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Risk Factors associated with Intrauterine Fetal Death at Birat Medical College Teaching Hospital

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ABSTRACT

Background & Objective: Intrauterine fetal death is a tragic event, and despite efforts to reduce its incidence, it remains challenging to do so. Intrauterine fetal death is an important indicator of the maternal and perinatal health of a given population. This study aims to identify the maternal and fetal factors associated with intrauterine fetal death.

Material and Methods: This is a descriptive cross-sectional study conducted in Obstetrics ward of Birat Medical College Teaching Hospital from 1st July 2021 to 31st August 2022. All pregnant women with ultrasound confirmed intrauterine fetal death after 28 or more weeks gestation who were admitted to the Obstetrics ward of Birat Medical College Teaching Hospital in the study period were enrolled in the study.

Results: There were 4562 antenatal admissions and 3852 deliveries in the study period. Of these, 35 pregnant women were admitted with intrauterine fetal death. The intrauterine fetal death rate was 11 per 1000 deliveries in our institution. The mean age of women at presentation was 25.94±4.82 years, and 85.7% of pregnant women between the ages of 20-35 years. Of the study participants, 34.3% were Janajati and 82.9 % were Hindu. Out of 35 pregnant women, 37.1% had not received formal education, and all of them were housewives by occupation. Only one patient was smoker, and none of them were alcoholic. Among the 35 pregnant women, 40 % were preterm, 57.1% were term, and 2.9% were post-term. The majority (60%) of them were multigravida. Hypertensive disorder in pregnancy was the most common identified risk factor in 25.7% of pregnant women, and in 37.1 % of cases, causes were not identified. Out of the 35 pregnant women, 34 underwent vaginal delivery, while one

underwent a caesarean section for placenta previa.

Conclusion: Most of the pregnant women with intrauterine fetal death were illiterate housewives. The most commonly identified risk factor in this study was hypertensive disorder in pregnancy, which is preventable by regular antenatal care and timely intervention. Therefore, we should emphasize the importance of regular antenatal care for early detection and treatment of hypertension and other risk factors.

Keywords: Intrauterine fetal death, pregnancy, risk factors

INTRODUCTION

Intrauterine fetal death (IUFD) is a traumatic event for both the mother and the family as a whole and remains a challenge for obstetricians. IUFD is defined as fetal death after 20 weeks of gestation [1]. It can be further classified into early or late IUFD, with early IUFD occurring gbefore 24 weeks of pregnancy and late IUFD occurring after 24 weeks [1]. The incidence of IUFD is 0.5–1% of all pregnancies [2]. As gestational age advances, the risk of fetal death declines, and it occurs with increased frequency at the extremes of reproductive age, in women with high parity, those with medical problems, smokers, and the socially disadvantaged [3-7].

Demographic factors for fetal death include race, low socioeconomic status, inadequate prenatal care, less education and advanced maternal age [8]. Several risk factors have been highlighted regarding the etiopathogenesis of IUFD in various studies. The frequently identified risk factors are a high body mass index, maternal age above 35 years, smoking and high blood pressure in pregnancy [9]. The most common etiopathogenesis of the occurrence of IUFD is Placental involvement [10,11]. Other causes of IUFD are maternal- fetal haemorrhage, chromosomal abnormalities, malformations and infections [9].

The confirmatory diagnosis of IUFD is made on fetal ultrasound. To decrease intrauterine fetal death rate in a population, it is necessary to know the etiology of fetal death and its associated risk factors. A few studies have been done on this subject to identify the risk factors of IUFD. Counseling of patients and their families for obstetrical intervention is often based upon data regarding the risk factors for IUFD. By knowing the risk factors associated with IUFD and ensuring proper antenatal checkups, the incidence of IUFD can be decreased. The aim of this study was to analyze the maternal and fetal factors associated with IUFD.

MATERIAL AND METHODS

This was a descriptive cross-sectional study conducted in the Obstetrics ward of Birat Medical College Teaching Hospital, Biratnagar, Nepal from 1st July 2021 to 31st August 2022. Ethical clearance was obtained from the Institutional Review Committee of Birat Medical College Teaching Hospital (Ref: IRC-PA-194/2078-79).

All the pregnant women with ultrasonography confirmed Intrauterine fetal death after 28 or more weeks of gestation who were admitted to the Obstetrics ward of Birat Medical College Teaching Hospital during the study period were enrolled. Pregnant women with Period of gestation less than 28 weeks were excluded from the study. Gestational age was based on the last menstrual period. The participants were

informed about the aim of study, and informed consent was obtained prior to data collection. Only those women who had given consent were enrolled in the study. Risk factors related to maternal, fetal, placental and cord factors were noted. Data related to the mother, including age, caste, religion, occupation, smoking and alcohol use, education level, gestational age, history of gestational diabetes, chronic blood pressure, blood pressure at admission and infectious diseases during pregnancy were recorded. Data related to the fetus, including obvious structural abnormality and fetal weight, were noted.

Factors related to placental abnormalities and cord factors, such as true knot, cord prolapse and cord around the neck were also recorded. Structured questionnaires were used to gather information. Total enumeration sampling technique was used for sample collection. Faceto face interviews and patients' inpatient record files were used for data collection by the researcher, using a preformed proforma. Confidentiality was maintained throughout the study. The collected data were entered in Microsoft Excel and analysed by using SPSS version 22. Data were presented in frequency, percentage, mean and standard deviations.

RESULTS

There were 4565 antenatal admissions and 3852 deliveries during the study period. Among them 35 pregnant women were admitted with intrauterine fetal death. The IUFD rate was 11 % per 1000 deliveries in our institution. Table1 presents the socio-demographic profile of the patients, where themean agewas 25.94 ±4.82 years and majority (85.7 %) of patients belonged to the age group of 25 to 35 years. Most of the patients (74.3%) were from rural areas, 88.6 % of women followed the Hindu religion, 34.3 % belonged to the Janjati ethnicity, and 36.1% were Illiterate aadditionally 100% of the women were housewives.

Table 1: Socio-demographic profile of respondents (n = 35)

Variables	Frequency (%)
Age (years)	
<20	2(5.7)
20-35	30(85.7)
>35	3 (8.6)
Caste	
Dalit	1(2.9)
Janjati	12(34.3
Madhesi	8(22.9)
Muslim	5(14.3)
Brahmin/Chetri	9(25.7)
Religion	
Hinduism	30(85.7)
Muslim	5(14.3)
Education status	
Illiterate	12(34.3)
Primary	11(31.4)
Secondary	6(17.1)
Higher secondary and above	6(17.1)
Occupation	
Housewives	35(100)

Most of the patients (25.70%) had Hypertensive disorder in pregnancy, followed by post-dated pregnancy in 17.1% of women, IUGR in 14.3 % of women, and Gestational Diabetes Mellitus in 11.4 %.No identified risk factor was found in 37.1% of cases, as shown in table 2. One hypertensive patient had IUGR and one had Diabetes. One hypertensive patient had both IUGR and antepartum haemorrhage.

Table 2: Risk for IUFD (n=35)

Risk Factors	Number (%)
Smoking	1(2.9)
Hypertension	7(20)
Gestational Diabetes Mellitus	4(11.4)
IUGR	5(14.3)
Antepartum Haemorrhage	2(5.7)
Post-dated pregnancy	6(17.1)
Cord prolapse	1(2.9)
No identified risk factor	13(37.1)

Most of the patients (54.3%) with IUFD were unbooked as shown in table 3.

Tale 3: Booking status (n=35)

Variables	Frequency (%)
Booked	16(45.7)
Unbooked	19(54.3)

Out of 35 patients 60 % were multigravidas and 40 % were primigravida shown in table 4. Most of the patients (57.1 %) were of 37-42 period of gestation (POG), 40 % of patients less than 37 weeks POG and 2.9 % patients were of post-dated shown in table 5.

Table 4: Gravidity of women (n=35)

Variables	Frequency (%)
Primigravida	14 (40)
Multigravidas	21(60)

Table 5: Period of gestation in weeks

Period of gestation	Frequency (%)
<37	14(40)
37-42	20(57.1)
>42	1(2.9)

Table 6 shows the birth weight of the baby. Most of the baby born was weighing between 2000 gm to 3000 gm.

Table 6: Birth Weight in gram

Birth Weight	Frequency (%)
<1000 gm	5(14.3)
1001-2000 gm	10(28.6)
2001- 3000 gm	17(48.6)
3001-4000 gm	3(8.6)

DISCUSSION

Although overall perinatal mortality rates have fallen considerably in the past several decades, fetal deaths have not decreased as rapidly as neonatal death. The death of a fetus is distressing for both the family and the obstetrician. Despite advances in diagnostic and therapeutic modalities, stillbirth rates in developing countries remain high. The objective of this study was to investigate

which risk factors were associated with fetal death in the Eastern part of Nepal. Hence, proper documentation and evaluation of the risk factors will be very helpful in decreasing the IUFD rate.

IUFD rate is influenced by multiple factors, which is why it may vary from one country to another. The IUFD rate appears to differ in various studies. In our study, the IUFD rate was 11 per 1000 deliveries, which is higher than a study, done by Kuikel S et al which showed the IUFD rate was 8 per 1000 births[12]. Another study done by Thakur A et al., at B.P. Koirala Institute of Health Sciences (BPKIHS) showed that the IUFD rate was 14.83 per 1000 births [13] which were higher than our study. However, the Incidence of IUFD at Dhulikhel Hospital, Kathmandu, was only 2.13% [14] as shown by Tamrakar SR et al., which were significantly lowerthan our study. In our study, the mean age of women was 25.94±4.82 years and 85.7% were between 20-35 years which was similar to study done by Thakur A et al. In this study mean age 26.22±5.467 years 84.2% of woman between 20-35 years [13] which was comparable to our study.

IUFD can be either in antepartum or intrapartum period. Some causes of fetal death, such as cord accidents, have remained relatively unchanged for decades. Causes like chromosomal abnormalities are not preventable even with modern medical knowledge, whereas causes of IUFD like post maturity are completely preventable. Other causes like Hypertensive disorder in pregnancy, Gestational diabetes, IUGR is preventable with proper vigilant monitoring and treatments. Antenatal fetal death challenges the adequacy of antenatal surveillance. IUFD was seen more commonly in unbooked patients (54.3%) in our study. Similarly, Audu et al concluded that IUFD was more in unbooked patients (57.5%) as compared to booked patients (42.5%)[15]. Rehan N et al found that 85% of stillbirths were unbooked and only 14.9% were booked [16]. Similarly, 55.7% of stillbirths were unbooked in a study conducted in a Nigerian teaching hospital [17]. This shows the importance of regular antenatal checkup throughout the pregnancy. Study from Pakistan showed the IUFD rate was higher in unbooked cases (176/1000) as compared to booked cases (37/1000) and was statistically significant [18]. This was in contrast to a study by SR Shrestha where 70 % women with IUFD had attended ANC in their hospital [19].

In this study 34.3 % of women were illiterate and 31.4% had a primary level of education. This finding is similar to a study done by Thakur A et al showing that the primary level of education had been received by 42.8% and 32.2% of the women were not educated at all [13]. It can be seen that this level of education was not enough to realize the importance of antenatal checkup during pregnancy.

In our study among the identified risk factors, Hypertensive disorder in pregnancy (25.7%) was the leading cause followed by Post-dated pregnancy (17.1%) followed by IUGR in 14.3% cases and no identified risk factor found in 37.1% of cases. This is comparable to a study done by Thakur A et al hypertension was the commonest identified risk factor in 26.78% women [13]. Similarly, Shabaan et al also concluded that hypertension was the commonest identified risk factor seen in 29.3% of the patients [20]. In contrast to our finding, antepartum

haemorrhage (20%) was the commonest identified risk factor followed by Hypertension (11.4%) in a study conducted by Kuti et al [21]. Severe anemia was the commonest identified risk factor in a study done by Singh N et al. [22].

In our study 37.1 % of IUFD causes were not identified. A study conducted by Kuti O et al found that 40% of the antepartum fetal deaths had no identifiable risk factors [21]. In contrast to our study, a study done by Thakur A et al 26.31% of the patients with IUFD had no identified risk factors [13]. Shabaan et al concluded that 28.8% of women were without any identified risk factors [20].

In our study IUFD was seen more commonly in term pregnancy (57.1%) and 40 % were preterm. Majority of the babies born were of weight between 2001- 3000 gm. This finding was similar toa study conducted by Singh N et al. in which 64.18% of IUFD were between 37-40 weeks whereas 31.07% were preterm [22]. Similar to this study conducted by SR Shrestha et al where 40% of the IUFD babies were of prematurity [19]. In contrast to this study, studies conducted by Thakur A et al showed IUFD was seen more commonly in preterm fetuses [13].

In our study, 60 % of the patients who presented with IUFD were multigravida. This finding is similar to a study done by Audu B et al concluded that multiparous were two times more likely to have IUFD than primiparous [15]. In contrast to this study conducted by Thakur A et al [13] and SR Tamrakar et al [23], IUFD is more common in primigravida. Incidence gradually decreases as parity increases. Congenital malformation in the fetus is also considered as a risk factor for intrauterine fetal death. Congenital malformations were obvious in 1 (2.9%) of the patients in our study. Similar to our study congenital malformation is seen in 2.3 % of patients [24] in a study conducted by Rehan N et al. In contrast to this study conducted by SR Shrestha and BK Yadav found 6% of stillbirths had congenital anomalies [19]. Congenital anomalies were present in about 9.45% of IUFD [22] in a study conducted by Singh N et al.

The mode of delivery is always an important issue to be addressed especially for IUFD. In our study 97.1% of patients underwent vaginal delivery only 1 patient (2.9%) underwent a caesarean section for placenta previa. Almost all the studies had shown the higher rate for vaginal delivery as compared to caesarean section in case of IUFD. Singh N 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 [22]. 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.

CONCLUSION

Most of the pregnant women with IUFD in this study were illiterate housewives. The causes of IUFD are multiple. The most commonly identified risk factor in this study is hypertensive disorder in pregnancy, which seems to be a preventable risk factor for IUFD. However, in many cases risk factors for IUFD are not identified which poses a great challenge to all the obstetricians. Therefore, we should emphasize early and regular monitoring of all pregnancies through regular antenatal care to facilitate the early detection

and treatment of risk factors, ultimately reducing the incidence of IUFD.

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Conflict of interest

We declare no conflict of interest.

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