



STUDY OF INTRAUTERINE FETAL DEATH (IUFD) A 3 YEARS RETROSPECTIVE STUDY

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ABSTRACT **Introduction-** Intrauterine fetal death (IUFD) is always a massive psycho-affective trauma for a woman and a couple. The investigation for the cause is essential for improving care by implementing preventative measures. Therefore, this study aimed to assess the major causes of stillbirth. **Methods-** The study was conducted at a tertiary care hospital in Kolhapur at D.Y PATIL HOSPITAL. The hospital records of intrauterine fetal death between clinical duration January 2018 to December 2020 were collected and reviewed and a total of 70 cases with pregnancies of > 28weeks of gestation age, foetus weighing >1000grams and singleton pregnancies were included. Detailed clinical history, examination and laboratory investigations reports were reviewed to analyse the data. In this study Demographics and clinical data were analysed using R-studio software (v.1.2.5001). **Result-** Of the 70 cases, high number of women who experienced stillbirth belonged to the age group of 25-30 years (48.57%), had multigravida (70%), female baby (52.86%), term baby (58.57%). Maternal factors causing stillbirths were evident 62.86% of cases. Hypertensive disorder (25.71%), COVID- 19 positive (10%), congenital anomaly (1.43%) were the commonest maternal, placental and fetal causes of fetal death respectively. **Conclusion-** Maternal and placental causes are more commonly resulting in an increased risk of stillbirth. Therefore, health care professionals should identify risk factors in order to prevent stillbirths.

KEYWORDS : COVID-19, Fetal death, placenta, pregnancy induced hypertension, Stillbirth.

INTRODUCTION

Intrauterine foetal death is always a massive psycho-affective trauma for a woman and a couple^[1] It is a crucial indicator of a country's health and progress. Stillbirth is defined by the WHO as a baby delivered without signs of life at or after 28 weeks of gestation.^[2] Annually, around 2.6 million stillbirths occur worldwide, with 98 percent occurring in low- and middle-income countries (LMICs).^[3] Stillbirth rates vary widely by country, ranging from 5 per 1000 births in high-income countries to 36 per 1000 births in low-income ones.^[3] In 2015, it was 18.4 per 1000 births worldwide^[2] Stillbirths can be attributed to various of factors, including maternal diabetes, hypertensive diseases, intrauterine sepsis, and foetal growth limitation. According to WHO estimates, half of all stillbirths (1.3 million) occur during labour and delivery, with the majority of them attributable to preventable causes.^[2] The lack of uniformity in the definition of foetal mortality or stillbirth, makes it impossible to compare incidences across populations and effectively determine the scope of the problem. Another major challenge to a thorough assessment of this phenomenon is the difficulty in determining the underlying aetiology, which can be attributed to one of three factors: maternal, placental, or foetal. When attempting to determine the actual aetiology, these factors often interact with one another, providing space for subjective interpretation.^[4]

Therefore, this study is aimed to find the causes of stillbirth and help in reducing the prevalence of stillbirth.

METHODOLOGY

Study Design, Setting And Population

The single centre retrospective study analysis was conducted at department of obstetrics and gynecology at a tertiary health care centre at Dr. D.Y. Patil Medical College Hospital and Research Institute, at Kolhapur, Maharashtra. The hospital records of intrauterine fetal death between January 2018 to December 2020 were collected and reviewed. A total of 70 case records were reviewed. The study was approved by institutional ethics committee and written consent from the patients was obtained prior to the study.

The records with pregnancies above 28weeks of gestation, fetus weighing 1000grams or more and singleton pregnancies were included. Whereas, the records with twin and triplet pregnancies, pregnancy below 28weeks gestation and fetus weighing less than 1000grams were excluded.

Study Procedure

This is a single centre retrospective study of intrauterine fetal death and associated maternal conditions. The details are entered in a preformed proforma. The details of complaints at admission, obstetric history, menstrual history, examination findings, per vaginal examination findings, mode of delivery and fetal outcomes, placental examination, conditions of the cord and investigations reports are recorded. The records of babies born below 28 weeks of gestation and fetus weighing below 1000gms and twin pregnancies are excluded. The complaints include period of amenorrhea, duration of labour pains, history of leaking pv, bleeding per vaginum, PIH, eclampsia, decreased or loss of fetal movements. The obstetric history included parity, abortion, still births, neonatal deaths, preterm delivery, antepartum hemorrhage or PIH in a previous pregnancy. The records of per vaginal findings include bleeding PV, dilatation of cervix, effacement of cervix, presenting part, membranes, pelvis, hand prolapse or cord prolapse. The details of mode of delivery include vaginal delivery, LSCS, forceps. Fetal outcomes recorded include fresh or macerated still birth, sex of the baby, weight, congenital malformations and birth injuries. Findings of placenta like infarction, calcification and retroplacental clot and conditions of the cord like knots, cord around neck and any other abnormality are also recorded.

Statistical Analyses

Data collected were organised in MS- Excel 2016 and analysed using R-studio software (v.1.2.5001).

RESULTS-

High number of women who experienced stillbirth belonged to the age group of 25-30 years (n=34; 45.57%), had multigravida (n=49; 70%), female baby (n=37; 52.86%), term baby (n=41; 58.57%) (Table 1).

Table 1: Frequency Distribution Of Age.

Variables	Frequency (n)	Percentage (%)
Age		
19-24	29	41.43%
25-30	34	48.57%
31-36	05	7.14%
37-42	02	2.86%
Diagnosis		
Multi Gravida	49	70.00%
Primi Gravida	21	30.00%

Baby Sex		
Female	37	52.86%
Male	33	47.14%
Term/Preterm		
Term	41	58.57%
Preterm	29	41.43%

Maternal factors causing stillbirths were evident in 44 (62.86%) of cases, followed by placental factors in 25 (35.71%) cases and fetal factors in one that is congenital Anomaly (1.43%) case (Figure 1).

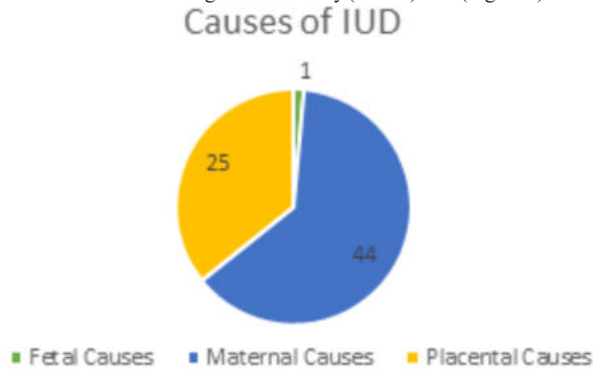


Figure 1: Causes Of IUD

Maternal and placental causes are represented in figure 2 and 3 respectively. Furthermore, congenital anomaly (fetal cause) was evident in 1.43% cases.

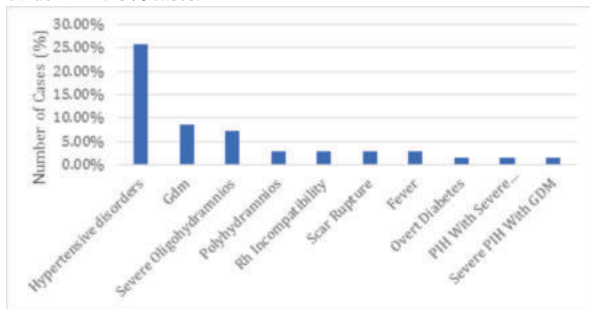


Figure 2: Distribution Of Maternal Causes

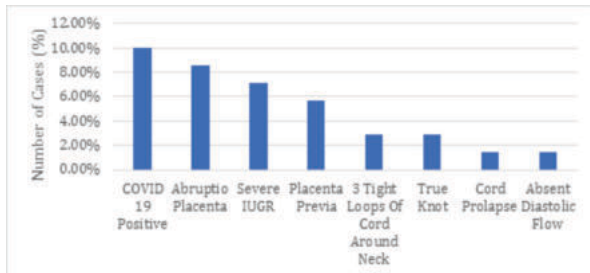


Figure 3: Distribution of Placental Causes

Table 2 depicts the mean and standard deviation of the characters under study.

Table 2: Analysis Of Mean And Standard Deviation For Character Under Study.

Variable	Mean ± SD
Age (Years)	25.69 ± 4.34
IUD Weight (Kilograms)	1.87 ± 0.78
Systolic Blood Pressure (mm Hg)	137.29 ± 32.56
Diastolic Blood Pressure (mm Hg)	88.43 ± 21.24

DISCUSSION

Childbirth complications, maternal infections in pregnancy, maternal conditions, particularly hypertension, foetal growth restriction, and congenital abnormalities should all be addressed to reduce the global incidence of stillbirth. It is hypothesised that the causes of IUFD have evolved in tandem with advances in prenatal diagnosis and perinatal management. Additionally, the impact of the novel coronavirus (2019-nCoV, or SARS-CoV-2) on pregnancy and IUD has also gained huge importance during this pandemic. Therefore, understanding the causes

of stillbirths is most crucial. This study can add on to the existing data and help to plan well and decrease the chance of stillbirth in future pregnancies.

Elevated risk of IUD is common among teenage group and older women. This was evident in the present study as high number the of mothers 34 (45.57%) belonged to the age group of 25-30 years. Also, this concurs with previous studies. In the study conducted by Manocha A et al., according to author who studied placenta in intrauterine fetal demise, the pregnant women aged 18-35 years were included with the mean age of 26 years. [5] This can be attributed to the women's age during marriage. High number of women get married after the age of 23-24 years and believe to complete their family by the age of 35 years. Interestingly, Bansal M et al. reported that fetal deaths were higher in women of 21-30 years. [6] Moreover, the study of Jamal S et al. showed maximum incidence of IUFD among age group 16-20 years. [7] In this study too, 41.43% of women were aged between 19 and 24 years.

Concerning gravida, the association between gravida and IUD is still a topic of debate as there is huge discrepancy in the reports of available data. However, in this study, incidence of multigravida was higher (70%) compared to primigravida (30%). Kanavi JV et al., also reported higher incidence of multigravida in their study. [8] Contradictorily, Manocha A et al., reported higher incidence of primigravida. [5]

Previous research has found a link between fetal male gender and adverse pregnancy outcomes. Interestingly, in this study, compared to males (47.14%), stillbirth was slightly more in females babies (52.86%). had slightly more stillbirths. This can be attributed to the inclusion criteria of the study as the pregnancies only with more 28 weeks of gestational age were included. Hadar E et al. in according to their study reported the rate of stillbirth to be 0.14% with female predominance. [9] Additionally, they have also found that male stillbirths were affected by placental abruption. Hadar E et al., focused on the association between fetal gender and the occurrence and etiology of stillbirth. [9]

41 (58.57%) cases were term whereas the remaining 29 (41.43%) cases were preterm. Stunningly, contradictory results are reported in previous studies. In the study conducted by Karale A et al., of the 363 IUD cases, 76 had gestational age less than 28 weeks, 136 cases had the gestational age between 28 and 34 weeks, 64 cases had gestational age between 34 and 37 years and 40 cases had the gestational age of more than 37 weeks. [10] In the study conducted by Saha D et al., of the total 170 cases, 64 cases had the gestational age between 20 and 28 weeks followed by 46 cases between 28 and 30 weeks, 28 cases between 31 and 36 weeks, 14 cases between 37 and 38 weeks and only 18 cases had gestational age of more than 40 weeks. [11] However, the reason behind this discrepancy is not clear.

Maternal factors causing stillbirths were evident in 44 (62.86%) of cases. Followed by placental factors in 25 (35.71%) cases and fetal factors in one (1.43%) case. However, Sharma et al., also reported that maternal causes were evident in high number of cases (39.12%) and unknown causes were 19.87%. [12] Interestingly, in the study carried out by Mali R et al., the common causes of IUD were fetal causes (29.24%), followed by maternal conditions (24.56%), placental causes (16.37%), and congenital malformations (14.62%), and unknown causes (9.36%). [13]

Previous studies have reported that hypertensive disorders during pregnancy are among the leading causes of stillbirths. [14] When O'Sullivan and colleagues first identified the condition of GDM during pregnancy in the 1960s, they noticed an increased incidence of stillbirth among women with gestational diabetes who were either undiagnosed or undertreated. [15] Previous studies, and those conducted in the developing world, have also shown that GDM is associated with an increased risk of stillbirth. [16,17] Additionally, effect of oligohydramnios on adverse pregnancy outcomes has been reported in multiple studies conducted in both developed and developing countries. In a recent study by Figueroa L et al., Oligohydramnios was linked to higher rates of maternal haemorrhage, foetal malposition, and caesarean delivery than non-oligohydramnios pregnancies. Oligohydramnios was also linked to higher rates of poor fetal/neonatal outcomes, including a 5-fold increase in stillbirths and a 3-fold increase in deaths among babies under 28 days old. [18] However, this has also been reflected in our study, as hypertensive disorder, GDM and severe oligohydramnios were the three most common maternal causes.

however, studies and data to inform proper management of pregnant women and fetuses during the COVID-19 pandemic are limited. There have been several reports of poor maternal and fetal outcomes around the world, but only few studies have directly linked these outcomes to COVID-19, most likely due to poor data collection and the limited statistical power of smaller studies and observational reports available in the literature thus far.^[19] Though there is scant information on the effects of COVID-19 on foetal health and development, clinical reports of increased rates of miscarriage and stillbirth, growth restriction, and preterm births have emerged since the beginning of the pandemic^[20-22]. In recent years, the CDC has reported stillbirth rates ranging from 2.2 percent to 3 percent in multistate surveillance studies^[23-24]. This data trend is concerning when compared to the average US stillbirth rate of 1% prior to the pandemic.^[25] Since the beginning of the COVID-19 pandemic, the transmission of this virus from infected mother to fetus has been debated.^[26-29] This debate over the virus's vertical transmission has been studied in pregnant females with COVID-19 symptoms.^[26-29] However, in this study, distribution of placental causes depicts that high number of patients were COVID-19 positive (10%), followed by abruptio placenta (8.57%), Severe IUGR (7.14%), placenta previa (5.71%). However, cord around neck (2.86%), true knot (2.86%), cord prolapse (1.43%) and absent diastolic flow (1.43%) were less common.

Furthermore, congenital anomaly (congenital diaphragmatic hernia) was the only fetal cause of IUD in this study and was evident in 1.43% cases. This concurs with the previous reports which have depicted that regardless of incidental growth restriction, the stillbirth rate is higher in anomalous fetuses. Pregnancies complicated by isolated major congenital anomalies have a 15-fold increase in the risk of stillbirth. In general, one out of every 18 pregnancies complicated by a single major anomaly will result in fetal death.^[30] Congenital diaphragmatic hernia (CDH) is a common birth defect that affects 1 in 2500 to 4000 live births every year.^[31] Despite recent advances in neonatal intensive care, paediatric surgeons and intensivists continue to face challenges. Despite significant improvements in CDH patient survival rates over the last 20 years the mortality rate of this complex malformation remains high but underreported due to a 'hidden mortality' associated with infants who die before being operated on. The severity of pulmonary hypoplasia, pulmonary artery hypertension, and the presence of any associated foetal anomalies have all been identified as factors contributing to the high mortality and morbidity of CDH patients. CDH patients' management strategies have evolved drastically over time.^[31] Moreover, Sharma S et al., had conducted an analytical study concerning "Intrauterine fetal death cases and associated maternal conditions". They reported that, trauma and stress of labour was the commonest cause and was evident in 34% cases followed by pregnancy induced hypertension (19.6%), maternal medical condition (12.8%), antepartum haemorrhage (12%), congenital malformation (8%), unknown cause (5.6%), Fetal growth retardation (5.2%) and prematurity (2.8%).^[32] Pregnancy at a young age (≤ 19 years old) or older age (≥ 35 years old) is associated with elevated risk of adverse maternal perinatal outcomes, such as eclampsia, postpartum hemorrhage, and cephalopelvic disproportion, and adverse infant outcomes including preterm birth, poor fetal growth, neonatal mortality and low birth weight.^[33] Most complications are independent of crucial known confounders including inadequate prenatal care poverty, and/or weight gain during pregnancy. Lately, the studies are using current data to examine the association of maternal age with labour and delivery complications.^[33] This indeed are needed to help delineate the contributions of maternal age to IUD. These findings may help us in the management of factor causing risk during pregnancy, mostly when the signs and symptoms of complications can be monitored by the physicians and the pregnant woman. However, in this study, the mean maternal age was 25.69 ± 4.34 years and the mean weight of baby was 1.87 ± 0.78 kilograms. Furthermore, the mean systolic blood pressure and diastolic blood pressure were 137.29 ± 32.56 mmHg and 88.43 ± 21.24 mmHg respectively.

However, this study supports the previous reports concerning the causes of IUD.

Although, this study is very crucial to understand causes of stillbirth, help physicians as well as pregnant women to be aware of the risk factors and promotes early diagnosis and treatment in case of any symptoms are evident and to prevent the risk of stillbirths, there are certain limitations. Primarily, the findings of the study are limited as in

depth association of each risk factor with outcome was not studied. A relatively small sample size can be considered as the secondary limitations of this study. However, a future study with large sample size focusing on the association of each of the risk factors with outcome would provide better insight on etiologies.

CONCLUSION

Maternal and placental causes are more commonly resulting in an increased risk of stillbirth. Therefore, health care professionals should identify the causative factors & treat them to prevent stillbirth in every woman of childbearing age as soon as possible.

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