Risk Factors Related to Intrauterine Fetal Death

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ABSTRACT

Background: Intrauterine fetal death is a traumatic event. Stillbirth rate is an important indicator to assess the quality of antenatal care. The objective of the study was to identify the risk factors related to intrauterine fetal death in patients admitted with intrauterine fetal death.

Methods: It was a descriptive study conducted in the department of Obstetrics and Gynaecology at B. P. Koirala Institute of Health Sciences from January to December 2014. Patients admitted with singleton pregnancy with intrauterine fetal death after 28 weeks gestation were included.

Results: There were 11,006 obstetric admissions. Of them, 152 women had intrauterine fetal death. There were 128(84.2%) women between 20-35 years of age. Out of 152, 81(53.3%) women were preterm and 39(2.1%) women were postterm. Primigravida were 77(50.7%) followed by 35(23%) of second gravida. Hypertension was the commonest identified risk factor in 30(26.78%) women. Out of 152 women, 49(32.2%) had not received formal education. Ten (6.6%) women had a past history of fetal death. Four (2.6%) women had medical disorder before pregnancy. One hundred and twenty five (82.2%) women had vaginal delivery, 21(13.8%) had caesarean section and 6(3.9%) had laparotomy for rupture uterus. The commonest indication for caesarean section was placenta previa for 7(33.33%) women. Four (2.6%) women had diabetes. Ninety five (62.5%) were male and 57(37.5%) were female babies. Five (3.3%) babies had malformations.

Conclusions: Hypertension in pregnancy was found to be the most common identified risk factor for intrauterine fetal death.

Keywords: Fetal death; pregnancy; risk factors.

INTRODUCTION

Intrauterine fetal death (IUFD) is a traumatic event to the mother and caregivers. WHO defines IUFD as death of the conceptus before complete expulsion or extraction from the mother, irrespective of duration of pregnancy.[1] Some countries define stillbirth as early as 16 weeks of gestation, where as others use a threshold as late as 28 weeks of gestation.[2-4] Stillbirth rate is an important indicator to assess the quality of antenatal and delivery care.[5] Maternal smoking, advanced age, high parity and obesity are recognized maternal factors whereas congenital anomalies, intrauterine growth retardation, cord complications and infections are the common fetal causes of antepartum stillbirth.[6] Despite efforts to identify the factors contributing to fetal death, a substantial portion of fetal deaths are still classified as unexplained intrauterine fetal demise.[7] The objective of this study was to identify the risk factors for IUFD among patients admitted at B. P. Koirala Institute of Health Sciences with IUFD.

METHODS

It is a descriptive study conducted in the department of Obstetrics and Gynaecology, BPKIHS from January-December 2014. The study was started after ethical approval from institutional ethical review board. All pregnant women diagnosed as singleton intrauterine fetal death at 28 or more weeks of gestation and who were admitted in antenatal ward during the study period were included. Patients were enrolled only after getting informed written consent. Gestational age assignment was based predominantly on last menstrual period. Risk factors related to maternal, fetal, placenta and cord was noted. Data related to the mother including age, level of education, number of pregnancy, gestational age receiving prenatal care, history of diabetes, gestational diabetes, chronic blood pressure, blood pressure at admission, infectious diseases during pregnancy, complicated delivery, history of IUFD,

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ruptured membrane more than 12 hours, glucosuria and proteinuria at admission were noted. Data related to the fetus including obvious structural abnormality, Rh incompatibility, fetal weight and gender were noted. Factors related to placenta such as intrauterine growth retardation, postdated delivery, third trimester hemorrhage as well as factors related to the cord such as true knot, cord prolapse and cord around the neck were recorded.

Structured questionnaires were used for collecting data of maternal demographic characteristics, past medical and obstetric history, index pregnancy, fetal, placental and cord assessment. Descriptive analysis was done using SPSS software.

RESULTS

Total number of antenatal admissions in 2014 was 11,006 and the number of deliveries was 10,245. There were 152 patients admitted with intrauterine fetal death. Stillbirth rate at our institute is 14.83 per 1000 births.

Intrauterine fetal death was seen more commonly in the age group of 20-35 years which comprised about 84.2% of the total patients (Table 1).

Table1. Demographic of the patients with IUFD (n=152).		
Age in years	Number (%)	Mean
≤19	16(10.5%)	
20-35	128(84.2%)	
>35	8(5.3%)	26.22±5.467
Level of Education		
Illiterate	49(32.2%)	
Primary	65(42.8%)	
Secondary	28(18.4%)	
Higher secondary and above	10(6.5%)	
Period of gestation in weeks		
<37	81(53.3%)	
37-42	68(44.7%)	35.48±4.285
>42	3(2%)	

As shown in table 1, primary level of education had been received by 65(42.8%) patients. Forty nine (32.2%) patients were not educated at all. Among 152 patients, 3(2%) were postterm. Majority 81(53.3%) were preterm. Gravida ranges from 1-7. Around 50.7% of the total patients were primigravida.

Out of 152 patients, 101(66.4%) patients did not have antenatal check up at any of the health centres. Remaining 14(9.2%) had regular check up at BPKIHS and 37(24.3%) had antenatal check up done at other health centres.

Out of 152 patients, 40 patients did not have any of the identified risk factors. Among 112 patients with some identified risk factors, the commonest risk factor was hypertension. The risk factors for IUFD are shown below in table 2.

Table 2.Risk factors for IUFD (n=152).	
Risk Factors	Number (n=152)
No identified risk factor	40
Hypertension complicating pregnancy	30
Antepartum hemorrhage	24
Postdated Pregnancy	17
IUGR	7
Sepsis	7
Malpresentation	6
Rupture Uterus	6
Oligohydramnios	5
Diabetes Mellitus	4
Cord Prolapse	4
Fall injury	1
Hepatic Encephalopathy	1

Out of 152 patients, 10(6.6%) patients had history of IUFD in their previous pregnancy. Similarly, there were 4(2.6%) patients who had a significant past medical history. Two were cases of overt diabetes, one had chronic hypertension and one had chronic liver failure.

Spontaneous onset of labour was seen in 97(63.8%) patients whereas 55(36.2%) patients were induced for labour. The mode of delivery was vaginal in 125(82.2%) women, caesarean in 21(13.8%) women and 6(3.9%) women underwent laparotomy for rupture uterus. The commonest indication for caesarean section was placenta previa followed by malpresentation.

Table 3. Birth weight of the baby (n=152).		
Birthweight(gram)	Number(%)	Mean
<1000	10(6.57)	
1000-<2000	57(37.5)	
2000-<3000	53(34.8)	2124.47±868.05
3000-<4000	30(19.73)	
>4000	2(1.31)	

Majority of the babies delivered 95(62.5%) were male and 57(37.5%) were female. No obvious malformations were seen in 147(96.7%) patients. Only 5(3.3%) had obvious malformations. One of the babies had anencephaly, one had hydrocephalus, one had hydrops fetalis and two had multiple anomalies.

Out of 152 patients, 11(7.2%) had developed

complications like pulmonary edema, diabetic ketoacidosis, acute kidney injury and postpartum depression. None of the patients developed disseminated intravascular coagulation.

DISCUSSION

Although overall perinatal mortality rates have fallen considerably in the past several decades, fetal deaths have not decreased as rapidly as the neonatal portion. These deaths are therefore difficult to prevent because the determinants have not been identified. IUFD rate at our institute is 14.8 per 1000 deliveries. The mean age of women at presentation was 26.22±5.467 years and majority 81(53.3%) were preterm. Forty (26.31%) women had no identified risk factors. Among the identified risk factor, hypertension was the commonest risk factor. Around 66.5% women did not have antenatal check up at any health centres.

Fetal death rate is influenced by multiple factors and that is why it may vary from one country to another. Stillbirth rate seems to be different in different studies. The study conducted by Shaaban et al found the IUFD rate as 10.1 per 1000 deliveries.[8] Stillbirth rate was 13.3 per 1000 deliveries in a study conducted by SR Shrestha in Patan Hospital, Nepal which was comparable with our study.[12]

Incidence of IUFD at Dhulikhel Hospital, Kathmandu was only 2.13% as shown by SR Tamrakar which was very low as compared to our study.[10]

Audu et al[9] and Imtiaz J et al [16] found the IUFD rate as 22 per 1000 deliveries and 33.6 per 1000 births respectively which was found to be higher as compared to IUFD rate at our institute. A retrospective study of IUFD at a tertiary care centre by Neetu Singh et al found the incidence of IUFD as 40 per 1000 births.[11]

Fetal death can be either in antepartum or intrapartum period. Some causes of fetal death, such as syphilis, are no longer a significant problem; others, such as cord accidents, have remained relatively unchanged for decades; some, like antiphospholipid antibodies, have only recently been recognized. Several causes like chromosomal abnormalities, are not preventable even with modern medical knowledge, whereas others, like postmaturity are completely preventable.

Antenatal fetal death is a significant contributor to perinatal mortality and challenges the adequacy of antenatal surveillance. IUFD was seen more commonly in unbooked patients in our study. Similarly Audu et al concluded that IUFD was more in unbooked patients (57.5%) as compared to booked patients (42.5%).[9] Rehan N found that 85% of stillbirths were unbooked and only

14.9% were booked.[13] Similarly, 55.7% of stillbirths were unbooked in a study conducted in a Nigerian teaching hospital.[15] This shows the importance of regular antenatal care throughout the pregnancy. Study from Pakistan showed the stillbirth rate was higher in unbooked case (176/1000) as compared to booked cases (37/10000) and was statistically significant.[13] This was in contrast to a study by SR Shrestha were seventy percent women had attended ANC in their hospital.[12] Lack of antenatal care may be associated with increased rate of stillbirth.[14]

In this study, primary level of education had been received by most of the patients which was about 42.8%. Around 32.2% of the patients were not educated at all. Imtiaz J et al[16] found that nearly one third of study population had no formal education. It can be seen that this level of education was not enough to realize the importance of antenatal check up during pregnancy.

In our study IUFD was seen more commonly in preterm fetus and so majority of the babies born were of low birth weight as shown in table 3. This finding was similar to a study by SR Shrestha where 40% of the stillborn babies were shown to be because of prematurity.[12] In a study from Pakistan which showed that 49% of stillbirths were preterm and 51% of the stillbirths occurred at 37 weeks of gestation or later and 19% occurred in between 34-36 weeks of gestation, also concluded that there was no much difference in number between preterm and term fetuses.[16] In a study conducted by Neetu Singh et al, 64.18% of IUFD were between 37-40 weeks whereas 31.07% were preterm.[11]

Stillbirths are often associated with maternal, placental or fetal abnormalities. Intrapartum fetal death reflects poor quality of clinical care. Identifying the risk factors for death may aid its prevention. In our study around 26.31% of the patients with IUFD had no identified risk factors. Shabaan et al[8] concluded that 28.8% of women were without any identified risk factors and was comparable with our study. In contrast, Kuti O et al[15] conducted a study and found that 40% of the antepartum fetal deaths had no identifiable risk factors. Neetu Singh et al found no causes of IUFD in 33.44% of the patients.[11] SR Shrestha and BK Yadav found 18% of stillbirths were classified as unexplained stillbirth.[12]

Among the identified risk factors, hypertension was the leading cause followed by antepartum hemorrhage. Shabaan et al also concluded that hypertension was the commonest identified risk factor seen in 29.3% of the patients followed by abruption in 14% of the patients.[8] In contrast, antepartum hemorrhage (20%) was the commonest identified risk factors followed by hypertension(11.4%) in a study conducted by Kuti et al.[15]

Imtiaz et al in their study found antepartum hemorrhage as the commonest identified risk factor.[16] Severe anemia was the commonest identified risk factor as shown in a study by Singh et al.[11] Study from Pakistan showed that the most prominent risk factors for stillbirth were abnormal labour (23%), antepartum hemorrhage (17%) and malpresentation (16.5%).[13]

IUFD in previous pregnancy is also an important risk factor for intrauterine fetal death in the index pregnancy. In this study, only 10(6.6%) patients had a past history of IUFD. Shabaan et al[8] also found that 8.3% patients had past history of IUFD and 4.05% of patients had history of IUFD in their previous pregnancy as shown by Singh et al [11] which were comparable with our study. It was high about 12.3% in a study conducted by Audu et al.[9] At least one pregnancy loss was seen in 23% of women.[16] These studies document that past history of pregnancy loss is a risk factor for IUFD.

In our study, 50.3% of the patients who presented with IUFD were primigravida. Similarly in a study conducted by SR Tamrakar in Dhulikhel hospital, IUFD was seen more in primiparous patients. Incidence gradually decreases as parity increases.[10] In contrast Audu B et al concluded that multiparous were two times more likely to have IUFD than primiparous.[9]

Congenital malformation in fetus is also considered as a risk factor for intrauterine fetal death. Congenital malformations were obvious in 3.3% of the patients in our study. Among the fetal factors for intrauterine fetal death, congenital malformation was seen in 2.3% in a study conducted by Rehan. [13] Imtiaz et al [16] found congenital anomaly as a risk factor for intrauterine fetal in 5.7% of women. SR Shrestha and BK Yadav found 6% of stillbirths had congenital anomalies.[12] Congenital anomalies were present in about 9.45% of IUFD in a study conducted by Singh et al.[11]

The mode of delivery is always an important issue to be addressed especially for IUFD. Our study documented that 82.2% of women had vaginal delivery and 13.8% had caesarean section mainly for placenta previa and/or malpresentation. Almost all the studies had shown the higher rate for vaginal delivery as compared to caesarean section. Singh et al found that 11.48% of women with IUFD had caesarean section either for placenta previa, transverse lie, previous two caesarean sections or obstructed labour.[11] Caesarean section was conducted in 14% of stillbirths.[16]

Among the stillbirth babies, male preponderance (62.5%) was seen in our study. This finding was also documented in other similar studies where the male preponderance was seen. In a study conducted in Pakistan by Rehan, there was a preponderance of male (55.5%), the sex ratio being 1.34.[16] In a retrospective study of cases of intrauterine fetal death, male fetuses were 54.05% and 45.94% were females. [11] Similarly, 60% of the stillbirth fetuses were male in a study by Imtiaz et al. [16]

Women with IUFD can develop complications like disseminated intravascular coagulation. This complication is seen less frequently these days and it might be because of early diagnosis with the easy availability of ultrasound machines and early delivery.

Identification of the risk factors not only helps us to identify the high risk population but also help in the development of risk reducing interventions as far as possible.

CONCLUSIONS

The commonest identified risk factor in this study is hypertension which seems to be a preventable risk factor for IUFD but still the unidentified risk factors for IUFD are of great challenge to all the obstetricians. We should emphasize on regular antenatal care so that early detection and treatment of hypertension can be done.

REFERENCES

1. Smith GC. Sex, birth weight, and the risk of stillbirth in Scotland, 1980–1996. Am J Epidemiol. 2000; 151(6):614-9. [DOI]

2. Sachs BP, Fretts RC, Gardner R, Hellerstein S, Wampler NS, Wise PH. The impact of extreme prematurity and congenital anomalies on the interpretation of international comparisons of infant mortality. Obstetrics & Gynecology. 1995 Jun 1; 85(6):941-6.[DOI][Science Direct]

3. Cartlidge PH, Stewart JH. Effect of changing the stillbirth definition on evaluation of perinatal mortality rates. The Lancet. 1995; 346(8973):486-8.[Science Direct][DOI]

4. Wilson AL, Fenton LJ, Munson DP. State reporting of live births of newborns weighing less than 500 grams: impact on neonatal mortality rates. Pediatrics. 1986; 78(5):850-4.[Link]

5. Say L, Donner A, Gülmezoglu AM, Taljaard M, Piaggio G. The prevalence of stillbirths: a systematic review. Reprod Health. 2006; 3(1):1.[DOI]

6. Gabriela CA. Systematic review on the incidence/prevalence of stillbirths. Geneva: Geneva Foundation for Medical Education and Research (WHO). 2001.[FullText]

7. Chiswick ML, Standing Joint Committee of the British Paediatric Association and the Royal College of Obstetricians and Gynaecologists. Commentary on

current World Health Organization definitions used in perinatal statistics. BJOG: An International Journal of Obstetrics & Gynaecology. 1986; 93(12):1236-8.[DOI]

8. Shaaban LA, Al-Saleh RA, Alwafi BM, Al-Raddadi RM. Associated risk factors with ante-partum intra-uterine fetal death. Saudi Med J. 2006; 27(1):76-9.[Link]

9. Audu B, Alhaji M, Takai U, Bukar M. Risk factors for stillbirths at universty of Maiduguri teaching hospital, Maiduguri, Nigeria: a cross-sectional retrospective analysis. Niger Med J. 2009; 50(2):42-.[FullText]

10. Tamrakar SR, Chawla CD. Intrauterine foetal death and its probable causes: Two years experience in Dhulikhel Hospital—Kathmandu University Hospital. Kathmandu Univ Med J. 2012; 10(4):44-8.[FullText]

11. Neetu Singh, Kiran Paudel, Neena Gupta, AK Arya, Charu Pratap, Roshika Naik. A retrospective study of 296 cases of IUFD at tertiary care centre. Int J Reprod Contracept Obstet Gynecol. 2013; 2 (2): 141-146.

12. Shrestha SR, Yadav BK. Risk Factors Associated with StillBirths. J Nepal Med Assoc. 2010; 49 (177): 84-87. PMID:21180228

13. Rehan N. Still births in a Hausa community. Journal of the Pakistan Medical Association. 1982; 32(7):156-62.[Link]

14. Weiner R, Ronsmans C, Dorman E, Jilo H, Muhoro A, Shulman C. Labour complications remain the most important risk factors for perinatal mortality in rural Kenya. Bull World Health Organ. 2003; 561-6.[Link]

15. Kuti O, Owolabi AT, Orji EO, Ogunlola IO. Antepartum fetal death in a Nigerian teaching hospital: aetiology and risk factors. Tropical Journal of Obstetrics and Gynaecology. 2003; 20(2):134-6.[DOI]

16. Jehan I, McClure EM, Salat S, Rizvi S, Pasha O, Harris H, Moss N, Goldenberg RL. Stillbirths in an urban community in Pakistan. Am J Obstet Gynecol. 2007 Sep 1; 197(3):257-e1.[Science Direct][DOI]