Original Research Article

Identify Common Risk Factors Associated with Intrauterine Fetal Death (IUFD): A Cross-sectional Study

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Abstract

Background: The definition of stillbirth recommended by WHO for international comparison is a baby born with no sign of Life at or after 28 weeks gestation. ***Aim of the study:*** The study aims to identify common risk factors associated with IUFD in Gaibandha 250 Bedded District Hospital, Gaibandha, Bangladesh. ***Methods:*** This Cross-sectional study was conducted at the Department of Gynecology & obstetrics, Gaibandha 250 Bedded District Hospital, Gaibandha, Bangladesh. participant was recruited retrospectively from medical records spanning one year from March, 2023 to Feb 2024. ***Result:*** The study involves 75 participants, predominantly aged 21-30 (57.90%) with primary education (55.00%). Most are housewives (65.50%) with average income. Pregnancy experience varies, with 2-3 pregnancies being the most common (36.40%). Most have normal systolic blood pressure (81.80%) and mild anemia (78.40%). Obstetric history includes abortion (18.20%) and IUFD (13 patients). Regular antenatal care (63.60%) is prevalent. Gestational age is >36 weeks for 37% of cases. Birth weights range primarily from 1-2kg (39%). Maternal factors contribute significantly to intrauterine fetal demise (IUFD), including chronic hypertension, pre-eclampsia, and premature rupture of membranes (PROM). ***Conclusion:*** The findings underscored the significant impact of maternal, fetal, and socio-demographic variables on IUFD incidence. Maternal factors such as hypertension and pre-eclampsia emerged as significant contributors, alongside fetal and cord-related issues. Socioeconomic disparities and inadequate antenatal care underscored the importance of holistic healthcare interventions to mitigate IUFD risks.
Keywords: Risk factors, stillbirth, IUFD.

INTRODUCTION

Intrauterine fetal death (IUFD) is a distressing occurrence for both mothers and healthcare providers. According to the World Health Organization (WHO), IUFD refers to the demise of the fetus before complete expulsion or extraction from the mother, regardless of the pregnancy's duration [1]. The definition of stillbirth varies among countries, with some setting the threshold as early as 16 weeks of gestation while others extend it to 28 weeks [2-4]. Monitoring the stillbirth rate is crucial for evaluating the effectiveness of prenatal and delivery care [5]. In developed countries, IUFD affects approximately 3 out of 1000 pregnancies, while the incidence can soar to 45 per 1000 pregnancies in developing nations. Fetal death, a significant portion of perinatal mortality worldwide, encompasses both antepartum and intrapartum fetal deaths. Alarmingly, nearly 2 million stillbirths occur annually, equating to one every 16 seconds, with over 40% happening during labor [6]. In 2019, Bangladesh recorded approximately 72,508 stillbirths, with a rate of 24.3 per 1,000 births, as per the inaugural joint UN estimate. Various risk factors contribute to IUFD, broadly categorized as general and specific. General factors include socio-demographic elements such as residence, occupation, and education, whereas specific factors involve fetal, maternal, umbilical cord, and placental issues. Pregnancy at an early age, specifically 16 years or younger, escalates the risk of IUFD by fourfold [7]. In developing countries, prevalent risk factors for fetal death encompass antepartum hemorrhage, labor mismanagement, congenital anomalies, pregnancy-induced hypertension, prolonged rupture of membranes, and underlying

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medical conditions like cardiac disease and diabetes mellitus [8]. During the third trimester, umbilical cord complications emerge as the leading cause of fetal demise. Unfortunately, these complications are often deemed unpreventable and unpredictable. Conversely, insertion anomalies such as velamentous insertions, nuchal cords, and knots occur relatively frequently and are not necessarily linked to fetal death [9]. Unexplained antepartum deaths are the primary cause of near-term stillbirths, with a higher likelihood of undergoing autopsy [10]. Several national and international studies have explored common risk factors for IUFD, revealing varying results. These studies indicate that fetal causes contribute to 25-40% of cases, placental causes to 25-35%, maternal causes to 5-10%, and in 25-35% of instances, the cause remains unidentified [11-14]. In Bangladesh, inadequate antenatal care and limited awareness among women lead to many unnoticed IUFD cases, even when preventable measures could have been taken. However, local data on IUFD risk factors are scarce. Hence, this study aims to identify common risk factors associated with IUFD in Gaibandha 250 Bed District Hospital, Gaibandha, Bangladesh.

METHODOLOGY & MATERIALS

This Cross-sectional study was conducted at the Department of Gynecology & obstetrics, Gaibandha 250 Bedded District Hospital, Gaibandha, Bangladesh. Participant was recruited retrospectively from medical records spanning one year from March, 2023 to Feb 2024. Throughout the study duration, 75 cases of intrauterine fetal death were identified, and their associated risk factors were analyzed. Prior to data collection, informed consent was obtained from each participant.

Inclusion Criteria:
* All pregnant- woman after 28 weeks of gestation
* Admitted for intrauterine fetal death.
* Among which fetuses who does not show any sign of birth after delivery

Exclusion Criteria:
* Pregnancy before 28 weeks of gestation.
* Cong, anomaly of the baby.
* Pregnancy & systemic diseases i.e. heart disease, renal failure.
* History of taking feto toxic drugs.

Data Analysis:

Data collection in this study employed a pre-tested questionnaire to gather information. We delved into various aspects, including socio-demographic characteristics, gyneco-obstetrical profile, pregnancy progression, and fetal characteristics during expulsion or based on ultrasound findings. Socio-demographic variables encompassed age, education level, occupation, and marital status. Gyneco-obstetric variables included gravidity, parity, history of intrauterine fetal demise (IUFD), and history of abortion. A structured form facilitated data collection. Results were organized into tables and graphs based on relevance, with accompanying descriptions for clarity. Statistical analysis utilized the Statistical Package for Social Science (SPSS) software on the Windows platform.

RESULT

The study includes 75 participants. Table 1 shows the socio-demographic characteristics of the study population where most participants fall within the 21-30 age group (57.90%), followed by the 31-40 age group (32.50%) and the highest percentage of participants have completed primary education (55.00%). Among the participants, most of the individuals (65.50%) are housewives, while the least of the participants (7.50%) are civil servants and majority of participants were average income (Table 1). The most significant proportion of participants have experienced 2-3 pregnancies (36.40%), followed closely by those with 4-5 pregnancies (27.30%) and those with one pregnancy (25.10%). 45.50% have a parity of 2-3, followed by those with a parity of 1 (27.30%) (Table 2). Regarding obstetric history, 18.20% had history of abortion and same 13 patients a history of IUFD. Most of the participants receive regular ANC (63.60%). A smaller percentage report irregular ANC attendance (25.00%), while a minority receive no ANC (11.40%) (Table 2). In this study, a significant proportion of the population (81.80%) have a systolic BP below 140 mm of Hg, indicating normal blood pressure levels. A smaller proportion of participants have a systolic BP above 140 mm of Hg (18.20%). Most participants have a diastolic BP below 90 mm of Hg, and 27.30% have above 90 mm of Hg. Hemoglobin (Hb%) levels demonstrate 63.60% of individuals with Hb levels of 8-10 gm/dl and 9.10% with Hb levels below 8 gm/dl. Most participants exhibit mild anemia (78.40%), while a smaller percentage have moderate anemia (12.50%). No participants exhibit severe anemia (Table 3). Figure 1 shows a gestation age of >36 weeks for 37% and 28-32 weeks for 36% of populations. A more significant percentage of babies have a birthweight of 1-2kg (39%), followed by 2-3kg (34.70%), whereas only 6.57% of babies have a birthweight of less than 1kg (Figure 2). Maternal factors contribute significantly to the risk of IUFD, with 45.45% of cases attributed to maternal factors. Among these, chronic hypertension (9.09%), pre-eclampsia (9.09%), and premature rupture of membranes (PROM) (9.09%) are identified as specific maternal risk factors. Cord factors are also implicated in IUFD, accounting for 36.36% of cases. Similarly, fetal factors contribute to 36.36% of IUFD cases, and IUGR accounts for 27.27% of IUFD cases (Table 4).

Table 1: Socio-demographic characteristics of the study population (N=75)

Variables	Frequency (n)	Percentage (%)
Age group (in years)		
≤20	3	5.30
21-30	44	57.90
31-40	25	32.50
≥40	3	4.30
Level of education		
Primary	42	55.00
Secondary	21	27.27
Graduate	9	13.20
Illiterate	3	4.50
Occupation		
Housewives	50	65.50
Civil servant	5	7.50
Student	7	10.00
Unemployment	13	17.00
Socioeconomic condition		
Below average	29	37.50
Lower middle	24	31.25
Middle	18	25.00
Upper	4	6.25

Table 2: Clinical presentation of the study population (N=75)

Variables	Frequency (n)	Percentage (%)
Gravidity		
1	19	25.10
2-3	28	36.40
4-5	20	27.30
>5	8	11.20
Parity		
1	21	27.30
2-3	35	45.50
4-5	13	18.20
>5	6	9.00
History of abortion		
Yes	13	18.20
No	62	81.80
History of IUFD		
Yes	13	18.20
No	62	81.80
ANC		
Regular	48	63.60
Irregular	19	25.00
None	8	11.40

Table 3: Gynecological-obstetric profile of the study population (N=75)

Variables	Frequency (n)	Percentage (%)
Systolic BP		
<140 mm of Hg	62	81.80
>140 mm of Hg	13	18.20
Diastolic BP		
<90 mm of Hg	55	72.70
>90 mm of Hg	20	27.30
Hb% (gm/dI)		
>10	21	27.30
8-10	48	63.60

Variables	Frequency (n)	Percentage (%)
<8-7	6	9.10
<7	0	0.00
Anaemia		
Mild	59	78.40
Moderate	10	12.50
Severe	0	0.00
Absent	6	9.10

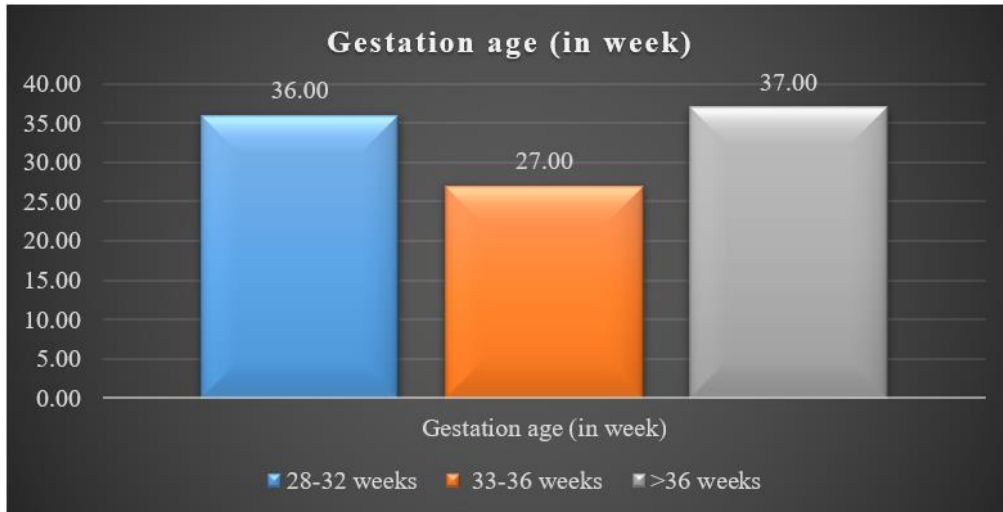**Figure 1: Distribution of gestation age in weeks**

Figure 2: Birthweight of the babies

Table 4: Risk factors for IUFD (N=75)

Risk factors	Frequency (n)	Percentage (%)
Maternal Factor	35	45.45
Chronic HTN	6	9.09
Pre-eclampsia	6	9.09
PROM	6	9.09
Cord Factor	28	36.36
Fetal Factor	28	36.36
Severe IUGR	20	27.27
Unexplained	7	9.09

DISCUSSION

In our investigation, the majority of stillbirth cases were found among individuals aged 21-30 years, constituting 57.9% of all instances, consistent with Nayak *et al.,*'s findings [15]. Similar results were also reported by Kumari *et al.,* and Nayak *et al.,* [15,16]. This demographic trend can be attributed to prevalent early marriages, particularly common in rural areas where most referrals originate. Most patients in our study had received only primary education (55%), with 13.2% being graduates and 4.5% having no formal education. This aligns with Momo *et al.,*'s discovery that 2.5% of their study population had no formal education [17]. The low level of education may hinder healthcare providers' understanding of counselling. Our study revealed that most women were homemakers (65.5%), consistent with Momo *et al.,*'s findings [17]. Poor socioeconomic conditions, illiteracy, and entrenched traditional beliefs were identified as contributory factors to intrauterine fetal demise (IUFD). A significant portion of the study patients (37.5%) fell below the average socioeconomic category, with 31.25% classified as lower middle class, mirroring results found by Bhatia *et al.,* and Kumari *et al.,* [16,18]. This economic constraint often results in irregular (25%) or absent (11.4%) antenatal care (ANC) visits due to the financial burden associated with healthcare services. Regarding obstetric profiles, parity exceeding five emerged as a risk factor for intrauterine fetal death (IUFD), consistent with findings from other studies [19,20]. This association is explained by the advanced maternal age associated with multiparity, which increases the likelihood of fetal malformations and chronic pathologies, as well as complications like placental abruption, compromising placental perfusion. Interestingly, a history of spontaneous abortion emerged as a protective factor against IUFD in our study. This phenomenon may be attributed to heightened vigilance and adherence to preventive measures among women who have experienced previous pregnancy losses. In our study, IUFD was observed in 18.2% of cases, consistent with findings from another study reporting an 8.8% incidence [17]. Furthermore, hypertension emerged as a significant risk factor for IUFD in our study, consistent with prior research [11,12,17,21,22]. Hypertensive disorders double the risk of IUFD due to placental insufficiency and the increased frequency of retroplacental hematomas, compromising fetal perfusion. Anemia was prevalent among our study population, with 63.60% exhibiting hemoglobin levels of 8-10 gm/dl and 9.10% having levels below 8 gm/dl, indicative of mild anemia in 78.04% of cases. These findings are consistent with other studies reporting varying degrees of anemia [25,26]. Regarding gestational age, stillbirths were most common beyond 36 weeks of gestation (37%), followed by 28-32 weeks (36%), consistent with Mufti *et al.,*'s findings [14]. IUFD was more common among preterm fetuses in our study, resulting in a majority of low-birth-weight babies, as observed in other studies [12]. Maternal factors, such as pre-eclampsia and premature rupture of membranes (PROM), were strongly associated with IUFD in our study (45.45%), consistent with findings from Kumari *et al.,* (30%) and Lucy *et al.,* (32.8%). Fetal and cord-related factors were also implicated in IUFD, as demonstrated in various research studies [14,25,26]. A considerable proportion of IUFD cases in our study remained unexplained (9.09%), highlighting a persistent challenge for obstetricians. However, a significant portion of IUFD cases could be prevented through patient education, awareness of warning signs, regular antenatal visits, and early referrals.

Limitations of the study: The study's retrospective design limits its ability to establish causal relationships between identified risk factors and IUFD. Additionally, the study's scope is confined to a single healthcare facility in Gaibandha, Bangladesh, potentially overlooking regional variations and broader population trends. Moreover, reliance on medical records for data collection introduces the possibility of incomplete or inaccurate information, impacting the study's reliability. Finally, the study's sample size of 75 participants may not adequately represent the diverse factors influencing IUFD, necessitating larger-scale studies for more robust conclusions.

CONCLUSION AND RECOMMENDATIONS

In conclusion, this cross-sectional study shed light on the multifaceted nature of intrauterine fetal death (IUFD) and its associated risk factors in Gaibandha, Bangladesh. The findings underscored the significant impact of maternal, fetal, and socio-demographic variables on IUFD incidence. Maternal factors such as hypertension and pre-eclampsia emerged as significant contributors, alongside fetal and cord-related issues. Moreover, socio-economic disparities and inadequate antenatal care underscored the importance of holistic healthcare interventions to mitigate IUFD risks. Despite advancements in prenatal care, a notable proportion of IUFD cases remain unexplained, highlighting the need for continued research and comprehensive preventive strategies.

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