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Factors Associated with Stillbirths at Mbarara Regional Referral Hospital

Elly Agaba MD[1] Julius MugishaMD[2] Christine Atuhairwe MPH[2] Prof. Yarine Farjando MD[2]
Joseph Ngonzi MD[3]
1.Mbarara University of Science and Technology, Mbarara, Uganda
2.International Health Sciences University, Institute of Health Policy and Management, Kampala, Uganda
Corresponding author details: P.O BOX 1410, Mbarara

ABSTRACT
Background: Still births contribute more than half 39(65%) to perinatal deaths but can be minimized if pregnancy is adequately monitored during antenatal care and adequate intrapartum care is given. Perinatal mortality is a key outcome indicator for obstetric care, preventable through EMOC and routine antenatal care of a pregnant woman that allows early detection, prompt diagnosis and early treatment of any pregnancy related conditions that improve perinatal outcome. Thus the objective of this study was to determine factors associated with still births among women at Mbarara Regional Referral Hospital in Mbarara District.**Methods:** An unmatched case control study was adopted. A total of 300 mothers who delivered at or above 28 weeks between august and December 2013 were interviewed using administered questionnaires. Data was analyzed using STATA.**Results**: We found that 102(34%) mothers had stillbirths and 198(66%) had live births. The mean age (in complete years) of mothers that had live births (25.1±5.45) and those that experienced a stillbirth (25.8±5.89). Mothers in the 30-45 age bracket experienced high 32(31.7%) stillbirth frequency, contrary to younger mothers in the 25-29 age bracket that had the lowest 19(18.8%) stillbirth frequency Therefore, the key determinants of stillbirths at Mbarara Regional Referral Hospital were: obstetric and health systems factors that include (cOR, 95%) inadequate antenatal care: ≤ 3 visits (2.10, 1.12-4.0, P= 0.0312) cord prolapsed (5.8, 1.50-4.28, P=0.012), referral status (3.4, 1.74-6.74, P=0.000), lack of partogram use (6.44, 2.3-7.90, P=0.000) and antenatal booking health facility II (3.9, 1.36-11.26 P=0.000) and anemia (2.75 1.60-6.50 P=0.0213 was the medical factor found to be associated with stillbirth.**Conclusions:** To significantly lower stillbirth rates at MRRH, there is need to strengthen goal oriented antenatal care so as to identify and address the aforementioned factors during antenatal visits and delivery.
Key words: Stillbirth, Case, Control, Fresh stillbirth (intrapartum stillbirth), Macerated stillbirth (ante partum stillbirth) and Perinatal

Introduction

Globally, at least 7300 still births occur every day with majority (98%) of cases occurring in Sub-Saharan African countries including Uganda whose still birth rate is as high as 25 per 1000 births and perinatal mortality of 40/1000live births. Although there is a global decline in the stillbirth rate by just 1.1% per year over the last two decade (ISA, 2009; WHO, 2009) in Africa, perinatal mortality still stands at 62 per 1000 live births compared to 10 per 1000 live birth in developed countries (Matijasevich, 2009). Still birth rates may be as high as 30–40 per 1 000 births in low-income countries, especially areas of Sub-Saharan Africa and South Asia, while rates as low as 3–4 per 1 000 are reported in many high-income countries (Elizabeth *et al*., 2007). Uganda that has a high estimated stillbirth rate of 25/1,000 births, Kenya 22, Tanzania 26, Rwanda 23, Burundi 28 (UNFPA Report, 2011). McClure (2011) argues that the knowledge of stillbirth numbers and their perceived causes as well as feasible solutions, are key to designing effective policies and programmes for their prevention (Pattinson *et al*., 2011).

A study done in Uganda to determine risk factors for perinatal mortality showed that nearly half of perinatal deaths 27 (45%) were fresh stillbirths while 12 (20%) were macerated stillbirths and 33.3% babies who were born alive died within 24 hours (Akello, 2008).This shows that stillbirths contributes more than half 39(65%) to perinatal deaths, can be minimized if pregnancy is adequately monitored during antenatal care and adequate intrapartum care is given. Thus high perinatal death that reflects the quality of health care services given to new born care multi factorial in etiology (MOH, 2011) It is also a proxy measure of the maternal health status and mortality significantly influenced by the quality of health care of a population. And yet many still births cases are not documented as major public health problem, yet it is a heartbreaking loss for women and families (McClure *et al*., 2011).

The high still birth rate is Uganda is attributable to poor baseline maternal health due to poor treatment outcome of medical diseases, poor prevention and treatment of maternal conditions. More so, the apparent risk factors for unexplained stillbirth include: advanced maternal age, multiple gestations; short birth interval usually causes chronic maternal anemia, herbal medicine, domestic violence, hypertension, diabetes, malaria, previous abortion and abruption placenta (Fretts, 2005; Silver et al., 2007). If the perceived risk of a stillbirth is

investigated and appropriate measures taken this will improve the outcome of subsequent pregnancies .A third of the perinatal causes are identifiable at the first antenatal visit from the past obstetric history and medical examination; one third develop during pregnancy and another one third arise during labor resulting in stillbirth (Baskett, 1999).

Review of records in the Mbarara Regional Referral Hospital (MRRH) from January to May 2012 revealed a high proportion of stillbirths' ~50/1000 live births (MRRH records, 2012). This is high, and yet no specific study has been carried out to determine the current stillbirth rate and associated factors. The south-western region of Uganda, where Mbarara Hospital is located, has the highest perinatal mortality rate of 54 per 1000 births compared to national average of 40/1000births (UDHS, 2011). The situation is further complicated by inadequate reporting of stillbirths and early neonatal deaths, which remains a problem (UDHS, 2011).

Methods and materials

Setting

The category of respondents was chosen women who delivered at MRRH Maternity ward during the study period and met the inclusion criteria for the study

Design and sampling procedures

This unmatched case-control study was conducted among mothers of Mbarara Regional Referral Hospital (MRRH) between August and December 2013 by using quantitative methods.

Data collection and management

Data was captured using a survey questionnaire. The tool was translated into local language (runyakole) and piloted by university medical students and research assistants who had been given basic training prior to the study.

Outcomes and exposure variables

The main outcome measure was stillbirths. Exposure variables include: Demographic (age, sex, marital status, educational level, employment); obstetric factors (gravidity, parity, DA, ANC & APH), maternal medical condition (DM, HT, Malaria & aneamia), health care system factors (use of a partograph, referral status).

Sample size estimation

The sample size was estimated using Kelsey formulae (1996) (Methods in Observational Epidemiology 2nd Edition) with a ratio of 1:2 case : control, ±0.05 precision, 5% estimated stillbirth rate, with 57% exposure among cases in rural setting and 95% confidence interval. This yielded 300 respondents (102 cases and 198 controls)

Ethical considerations

The study was approved by Mbarara Regional Referral Hospital and the department of obstetrics and gynecology, Mbarara University of science and technology research ethics committee.

Results

The study revealed that babies born alive were 202(66%) while stillborn babies were 104(34%); Ante partum stillbirths were 54(52%) and intrapartum stillbirths 50(48%), there was no much difference between ante partum/macerated and intrapartum/fresh stillbirth rate. In this study 50.5% mothers had stillbirths had less than four antenatal visits, 74.3% who had still births didn't have routine investigations done during antenatal, more than 50% had ANC booking at Health centre III and II where investigations and blood pressure are rarely done this would explain ante partum stillbirths of 52% since we know that it is through ANC that risk factors associated with stillbirths will be identified. Intrapartum/fresh stillbirths of 48% was associated with poor labor monitoring as evidenced by failure to use partograms and CTG, among cases only 4.9% had complete partographs and only 1% used CTG. Cordprolapse and late referral were factors associated with stillbirths.

Intrapartum fresh stillbirths contributed 48% to total stillbirths, which is comparable to the 45% intrapartum stillbirth reported by Akello (2008) in a similar study conducted in Arua Hospital, in Northern Uganda. Similarly Aklilu and colleagues (2009) reported 47.1% antepartum stillbirth and 52.9% intrapartum stillbirths in prospective study on stillbirths and early neonatal deaths conducted in Malawi ,which is in agreement with our study findings. However this proportion is lower compared to 72.2% intrapartum stillbirth that was reported by Were (1994) in Eldoret Hospital, Kenya. Probably it has changed and Health services have improved since it was more than 10years ago. Intrapartum stillbirths is an indicator of level of obstetric care provided, Nonetheless, the health facility has much control on intrapartum stillbirths and can be reduced through strengthening emergency obstetric care.

It was observed there was no significant association between maternal age and stillbirth however 30-45 age-group showed increased risk for stillbirths. Study results presented in table 1 indicate that among Cases, 64.7% resided in rural areas compared to 35.3% among Controls. A significant relationship between area of residence and stillbirths (p-value 0.0052). Women with primary education were 2.18 more likely to have stillbirths compared to those with no formal education and those with secondary education. It was revealed in the study that respondents having a UTI (p-value 0.003) and Anemia (p-value 0.0213) more likely to have stillbirths

than those who did not. Among the respondents with syphilis were 3.03 times more likely to have a stillbirth. Other medical conditions like Cardiac disease, hypertension, diabetes mellitus and malaria had no significant effect on perinatal outcome.

Table 1: *S*ocio-demographic factors associated with stillbirths

Variable	Controls(live births)	Cases(Stillbirths)	P-Value
Mean age in years, (SD)	25.1 (5.45)	25.8 (5.89)	0.2968
Age Group			0.063
<21 years	47 (23.9)	27 (26.7)	
21-24 years	55(27.9)	23(22.8)	
25-29 years	56(28.4)	19(18.8)	
30-45 years	39(19.8)	32(31.7)	
Mean distance from MRRH in km, (SD)	(19.9)1.5	(31.9)3.0	0.0001*
District			0.004*
Mbarara	137(69.2)	55(53.9)	
Isingiro	33(16.7)	34(33.3)	
Others	28(14.1)	13(12.8)	
Residence Setting			0.053
Rural	105(53.0)	66(64.7)	
Urban	93(47.0)	36(35.3)	
Marital status			0.359
Married	186(93.9)	94(92.3)	
Not married	12(6.1)	8(7.8)	
Level of Education			0.011
No formal	7(3.5)	12(11.8)	
Primary	109(55.1)	62(60.8)	
Secondary	59(29.8)	22(21.6)	
Tertiary	23(11.6)	6(5.9)	
Occupation			0.001*
Self employed	50(25.3)	12(11.8)	
Professional	21(10.6)	4(3.9)	
Peasant	123(62.1)	86(84.3)	
Others	4(2.0)	0(0.0)	
Income			0.001*
<50,000=	70(37.0)	58(58.0)	
>50,000=	119(63.0)	42(42.0)	
Referral status			0.000*
Referral	172(87.3)	67(66.3)	
None referral	25(12.7)	34(33.7)	
Financial support			0.444
Yes	179(95.7)	88(94.6)	
No	8(4.3)	5(5.4)	

Level of significance,* p-value< 0.05

Maternal risk factors among cases and controls

The study findings in the table above revealed that Gravidity (p-value 0.022<0.05);Parity (p-value 0.000< 0.05), gestation age(p-value 0.000< 0.05) antenatal care attendance (visits) (p-value 0.011< 0.05), ANC booking Health facility(p-value 0.004<0.05), failure to do routine investigations during ANC (p-value 0.001<0.05) and smoking during pregnancy (p-value 0.018< 0.05) were found to be significantly associated with a respondent poor birth outcome.

It was observed that inter pregnancy interval, pregnancy status -singleton or multiple, and alcohol use were not significantly associated with stillbirths.

Table 2: Maternal factors associated with stillbirths

Variable	Controls(live births)	Cases(Stillbirths)	p-value
Gravidity			0.022*
1	59(29.8)	32(31.4)	
3	56(28.3)	18(17.7)	
4	53(26.8)	23(22.6)	
5 or more	30(15.2)	29(28.4)	
Parity			0.000*
1	61(45.1)	13(20.0)	
2-3	48(35.6)	25(38.5)	
>4	26(19.3)	27(41.5)	
Gestation age in weeks			0.000*
<37 weeks	12(8.8)	22(29.3)	
37-40 weeks	84(61.8)	40(53.3)	
>40 weeks	40(29.4)	13(17.3)	
Pregnancy Interval in years			0.735
1 year	16(11.4)	10(14.7)	
2 years	45(32.1)	26(38.2)	
3 years	38(27.1)	17(25.0)	
4 years	14(10.0)	6(8.8)	
5 or More years	27(19.3)	9(13.2)	
Pregnancy status			0.981
Singleton	194(98.0)	99(98.0)	
Multiple	4(2.0)	2(2.0)	
Antenatal Care Visits			0.0113*
1-3	62(32.5)	51(50.5)	
4	80(41.9)	31(30.7)	
5 or More	49(25.7)	19(18.8)	
Booking			0.668*
Booked	194(98.0)	100(98.0)	
Not booked	4(2.0)	2(2.0)	
Booking Place			0.004*
Hospital	65(33.0)	16(15.6)	
Health centre III	40(20.3)	21(20.6)	
Health centre IV	79(40.1)	50(49.0)	
Others	13(6.6)	15(14.7)	
Routine Test			
Blood group done			0.001*
Yes	21(10.6)	26(25.7)	
No	177(89.4)	75(74.3)	
Smoking			0.018*
Yes	4(2.0)	8(7.9)	
No	194(98.0)	93(92.1)	
Alcohol use			0.754
Yes	12(6.1)	7(7.0)	
No	186(93.9)	93(93.0)	

Level of significance,* p-value< 0.05

The analysis between obstetric factors in relation with pregnancy outcome is presented in table 2 and

the probability value (p-value<0.05) was used to establish statistical significance between the study variables. It was observed that ruptured uterus (p-value 0.001< 0.05); obstructed labour (p-value 0.001< 0.05); Cord prolapse (p-value 0.006<0.05); premature labour (p-value 0.001< 0.000) APH (p-value 0.018< 0.05), febrile illness (p-value 0.002<0.05) and foetal distress (p-value 0.005< 0.05) were significantly associated with stillbirths.

The use of traditional herbs to quicken the child delivery was found to be statistically significantly linked to stillbirths (p-value 0.03< 0.05) 93.1% of the still births could be attributed to a mother using herbs to quicken the process of child delivery compared to 6.9% that were not due to herbs. It was observed that pre eclampsia/eclampsia, prolonged labour, birth weight and mode of delivery were not significantly associated with stillbirths.

Obstetric risk factors of still births

A cross tabulation analysis between obstetric factors in relation with pregnancy outcome is presented in table 3 and the probability value (p-value < 0.05) was used to establish statistical significance between the study variables. It was observed that ruptured uterus (p-value 0.001< 0.05); obstructed labour (p-value 0.001< 0.05); Cord prolapse (p-value 0.006< 0.05); premature labour (p-value 0.001< 0.05) APH (p-value 0.018< 0.05), febrile illness (p-value 0.002< 0.05) and foetal distress (p-value 0.005< 0.05) were significantly associated with stillbirths.

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Table 3: Obstetric factors associated with stillbirths

Variable	Controls(live births)	Cases(Stillbirths)	P-value
Pre eclampsia			**0.435**
No	188(97.9)	94(96.9)	
Yes	4(2.1)	3(3.1)	
Eclampsia			0.568
No	123(97.6)	65(97.0)	
Yes	3(2.4)	2(3.0)	
Ruptured uterus			0.001*
No	124(97.6)	58(84.1)	
Yes	3(2.4)	11(15.9)	
Obstructed labour			0.001*
No	183(92.9)	80(78.4)	
Yes	14(7.1)	22(21.6)	
Cord prolapse			0.006*
No	194(98.0)	93(91.2)	
Yes	4(2.0)	9(8.8)	
Premature labour			0.000*
No	192(97.0)	83(82.2)	
Yes	6(3.0)	18(17.8)	
Post term			0.153
No	191((96.5)	94(93.1)	
Yes	7(3.5)	7(6.9)	
APH			0.018*
No	194(98.0)	93(92.1)	
Yes	4(2.0)	8(7.9)	
Prolonged labour			0.301
No	177(89.4)	93(92.1)	
Yes	21(10.6)	8(7.9)	

Febrile illness			0.002*
No	192(98.0)	89(89.0)	
Yes	4(2.0)	11(11.0)	
Foetal distress			0.005*
No	190(96.0)	88(87.1)	
Yes	8(4.0)	13(12.9)	
Partogram use			0.000*
Not used	106(54.1)	84(82.4)	
Used not complete /not beneficial	42(21.4)	12(11.8)	
Used CTG	0(0.0)	1(1.0)	
Used & beneficial	48(24.5)	5(4.9)	
Use of Herbs during labour			0.03*
Yes	167(84.3)	95(93.1)	
No	31(15.3)	7(6.9)	
Health worker at point of delivery			0.035*
Specialist	1(1.0)	2(2.0)	
SHO	89(45.2)	61(59.8)	
Intern doctor	11(5.6)	7(6.9)	
Medical student	16(8.1)	7(6.9)	
Mid wife	80(40.6)	25(24.5)	
Mode of delivery			0.07
SVD	110(55.6)	53(52.0)	
CS	87(43.9)	44(43.1)	
Breech delivery	1(0.5)	3(2.9)	
Vacuum extraction	0(0.0)	2(2.0)	
Sex of the baby			0.072
Male	118(59.6)	51(50.0)	
Female	80(40.4)	51(50.0)	
Birth weight in kg			0.000*
<2.5Kg	10(5.1)	25(24.5)	
2.5-3.9 Kg	139(70.2)	52(51.0)	
≥ 4 Kg	49(24.8)	25(24.5)	

Level of significance,* p-value< 0.05

Maternal medical condition associated with stillbirths

When the respondents' medical factors were analyzed it was established that only anemia (p-value 0.018< 0.05) was found to be significantly associated with stillbirth outcome.

Table 4 Maternal medical condition associated with stillbirths

Variable	Live births (controls)	Stillbirths(cases)	P-Value
Diabetes Mellitus			0.668
No	192(98.0)	100(98.0)	
Yes	4(2.0)	2(2.0)	
Hypertension			0.775
No	195(98.5)	100(98.0)	
Yes	3(1.5)	2(2.0)	
Cardiac disease			0.505
No	194(98.0)	101(99.0)	
Yes	4(2.0)	1(1.0)	
Malaria			0.373
No	169(85.4)	83(81.3)	
Yes	29(14.7)	19(18.6)	
HIV			0.247*
Sero Negative	181(91.4)	90(88.2)	
Sero positive(stage 3)	17(8.6)	12(11.8)	
ART			0.178*
Yes	13(100)	8(80.0)	
No	0(0.0)	2(20.0)	
Anaemia			0.018*
No	188(95.0)	89(87.3)	
Yes	10(5.0)	13(12.7)	
Rh D			0.440*
Negative	4(2.0)	3(3.0)	
Positive	194(98.0)	98(97.0)	
Syphilis			0.080*
Yes	4(2.0)	6(5.9)	
No	194(98.0)	96(94.1)	

Level of significance,* p-value< 0.05

In order to determine factors associated with stillbirths at Mbarara regional Referral Hospital, a Binary Logistic Regression Model was fitted and results presented in table below. At multivariate analysis the following factors were found to be significantly associated with stillbirth at MRRH Antenatal care; less than four numbers of visits, ANC booking at lower health facility, referral, cord-prolapse and lack of partograph use. Antenatal Visits of 4 and above was found to be protective to poor perinatal outcomes (stillbirths)

Table 5 Multivariate analysis of factors associated stillbirths at MRRH

Variable	OR [95% Confidence Intervals]	P-Value
Antenatal care: Visits		0.0312
<4	2.10 [CI 1.12-4.0]	
≥ 4	0.98 [CI 1.5-3.5]	
ANC booking place		0.000
Health Centre IV	1.7 [CI 1.7-4.1]	
Health Centre III	1.9 [CI 1.9-4.0]	
Maternity centre/clinic	3.9 [CI 4.2-11.3]	
Referral status		0.000
Referral	3.4 [CI 1.74-6.74]	0.012
Cord prolapse	5.8 [CI 1.5-4.28]	
Partogram use		0.000
None use	6.44 [CI 2.3-7.90]	
Used but incomplete	2.1 [CI 1.6-6.90]	

Women who had less than 4 antenatal care visits during pregnancy were 2.10 more likely to have stillbirths compared to those who had more than four visits. It was revealed in the study that the place booked for ANC during pregnancy was positively associated with still births. Of those who booked at Health centre IV were 1.7, Health centre III were 1.9 and maternity clinics were 3.9 more likely to have stillbirths than those who did not. Among the respondents who had been referred from other health care facilities to Mbarara hospital were 3.4 times more likely to have a stillbirth compared to those that came for regular checkups.

Other medical conditions like Cord prolapse had a significant effect on perinatal outcome. Among the respondents who had cord prolapse at Mbarara regional referral hospital were 5.8 times more likely to have a stillbirth compared to those that did not. With regard to partogram use, the respondents that had not used were 6.44 more likely at Mbarara regional referral hospital were 5.8 times more likely to have a stillbirth compared to those that had not used it completely.

Discussion

Socio-demographic factors associated with stillbirths

We found that education status of respondent was significantly associated with stillbirth (p-value 0.011). Of the women who had stillbirths, the majority (60.8%) had attained primary education, and about 1 in every 10 women had no formal education. These findings are comparable to those reported by the UDHS (2011) where 74.5% of women that had stillbirth had attained primary education and only about 10.3% had had no formal education. Thus, the level of education of the respondent greatly influences her ability to have better nutrition and increases her access and utilization of primary health care/health services (UDHS, 2011).

The district of origin and whether or not a respondent was rural or urban based was found to be significantly associated with a respondent birth outcome. 53.9% of the cases were from Mbarara district, 33.3% Isingiro as compared to 12.8% were other districts. Furthermore, 64.7% of the cases (stillbirths) were of women that resided in rural areas compared to 35.3% (stillbirths) in urban areas. The district of origin of the respondents were found to be statistical significantly associated with still births at Mbarara Regional Referral Hospital (0.004 and 0.053<0.05 respectively) however on multivariate analysis it was not significant. This was affirmed in UDHS, 2011, where 10.3% of women who had stillbirths were from urban and 89.7% women from rural areas.

Lastly, we found that the occupation status, income and the fact that the respondent was referred to Mbarara regional referral hospital influenced the pregnancy outcome. The results revealed that among the women that had stillbirths 11.8% were self-employed, 3.9% were in formal employment and 84.3% were peasants mainly depending on cattle keeping and subsistence farming. 58% of the stillbirths occurred among women that had an income of less than 50,000 UG Shs. compared to 42% among those with an income greater than 50,000 UG Shs. 66.3% of the total stillbirths occurred among the respondents that had been referred Mbarara Regional Referral Hospital compared to 33.7% who were not referred. Occupation status (p-value 0.001< 0.05), income level of the respondent (p-value 0.001<0.05) and a respondent being referred (p-value 0.000<0.05) were found to be statistical significantly associated with the respondent having alive or stillbirth. However marital status was not significantly associated stillbirths.

There was study revealed no relation between marital status with stillbirths, as opposed to findings by Mugisha (2008) where single motherhood was significantly associated with fresh stillbirths. The UDHS (2011) affirmed that factors such as age, social economic status, maternal and paternal illiteracy, level of education, marital status, parity and occupation of the mother influenced pregnancy outcome. They affect health seeking behavior like antenatal clinic attendances where risk factors like contracted pelvis are assessed and appropriate referral is made. Teenage pregnancy, rural residence, and lack of formal education, attaining primary education,

were associated with high numbers of stillbirths in a similar study conducted in Arua Hospital, Uganda (Akello, 2008). However we observed that place of residence of a mother (rural or urban) was not statistically significantly associated stillbirths (p<0.053), yet proximity to a health care facility determines its access and utilization (UDHS, 2011). This defers from UDHS (2011) where the majority (89.3%) of stillbirths were by women from rural areas compared to a minority (11.7%) of stillbirths from urban areas.

Obstetric factors associated with stillbirth

We found that the following obstetric factors significantly increase the risk of stillbirths among women attending Mbarara Regional Referral Hospital: Women that had ruptured uterus were found to be significantly associated with stillbirth occurrence (OR 7.84, p-value 0.001) obstructed labor was found to be significantly associated with stillbirths (p-value 0.001), Cord prolapse was found to be significantly associated with having a stillbirth (p-value 0.006) this may be because it is an emergency which need quick intervention like caesarean section however theatre is about 400meters from labor ward which may hinder certain maneuvers to reduce cord compression and increases decision to delivery time hence poor perinatal outcome. Premature labor (p-value 0.000) was associated with stillbirths; mothers who had ruptured uterus were referrals from lower health units and no communication mechanism in place between lower health units and MRRH.

Kliman confirmed that the foetus can cause foetal cord accidents like prolapse, nuchal cord, and cord constriction, cord knots which may occur during labor leading to foetal distress and consequently fetal deaths (Kliman, 1999; Bawakanya, 2006). Furthermore, antepartum haemorrage (APH) was found to be associated with the risk of stillbirth at MRRH (p-value 0.018); similar findings were reported in the UK (CEDI, 1999) where APH was found to be among commonest causes of stillbirths.

The use of herbs to quicken the child delivery was found to be statistically significantly linked to stillbirths (p-value 0.03< 0.05) 93.1% of the still births could be attributed to a mother using herbs to quicken the process of child delivery compared to 6.9% that were not due to herbs. It was observed that pre-eclampsia/eclampsia, prolonged labor and birth weight were not statistically significantly associated with stillbirths

Feto-Maternal Factors associated with still births

Gestational age (≤37WOA ,≥42) and lower birth weight (≤2.5kgs) were found to be significantly associated with stillbirths p-value 0.00004 and 0.000 respectively. This is because of prematurity and associated complications which is challenge in limited resource settings and placental insufficiency associated with post term pregnancy this is comparable to the study done by Shingairai Feresu at Harare maternity Hospital Zimbabwe on incidence of stillbirths, perinatal deaths and associated factors found that gestational age of ≤28WOA, ≥40WOA, was associated with increased risk of stillbirths (Feresu, 2005)

Sex of the baby, male or female was found not be significantly associated with stillbirths, which differ from findings reported in studies that female babies generally have better perinatal outcomes despite having lower birth weights than their male counterparts (Copper et al.,1993).

Other obstetric factors found to be significantly associated with having stillbirths were foetal distress (p-value 0.005), lack of partogram use (p-value 0.000), febrile illness (p-value 0.002) This is because if partogram is not used certain conditions like foetal distress, prolonged labor and poor progress of labor will not be recognized will lead to poor perinatal outcomes. We found out that the respondent's parity (p-value 0.023) and gravidity (p-value 0.0003) were significantly associated with stillbirths at Mbarara Regional Referral Hospital. In this study long inter-pregnancy interval was not significantly associated with stillbirths this differs from findings reported by Aliya et al., 2005, where it was associated with stillbirths

Maternal medical factors associated with stillbirths

It was also found out during the study that mothers who experienced anemia stood a more significant risk of having a stillbirth than those that did not experience anemia (p-value 0.018).This compares to findings reported in a study in Tanzania showed that 63% of stillbirths were attributable to maternal anemia (Changalucha *et al*., 2007). Other medical conditions like malaria, hypertension, diabetes and maternal HIV were not significantly associated with stillbirths in this study however they have been reported in other studies to associated with poor perinatal outcome (Mutabingwa *et al*., 2006; Spellacy, 1994; Lionel et al., 2008)

Health system associated factors influencing stillbirths

Seeking ANC services for either routine monitoring of mother and foetus or any other reason other than routine monitoring was found to be associated with reduced risk of stillbirths than not seeking ANC services for treatment of various infections/complications. Among the health facility factors such as the number of antenatal visits made during pregnancy was found to be significantly associated with stillbirths OR 2.1(95% CI 1.1-4.0, p-value 0.0312).

The Health facility of choice of an expectant mother to attend ANC was also found to be significantly associated with stillbirths in Mbarara Regional Referral Hospital (p-value 0.000); at multivariate, booking at maternity centre/health centre II the Odds of delivering stillbirths was 3.92 times with p-0.011 compared to those who booked at Hospital, this because at Health centre II mothers are attended to by nursing

assistants/nurses whose skills for detecting risks/complications is not sufficient, even blood pressure is not taken and there is investigative capacity as compared to Hospital which has enough investigative capacity and well trained health workers including doctors to attend to these mothers. Therefore ANC remains a pillar in reducing stillbirth.

Regular antenatal care is helpful in identifying and preventing adverse pregnancy outcomes when it is sought early in the pregnancy and is continued through delivery. In line with the WHO guidelines, the Ministry of Health (MOH) recommends that a woman have at least four ANC visits, the first of which should be made in the first trimester. However it is possible, that during these visits health problems associated with pregnancy are detected. In the event of any complications, more frequent visits are advised, and admission to a health facility may be necessary, however 97% of mothers attend ANC care 88% attended to by a nurse/midwife and only 12% by a doctor the content of antenatal care is inadequate (UDHS, 2011).

Failure to use partogram was highly significantly associated with still births, Odds was 6.4times to deliver stillbirth with (p-value 0.00); compared to those who had completed use of partogram. Partogram use was very poor, only 53(29.4%) out of 300mothers had partogram used and were beneficial, the use of a partogram has been found to improve outcome of labor (WHO/FHE/MSM/93.8). This is because certain conditions like foetal distress, poor labor progress, prolonged, and obstructed labor, may be missed which may associated with poor pregnancy outcome. Use of partogram reduce intrapartum stillbirth from 0.5% to 0.3%, prolonged labor from 6.4% to 3.4%, labor augmentation with oxytocin 20.7% to 9.1% caesarean section from 6.2% to 4.5%, all these improve perinatal outcome according to WHO, 1994 partograph in management of labor.

There was evidence that the cadre of the health worker who conducted the delivery had strong association with perinatal outcome (p-value 0.0459). This is because doctors attend to all mothers with complications like ruptured uterus, APH-abruptio placenta, obstructed labor, foetal distress which are associated with poor perinatal outcome, leaving normal deliveries for midwives and nurses. This compares well with the CESDI report of 1995 which showed that both hospital midwives and doctors perform badly when the type of personnel to contributing to some optimal care examined.

Referral status, referred mothers had 3.4times of delivering stillbirth with (p-value 0.000) compared to those were not referred this was highly significantly associated with stillbirth even at multivariate analysis. Delay in referral from peripheral health units this contributed to poor labor outcome, most referral were late with complications coupled with long distances, poor terrine/bad roads meant at mothers arrived at MRRH with little chance to save the lives of babies, late recognition of complications at the referring units could have caused further delays for mothers to access appropriate obstetric care.

It is known that high quality delivery care needs at least 3key elements: skilled care at birth, emergency obstetric care in case of complications and a functioning referral system which ensures access to emergency obstetric care if needed (WHO, 2005).Some referral units had blood products or power shortage or personnel needed at the critical point when a mother needed this emergency obstetric care, ambulances were not always available at the time of referral.

Good quality intra-partum care provision needs staff in adequate numbers, with adequate supplies and should be linked with an efficient referral system. Emergency caesarean section done for obstructed labor among the cases had poor outcome, of the referrals 14 had ruptured uteri with 78.6% stillbirths and MRRH being referral unit received late referral with labor complications with little to do to save the lives of babies.

Similar findings have been reported in different studies the study done by Shingairai Feresu at Harare maternity Hospital Zimbabwe on incidence of stillbirths, perinatal deaths and associated factors found that poor antenatal care was significantly associated with stillbirths (Feresu, 2005). A Study done by WHO 1994 on partograph use was found to improve labor out and reduce intrapartum foetal deaths from 0.5% to 0.3%, and prolonged from 6.4% to 3.4% (WHO/FHE/MSM, 93.8); failure to use is associated with intrapartum stillbirths. These findings are in agreement without study findings.

Conclusion

Stillbirth rates at MRRH can be lowered by strengthening goal oriented antenatal care to identify and address the aforementioned factors during antenatal visits and delivery. Intra-partum stillbirths can be reduced by strengthening emergency obstetric care, by mainly using partograph and CTG to support and detect early recognition of poorly progressing labor and intra uterine foetal compromise. Early referral, and supervision and adherence to all routine investigations will support obstetric care. Nevertheless, perinatal mortality is preventable through EMOC and routine antenatal care of a pregnant woman that allows early detection, prompt diagnosis and early treatment of any pregnancy related conditions that improve perinatal outcome.

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