Incidence and probable risk factors of stillbirth in Maternity Teaching Hospital in Erbil city

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Abstract

Background and objective: Death of an infant in utero or at birth has always been a devastating experience for the mother and of concern in clinical practice. The aim of this study was to determine the prevalence, probable risk factors and association of stillbirth with different maternal variables in Erbil Maternity Teaching Hospital.

Methods: A cross-sectional design was used to determine the prevalence of stillbirth and a case control design was used to determine the probable risk factors and demographic characteristics of women with stillbirth in Maternity Teaching Hospital in Erbil city, Kurdistan region, Iraq, from April 1st, to December 31st, 2011.Three hundred seventy nine women having stillbirth were regarded as cases while 758 women delivering alive newborns were regarded as control group.

Results: The prevalence of stillbirth during the period of the study was 20.4 per1000 total births. Macerated stillbirth was about four times higher than the fresh stillbirth. There were statistically significant differences between the cases and controls in relation to: maternal age (≥ 35 years), level of education, history of antenatal care visits, parity, medical diseases of the mother, congenital anomalies of the newborn, and history of previous stillbirth. In 65.4% of cases the probable cause of death was unexplained.

Conclusion: The prevalence of stillbirth in the Maternity Teaching Hospital in Erbil is high in comparison to the rate in other countries. This could be due to high level of deliveries per day and lack of good follow up of patients during labour.

Keywords: Stillbirth, Maternity hospital, Erbil, Iraq.

Introduction

The World Health Organization (WHO) and the international classification of diseases (ICD) defined stillbirth as the death of a fetus that has reached a birth weight of 500g, or if birth weight is unavailable, a gestational age of 22 weeks or crown-to-heel length of 25 cm.[1-2] Stillbirth is classified as fresh stillbirth when the baby born with an intact skin suggesting that the death occur during labour (less than 12 hours before delivery), and macerated still-birth, when there is signs of degeneration (peeling of skin, red serous effusions in the chest and abdomen due to hemoglobin staining) suggesting the death occur more than 12–24 hours before labour.[3-4] About 3.2 million stillbirths occur worldwide every year, 98% of these in the developing world, 5/1000 total deliveries in the developed world, 25-32/ 1000 total deliveries in the developing world.[1] Death of an infant in utero or at birth has always been a devastating experience for the mother and of concern in clinical practice. It is important to recognize that the loss of a fetus during pregnancy is a cause of major protracted psychological morbidity for some women and their families.[5] Stillbirths are both common and devastating, and in developed countries, about one third has been shown to be of unknown or unexplained origin.[5] There are several factors associated with fetal loss. Some of these have a clear causal link such as an abruption or a cord event, while others may contribute indirectly to fetal loss such as obesity. Some losses may be associated

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with multiple etiologies, for example, a fetal loss could be directly linked to an abruption, but the woman may have risk factors, such as antiphospholipid antibody syndrome (APS) positivity and pre-eclampsia.[1] Many of the risk factors may be modifiable or treatable, for example, maternal obesity, smoking, APS and pre-eclampsia. Knowledge of these risk factors will, therefore, help tailor the management preconceptually and during pregnancy.[1] Stillbirth rate is an important indicator of the quality of antenatal and obstetric care, but studies have not distinctively differentiated the frequency of and risk factors for macerated versus fresh stillbirths. Macerated stillbirths are often associated with insults that occur in utero during the antenatal period, while fresh stillbirths may suggest problems with the care available during labour and at delivery.[3-5] According to our knowledge, this study was regarded as the first to be conducted in Maternity Teaching Hospital in Erbil city to evaluate and determine the incidence of both macerated and fresh stillbirth, and the probable risk factors of stillbirth. The aim of this study was to find out the prevalence of stillbirth in the Maternity Teaching Hospital in Erbil city and to determine the probable risk factors associated with stillbirth.

Methods

This study was conducted in the Maternity Teaching Hospital in Erbil city, Kurdistan region, Iraq from April 1st, to December 31st, 2011. A hospital based cross sectional study was used to determine the prevalence of stillbirth and a case control design was used to determine the characteristics and any probable causes. The study sample included 1137 women. All women admitted to the Maternity Teaching Hospital and delivered stillbirth had been taken as cases, their number was 379 and 758 of the women delivered alive babies were taken as controls. The total deliveries in Maternity Teaching Hospital during the period of the study were 18601 deliveries.

Definition of cases: women with 22 weeks gestation or more or fetal weight of 500 grams or more, who delivered a still-birth whether fresh or macerated.

Definition of controls: women with 22 weeks gestation and more or fetal weight of 500 grams or more, who delivered alive baby. The data were obtained from the patients themselves by direct interview using a specially designed close ended questionnaire. The questionnaire included sociodemographic variables, medical history, previous obstetrics and current history, fetal monitoring during labour, mode of delivery, fetal outcome were recorded in the data collecting sheet. Antenatal care (ANC) was regarded as inadequate if the visits were 1-3 and adequate when the visits were ≥4.[6] Gestational ages (in weeks) graded as term if ≥37 weeks, preterm if (32 – 36 +6days), very preterm (28 – 31+6 days), extremely preterm (22-27+6 days). The weight of the babies(in grams) graded as normal birth weight if ≥2500 grams, low birth weight if <2500 grams, very low birth weight if <1500 grams, and extremely low birth weight if<1000 grams.[3, 7]

Ethical approval: the study proposal was approved by the Research Ethics Committee of Hawler Medical University. Informed verbal consent was taken from each participant of the study; the aim of the study was explained for each of them and confidentiality was reassured.

Statistical methods and data analysis
The data were analyzed using the statistical package for the social sciences (version 18). Chi-square test of association was used to compare between proportions and to show the significance of association between the disease (stillbirth) and different factors. When the expected count of more than 20% of the cells of the row X column table was less than five, Fisher's exact test was used. Student's t test was used to compare between two means. *P* value of ≤0.05 was considered as statistically significant.

Results

The prevalence of stillbirth in Maternity Teaching Hospital in Erbil city was 20.4 /1000 total births. There was a statistically significant difference between the cases and control in relation to mean maternal ages and the educational level. Higher percentage of smoking habit were among the cases (1.6%), compared to (0.3%) of the controls (P = 0.09). Maternal medical diseases (hypertension alone, hypertension and diabetes) were more common in the cases in comparison to controls (P <0.001). There was statistically significant difference between the cases and controls in relation to history of previous intrauterine fetal death (IUFD).

Higher percentage of patients with history of previous IUFD were among the cases (8.2%) compared to (4.2%) of the controls (P <0.001) as shown in Table 1. There was statistically significant difference between the cases and controls in relation to parity. Higher percentage of full term pregnancies were among the controls (75.2%), versus (28%) for the cases, this was also statistically significant. Higher percentage of no ANC visits were among the cases (9.5%), compared to (4.7%) of controls (P = 0.001). There was statistically significant difference between the cases and controls in relation to mode of delivery. In both groups, higher percentages of the fetuses were delivered vaginally (Table 2).

Table 1: Demographic character of the sample size.

Characters	Cases		Control		*P* value*
	No.	(%)	No.	(%)	
Mean age ± SD (years)	28.35 ± 6.53		26.43 ± 6.40		< 0.001
Education level					
Illiterate	113	(29.8)	310	(40.9)	< 0.001
Read and write	44	(11.6)	52	(6.9)	
Primary school	127	(33.5)	186	(24.5)	
Secondary school	71	(18.7)	146	(19.3)	
Higher education level	24	(6.3)	64	(8.4)	
Smoking	6	(1.6)	2	(0.3)	*0.019
Medical disease					
Hypertension	63	(16.6)	66	(8.8)	< 0.001
Diabetes	3	(0.8)	12	(1.6)	
Hypertension+Diabetes	7	(1.8)	2	(0.3)	
History of stillbirth	31	(8.2)	32	(4.2)	<0.001

*Fisher's exact test

Table 2: Obstetrics characters and mode of delivery in the sample size.

Obstetric characteristic	Cases		Control		*P* value
	No.	(%)	No.	(%)	
Parity					
Primigraivid	120	(31.7)	202	(38.5)	0.001
Para 1-4	207	(54.6)	390	(51.5)	
Para ≥ 5	52	(13.7)	76	(10)	
Gestational age (week)					
≥ 37	144	(28)	570	(75.2)	<0.05
32 – 36	85	(22.5)	136	(17.2)	
28 - 31	60	(15.8)	40	(5.3)	
22 – 27	90	(23.7)	12	(1.6)	
ANC visits					
No ANC visits	36	(9.5)	36	(9.5)	0.001
Adequate ANC visits	257	(67.8)	436	(57.5)	
Mode of delivery					
Vaginal delivery	357	(94.2)	686	(91.5)	< 0.001
Caesarean Section	22	(5.8)	72	(8.5)	

Regarding the probable risk factors of still-birth, higher percentage were unexplained (65.4%), followed by maternal medical diseases (12.4%), congenital anomalies (6.1%), preterm labour (5.8%), antepartum haemorrhage(4.7%),fetal asphyxia (3.7%), cord prolapse (1.3%),malpresentation (0.5%) and obstructed labour (0.3%). The macerated stillbirths were about four times higher than fresh (82.6% vs. 17.4%). Higher percentage of stillbirths were singleton pregnancies (93.4%) versus (6.6%), but the difference with the control group was not significant statistically. Regarding the gender, higher percentage of stillborns were male (53.7%) versus (46.3%) were female. About the birth weight, higher percentage of normal birth weight was among the controls (83.1%), versus (50%) for the cases, and this was statistically significant. Seventy five percent of full term pregnancies were among the controls while only 28% of cases with still birth was full term; this was statistically significant as shown in Table 3. There was statistically significant difference between the cases and controls in relation to the presence of congenital anomalies in the newborns.

Discussion

The incidence of stillbirth was 20.4 /1000 total births in Maternity Teaching Hospital in Erbil city within the period of the study. This was close to the incidence reported in a study done by Audu et al, conducted at maternity unit of Jos university teaching hospital in Nigeria in 2001, as the incidence was 22/1000 total births, [8] while in a case control study carried out by Kumar et al in rural areas in India stillbirth incidence was 26.8/1000 total birth. [9] This incidence was much higher in Stockholm in Sweden, as it was 3.2 per 1000 total deliveries according to a study done by Karin. This may be because of advance antenatal and delivery care in the developed countries while it still needs improvement in developing countries. [10] In this study, 17.4% of the IUFD were fresh deaths and 82.6% were macerated. Audu et al and Di Mario et al found that two-third

Table 3: Distribution of sample size according to fetal outcome.

Fatal outcome	Cases		Controls		P value
	No.	(%)	No.	(%)	
Singleton/Multiple					
Singleton	354	(93.4)	721	(95.1)	0.23
Multiple	25	(6.6)	37	(4.9)	
Sex					
Male	202	(53.7)	398	(52.5)	0.05
Female	174	(46.3)	360	(47.5)	
Birth weight(gm)					
≥ 2500	178	(50)	605	(83.1)	< 0.001
1500 – 2499	58	(16.3)	101	(13.9)	0.29
1000 – 1499	41	(1.5)	16	(2.2)	< 0.001
< 1000	79	(22.2)	6	(0.8)	< 0.001
Congenital anomalies	23	(6.1%)	8	(1.1%)	< 0.001

to three-quarters of still births may occur antenataly, before labour which are often associated with insults that occur in-utero during the antenatal period.[6, 10] The mean age of the mothers with IUFD was 28.35±6.53years, parallel to a study done by WHO in a hospital in Chandigarh, India which revealed that the mean age was 27± 5.6 years.[7] Higher incidence of stillbirth was among those women who do not have higher level of education. This agreed with the study done by Lyon et al, which concluded that stillbirth increases among those who were less likely to have higher levels of education.[11] There was a statistically significant association between stillbirths and lack of antenatal care, which agreed with studies done by Agudelo et al and Feresus et al.[12, 5] There was a statistically significant association between stillbirth and smoking. Magaanet al demonstrated the adverse effect of smoking during pregnancy as a risk factor of fatal death.[13] The current study revealed increased risk of stillbirth with parity. Humphery, Rizk and Hinkulaet al found that the risk of stillbirth increased with parity, frequency of gestational diabetes, hypertensive diseases, and increased number of deliveries.[14-16] There was a statistically significant association between stillbirth and maternal hypertension and diabetes. Archibonget al and Aliyuet al also found these medical diseases to be risk factors for stillbirth.[16, 17] In accordance with another study, this study found that congenital anomalies were a well-known risk factor for stillbirth, which agreed with a study done by Barklayet al.[7] Mothers with previous history of IUFD were at increased risk for stillbirth. This agreed with studies done by Kumeret al, Surkanet al and Samueloff et al as they found that women with previous IUFD were more liable to have stillbirth.[9, 18, 19] This study demonstrated that 91.6% of stillbirth were delivered vaginally, 2.6% delivered by assisted breech delivery and 5.8% by cesarean section. Abdou et al and Feresus et al found that stillbirths were less likely to

be delivered by cesarean section and more likely delivered by vaginal and assisted breech delivery.[3, 5] Regarding the probable causes of stillbirth in this study, unexplained causes for death was 65.4%.[20] There was no statistically significant difference between the two groups regarding the number of gestation. This may be because of the small number of the multiple pregnancies among the stillbirths which was only 25 cases. In this study higher percentage of stillbirth was found among male fetuses (52.9%), versus 47.1% who were female fetuses. Petridon et al and Gadowet al found that higher mortality rate among male fetuses.[21-22] Twenty two percent of the cases had fetal weight <1000 grams, versus 0.8% of the control group, at the same time 50% of the cases had fetal weight ≥2500, versus 83.1% of the control group (P <0.05). Higher percentage of birth weight of stillbirth was below the normal weight.[4, 23] More than 70% of cases delivered preterm dead newborns and this also may explain the cause of low body weight newborns. In this study, 23.7 % of cases were extremely preterm, 15.8% of cases were very preterm, 22.5% of the cases were preterm, versus 17.2% of the control group, at the same time 38% of cases were ≥37 weeks, versus 75.2% of the control group. This concluded that higher percentage of gestational ages of stillbirth were below term.[4, 8]

Conclusion

The prevalence of stillbirth during the period of the study in maternity teaching hospital in Erbil city was 20.4/1000 births. Macerated stillbirth rate was four times higher than the fresh stillbirth. Advanced maternal ages, low educational level, poor ANC, increased parity, maternal medical diseases (hypertension and diabetes), fetal congenital anomalies and women with previous IUFD were risk factors for stillbirth.

Conflicts of interest

The authors report no conflicts of interest.

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