a gradual rise in the number of deliveries and the relative proportions of SBs from 2.9% in 2009 to 3.9% in 2012, with a slight declined in 2013 (Table 1).

Table 1: Annual trend of deliveries and stillbirths at the West Gonja Hospital, 2009-2013

Year	Deliveries (y)	Stillbirths (x)	Stillbirth rate (x/y)/1000 live births
2009	589	17	2.9
2010	669	23	3.4
2011	684	24	3.5
2012	824	32	3.9
2013	875	25	2.9
Total	3,641	121	3.3

Demographic and perinatal characteristics of mothers who had SBs

The ages of mothers who had SBs ranged from 14 - 44 years, with a modal age group of 21-25 years (26.4%). Majority of the mothers were housewives (73.9%) (Table 2). There were 109 (90.1%) singletons and 12 (9.9%) multiple pregnancies that had SBs. A total of 114 (94.2%) out of the 121 mothers visited the antenatal care during pregnancy. Many (35.1%) of these women visited the clinic 4 - 6 times before labour (Table 2). A total of 87 (72.0%) of the mothers had anti-malaria prophylaxis during pregnancy, of whom 54.0% completed the course. (Table 2). The parity of mothers was available for 118 (97.5%) women of whom many (30.5%) were para-zero. The maturity of pregnancy ranged from 28 - 44 weeks with a mean gestational age of 34.8 (SD=4.2) weeks, the majority (35.7%) had maturity between 34-36 weeks. Eighty-five (70.2%) of the women had spontaneous vaginal delivery (SVD) (Table 2).

Characteristics of stillbirths at the West Gonja District Hospital

A total of 67 (55.4%) of the 121 SBs were fresh (Table 3). Many of the SBs were males (55.4%). Majority (95.9%) of the SBs had stated birth weights and this ranged from 0.7 to 4.1 Kg, with a mean weight of 2.4 Kg (SD=0.82). Fifty-seven

Table 2: Demographic, antenatal and delivery records of mothers who had stillbirths at the West Gonja Hospital, 2009-2013

Variables	Classification and distribution					
Age (years)	11 -15	16-20	21-25	26-30	31-35	≥36
N (%)	2(1.7)	13(10.7)	32(26.4)	30(24.8)	27(22.3)	17(14.1)
Occupation	House wife	Trader	Student	Seamstress	Teacher	Others
N (%)	96(76.0)	12(9.9)	7(5.8)	4(3.5)	3(2.5)	3(2.5)
ANC visits (mnt)	Not stated	1 – 3	4 – 6	≥7		
N (%)	21(18.4)	36(31.6)	40 (35.1)	17(14.9)		
Parity	Zero	Para-1	Para-2	Para-3	Para-4	Para-≥5
N (%)	36(30.5)	17(14.4)	16(13.6)	16(13.6)	14(11.9)	19(16.1)
Gestation (wks)	Not stated	28 - 32	33 – 36	37 - 40	≥41	
N (%)	4(3.6)	29(25.9)	40(35.7)	34(30.4)	5(4.5)	
Delivery	SVD	C/S	VA.E			
N (%)	85(70.2)	35(29.0)	1(0.8)			

KEY: SVD = Spontaneous vagina delivery, C/S = Caesarean section, VA = Vacuum extraction

(49.1%) of the babies had weights between 2.5–3.4 Kg Table 3. Five of the babies had no stated weights at the time of data collection. Many (47.9%) of the stillbirths had no identifiable cause. Of those with identifiable causes, 20 (16.5%) were due to antipartum haemorrhage (Table 3).

Association of Stillbirths with maternal and foetal factors

There was a strong positive association between SBs and maternal occupation ($p=0.00$). There was also strong negative associations between SB and maturity of pregnancy ($p= 0.01$), mode of delivery

($p=0.00$), type of pregnancy ($p=0.04$), and the causes of stillbirths ($p=0.00$) (Table 4). No significant association was found between stillbirth and ANC visits ($p=0.92$).

DISCUSSION

The current study found SB rate of 33.2 per 1,000 births at the West Gonja District Hospital in the northern region of Ghana. This value although from a single institution-based study at a district hospital, is much higher than population based rates in developed countries, such as 2 per 1,000

Table 3. Characteristics of stillbirths at the West Gonja Hospital, 2009-2013

Category of SBs	Classification and distribution								
Year	2009	2010	2011	2012	2013				
TSBs	17	23	24	32	25				
Number of FSBs	11	12	12	21	11				
Number of MSBS	5	11	12	11	14				
FSBs as a % of TSBs	64.7	52.2	50	63.6	44				
MSBs as a % of TSBs	35.3	47.8	50	34.4	56				
Birth weight (Kg)	<2.0	2.0–2.4	2.5–3.4	≥3.5					
n/%	26(22.4)	21(18.8)	57(49.1)	12(10.4)					
Causes of SB	Unknown	AH	Prem	Foetal dist	Malp	CPD	Cord P	Con	PIH
N (%)	58(47.9)	20(16.5)	10(8.3)	10(8.3)	9(6.6)	3(2.5)	5(4.1)	4(3.3)	2(1.7)

KEY: TSBs= Total stillbirths, FSBs= Fresh stillbirths, MSBs= Macerated stillbirths, AH antepartum haemorrhage, Prem = prematurity, Foetal dist = Foetal distress, Malp = Malpresentation, CPD = Cephalopelvic disproportion, CP = Cord prolapse, PIH = Pregnancy induced hypertension

Table 4: Foetal and maternal factors associated with the risk of stillbirths at the West Gonja Hospital, 2009-2013

Variable	Association with Stillbirth	
Maternal age (years)	R= 0.07,	p=0.44
Maternal occupation	R= 0.29,	p=0.00
ANC visits	R= -01,	p=0.92
Maturity of pregnancy	R= - 23,	p=0.01
Weight of baby	R= - 113,	p=22
Mode of delivery	R= - 30,	p=0.00
Causes of stillbirth	R= - 0.46,	p=0.00
Parity of mother	R= 0.09,	p=0.93
Type of pregnancy	R= - 0.19,	p=0.04
Sex of the baby	R= - 0.01,	p=0.88

births in Finland and Singapore ⁷ and 2.2 per 1000 births in Denmark and Norway.⁷ The current SB rate of 33 per 1,000 births is comparable with population based rates in some developing countries such as 34 per 1,000 births in Djibouti and Senegal, but lower than 36 per 1,000 in Bangladesh, 42 per 1,000 in Nigeria and 47 per 1,000 births in Pakistan.⁷ The high SB rates in our study in northern Ghana and other developing countries may be a reflection of lack of skilled birth attendants, unavailability of emergency, caesarean sections, as well as behavioural, socio-cultural and economic factors (Di Mario *et al.*, 2007; Lawn *et al.*, 2011; Say *et al.*, 2006).

Within Ghana the few data available show variation in SB rates across the country. In 2009, the national stillbirth rate as quoted by WHO and UNICEF was 22 per 1000 births (WHO *et al.*, 2012). In 2011, Engmann *et al.* (2012) found a rate of 23 per 1000 births in the Kasena Nankana District; Navrongo, in the Upper East region of Ghana. These values were much lower than our value of 33.2 per 1000 births. However, data from the Upper West and Central regions of Ghana found rates that ranged from 33.3 per 1000 births in Upper West region to 35 per 1000 births in the Central region (Edmond *et al.*, 2008a; Edmond *et al.*, 2008b; GHS, 2004). These rates are comparable to our value of 33.2 per 1000. The Northern, Upper West and Central regions are among the poverty endemic regions of Ghana. The West Gonja district is in the Northern region and

this may explain the similarities in these findings.

There was a gradual rise in the SB rate over the study period. This differs from downward trend of SB rates in most developed countries (Cousens *et al.*, 2011; NISRA, 2013; ONS, 2013a). The paucity of regional data on stillbirth rates in Ghana makes comparing trends very difficult. Within the same period of study (2010 – 2012), there was a decline in SB rates in the Central region of Ghana,(GHS, 2012) however trends in the Volta and Upper West regions were that of a rise (GHS, 2004; GHS, 2011), similar to the findings in this current study.

In this study, 55.4% of the stillbirths were fresh stillbirths (FSBs). This current finding differs from studies that found macerated stillbirth to be common type (Engmann *et al.*, 2012; Okeudo *et al.*, 2013) but similar to a study in Nigeria that found FSBs to be common category (Ezugwu *et al.*, 2011). Majority of the SBs were males, this differs from the study of Hadar *et al.* (2012) that found females to be commonly affected, but agreed with the study of Smith (2000) that found males to be commonly affected.

In this study, 47.9% of the stillbirths had no identifiable cause. This is similar to a study that found that large percentage causes of stillbirths remain unknown, even in cases where extensive testing and autopsy have been performed (Cacciatore, 2007). Also this large group of SBs without apparent cause, couple with the fact that majority of the deaths were fresh, most probably suggest that death occurred during the intrapartum period. This is in accord with studies in developing countries that found that majority of the unexplained stillbirths occurred in the intrapartum period (Bound *et al.*, 1956; Flenady *et al.*, 2009; Hey *et al.*, 1986; Lawn *et al.*, 2005; Wigglesworth, 1980).

However, a range of known causes were found in this study. These were; complications of childbirth, prematurity, abnormalities of the placenta, pregnancy induced hypertension, and congenital abnormalities. Although this is similar to studies elsewhere

(NISRA, 2013; ONS, 2013b; Schott *et al.*, 2007), it differs from the study that found prematurity to be the commonest cause of perinatal death (Anyebuno, 1996). Stillbirths were common with lower births weight, similar to findings in other studies (Anyebuno, 1996; Ezugwu *et al.*, 2011; Flenady *et al.*, 2011; Ray and Urquia, 2012).

The great majority of the mothers who had still births in this study were house wives. There was a strong positive association between SBs and maternal occupation ($p=0.00$). This finding may reflect the fact that West Gonja district is predominantly a farming community. There was also strong negative associations between SB and maturity of pregnancy ($p=0.01$), mode of delivery ($p=0.00$), type of pregnancy ($p=0.04$), and the causes of stillbirths ($p=0.00$).

This current study did not find strong associations with parity of the mothers. This finding differs from the study of Okeudo *et al.* (2013) which found primigravidae to be commonly associated with SBs. It was found that mothers with SBs were very young, majority within 21-25 years (26.4%). This agreed with a study that found young age at pregnancy to be a risk factor for SB (Okeudo *et al.*, 2013). In this current study, majority of the mothers attended ANC four or more times before birth and this is comparable to some studies in Canada that found ANC attendance of about 75% (Bartholomew, 2009; Maaten *et al.*, 2006). But, this current study did not find any significant association between ANC visits and stillbirths ($P=0.92$). This differs from a study in southeast Nigeria that found that women who did not received prenatal care had a significantly higher stillbirth rate ($p<0.05$) (Ezugwu *et al.*, 2011).

CONCLUSION

The study found stillbirth rate of 33.2 per 1000 births, with a gradual annual rise over the period. About half of the SBs had no identifiable cause. Although our findings may have underestimated the burden of stillbirths in the West Gonja district, it was an attempt to measure the numbers of babies dying during the last trimester of pregnancy. There is

the need for improve SBs data collection and the need for further investigations on the causes of stillbirth in Ghana.

ACKNOWLEDGEMENT

We acknowledged the staff of the labour and maternity wards of the West Gonja Hospital.

COMPETING INTERESTS

The authors declare that they have no competing interests.

REFERENCES

- Anyebuno M (1996). Perinatal mortality in Korle Bu Teaching Hospital, Accra. Ghana medical journal 30: 710-714.
- Bartholomew S (2009) *What Mothers Say: The Canadian Maternity Experiences Survey*. Public Health Agency of Canada.
- Bound J, Butler N, & Spector W (1956). Classification and Causes of Perinatal Mortality: Part II. Factors in Pregnancy and Labour Influencing Perinatal Mortality. Part III. Clinical Pictures in Babies Dying in the Neonatal Period. British medical journal 2: 1260.
- Cacciatore J (2007). A phenomenological exploration of stillbirth and the effects of ritualization on maternal anxiety and depression. *Current Worldwide Stillbirth rate (per 1000 births)*. [Online] [Accessed].
- Cousens S, Blencowe H, Stanton C, Chou D, Ahmed S, Steinhardt L, Creanga AA, Tunçalp Ö, Balsara ZP, & Gupta S (2011). National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. *The Lancet* 377: 1319-1330.
- Di Mario S, Say L, & Lincetto O (2007). Risk factors for stillbirth in developing countries: a systematic review of the literature. *Sexually transmitted diseases* 34: S11-S21.
- Edmond KM, Quigley MA, Zandoh C, Danso S, Hurt C, Agyei SO, & Kirkwood BR (2008a). Aetiology of stillbirths and neonatal deaths in rural Ghana: implications for health programming in developing coun-

- tries. Paediatric and perinatal epidemiology 22: 430-437.
- Edmond KM, Quigley MA, Zandoh C, Danso S, Hurt C, Agyei SO, & Kirkwood BR (2008b). Diagnostic accuracy of verbal autopsies in ascertaining the causes of stillbirths and neonatal deaths in rural Ghana. Paediatric and perinatal epidemiology 22: 417-429.
- Engmann C, Walega P, Aborigo RA, Adongo P, Moyer CA, Lavasani L, Williams J, Bose C, Binka F, & Hodgson A (2012). Stillbirths and early neonatal mortality in rural Northern Ghana. Tropical Medicine & International Health 17: 272-282.
- Ezugwu EC, Onah HE, Ezegwui HU, & Nnaji C (2011). Stillbirth rate at an emerging tertiary health institution in Enugu, southeast Nigeria. International Journal of Gynecology & Obstetrics 115: 164-166.
- Flenady V, Frøen FJ, Pinar H, Torabi R, Saastad E, Guyon G, Russell L, Charles A, Harrison C, & Chauke L (2009). An evaluation of classification systems for stillbirth. BMC pregnancy and childbirth 9: 1.
- Flenady V, Koopmans L, Middleton P, Frøen JF, Smith GC, Gibbons K, Coory M, Gordon A, Ellwood D, & McIntyre HD (2011). Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. The Lancet 377: 1331-1340.
- GHS (2004). Upper West Region annual report Ghana Health Service, p 39.
- GHS (2009). Ghana Independent Health Sector p3.
- GHS (2010). Ghana Health sector report Ghana Health Service, p 8.
- GHS (2011). Volta Region Annual Report Ghana Health Service, p 50.
- GHS (2012). Central Region annual report Ghana Health Service p46.
- GSS (2012). 2010 Population and Housing Census Ghana Statistical Service, p 101.
- Hadar E, Melamed N, Sharon-Weiner M, Hazan S, Rabinerson D, Glezerman M, & Yogev Y (2012). The association between stillbirth and fetal gender. The Journal of Maternal-Fetal & Neonatal Medicine 25: 158-161.
- Hey E, Lloyd D, & Wigglesworth J (1986). Classifying perinatal death: fetal and neonatal factors. BJOG: an international journal of obstetrics & gynaecology 93: 1213-1223.
- Lawn J, Shibuya K, & Stein C (2005). No cry at birth: global estimates of intrapartum stillbirths and intrapartum-related neonatal deaths. Bulletin of the World Health Organization 83: 409-417.
- Lawn JE, Blencowe H, Pattinson R, Cousens S, Kumar R, Ibiebele I, Gardosi J, Day LT, & Stanton C (2011). Stillbirths: Where? When? Why? How to make the data count? The Lancet 377: 1448-1463.
- Maaten S, Guttmann A, Kopp A, Handa M, & Jaakkimainen L (2006). Care of women during pregnancy and childbirth. Primary care in Ontario: ICES Atlas Toronto (ON): Institute for Clinical Evaluative Sciences.
- NISRA (2013). Registrar General annual report, 2011 Office for National Statistics: Belfast.
- Okeudo C, Ezem B, & Ojiji E (2013). Stillbirth Rate in a Teaching Hospital in South Eastern Nigeria: A Silent Tragedy. Annals of medical and health sciences research 2: 176-179.
- ONS (2013a). Characteristics of live birth 1, England and Wales 2012 Office for National Statistics.
- ONS (2013b). Death registration summary table, England and Wales 2012 Office for National Statistics.
- Ray J, & Urquia M (2012). Risk of stillbirth at extremes of birth weight between 20 to 41 weeks gestation. Journal of Perinatology 32: 829-836.
- Say L, Donner A, Gülmezoglu AM, Taljaard M, & Piaggio G (2006). The prevalence of stillbirths: a systematic review. Reprod Health 3: 4-12.
- Schott J, Henley A, & Kohner N (2007) *Pregnancy loss and the death of a baby: guidelines for professionals*. Bosun Press.
- Smith GC (2000). Sex, birth weight, and the risk of stillbirth in Scotland, 1980-1996. American journal of epidemiology 151: 614-619.

Stillbirths in Northern Ghana

Der et al.,

WHO (2004) *International statistical classification of diseases and related health problems*. vol. 1. World Health Organization.

WHO, UNICEF, & UNFPA (2012) *Trends in Maternal Mortality: 1990 to 2010: WHO, UNICEF,*

UNFPA, and The World Bank estimates. World Health Organization.

Wigglesworth JS (1980). Monitoring perinatal mortality: a pathophysiological approach. *The Lancet* 316: 684-686.

