

A Study of Intrauterine Foetal Death Cases and Associated Maternal Condition: A Retrospective Study in a Tertiary Care Centre in India

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Abstract: Background: To identify the risk factors and to streamline preventive and management protocols for IUD. **Methods:** This was a retrospective study from Nov. 2018 to June 2021 which was conducted at Sharda hospital Greater Noida India. IUD was defined as fetal death beyond 20 weeks of gestation and/or birth weight >500g. Maternal and fetal records were analysed. Mode of delivery and associated complications were studied. **Results:** Total number of deliveries were 2514. Incidence of IUD at our centre was 5.09%. (128/2514). In 15.62% cases, no causes were identified. Among the identifiable causes, Placental abruption (12.5%), PROM (10.16%) hypertensive disorders (9.37%) anaemia (7.81%) were most common. **Conclusions:** The present study is an effort to compile a profile of maternal, fetal and placental causes culminating to IUD at our centre. This emphasizes the importance of proper antenatal care and identification of risk factors and its treatment. Institutional deliveries should be promoted to prevent intrapartum fetal deaths. A substantial number of IUD are still labelled as unexplained, hence cannot be prevented. Decrease in the incidence of IUD would significantly reduce the perinatal mortality exclusion criteria gestational age less than 24 weeks.

Keywords: Intrauterine fetal death (IUD), Unexplained fetal death, Disseminated intravascular coagulation.

1. Introduction

Foetal demise or death as defined by WHO in 1950 and revised by the working group formed by the 11th American Academy of paediatrics and ACOG in 1988 is death prior to complete expulsion or extraction from its mother of a product of human conception irrespective of the duration of pregnancy which is not an induced termination of pregnancy.[1] Late foetal death is those which occur at 28 or more completed weeks of gestation. According to the International Classification of Diseases, revision 10 (ICD -10) [2], an early foetal death weighing at least 500 grams (or if birth weight is unavailable then after 22 weeks gestation or crown-heel length ≥ 25 cms) and a late foetal death is defined as death of a foetus weighing at least 1000 grams (or gestational age 28 weeks or a crown-heel length of ≥ 35 cms). In many countries particularly in the developing world, intrauterine foetal death (IUFD) is calculated on the basis of deaths at 28 or more weeks of gestation or weight of 1000 gms or more.[3] Death of a foetus is really distressing when it occurs without warning in a

pregnancy that has previously seemed entirely normal. It is an event that challenges both the medical and personal skill of the doctor. It is thus very essential to identify specific probable causes of foetal death to determine the risk of recurrence, prevention or corrective action. For an obstetrician, documentation of primary event or factor which has led to foetal death is a paramount importance.

Only when probable aetiology of foetal death is known the patient can be given proper guidance for its treatment, prevention and recurrence if necessary. Still birth generally accounts for half of all perinatal mortality, with an estimated 4 million occurring worldwide each year. More than 98% of these stillbirths take place in developing countries [4] For many reasons still birth have been understudied, underreported and rarely have been considered in attempts to improve adverse pregnancy outcome in developing countries.[5] Perinatal mortality reflects one of the important health indexes of a country and it is one of the sensitive indicators of maternal and child health (MCH) care.

Nearly 60% of perinatal deaths in our country are stillbirths and are preventable to a greater extent.[6] Stillbirths are difficult to prevent unlike early neonatal death, because all the risk factors have not been adequately identified. Despite improvement in antenatal care and intrapartum care, stillbirths remain an important, largely unstudied, and major problem in obstetrics worldwide, especially in developing country like India. Although the overall perinatal mortality rate has fallen in the past several decades, the incidence of stillbirth in developing countries varies from 1.5 to 2.2 %. In India still births rate is as high as 100/1000 births in some regions.[7] Now India is a leading contributor of stillbirth and recent lancet study suggests that nearly one fourth of all stillbirths are from India.[8]

Since many attempts have been made to lower the death of newborn babies with the help of rapidly advancing intensive neonatal care unit, neonatal death rate is reduced in developed countries. A small reduction in perinatal mortality rate is due to reduction in the infant mortality rate and not because of foetal mortality. So, attention is now drawn towards the unborn in utero to deliver a healthy baby and so that perinatal mortality can be further reduced. The present study was planned to

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determine the characteristics of IUD, and a critical analysis of the risk factors associated with it for implementation of preventive measures.

Fetal death is an obstetric death accounting for approximately half of perinatal death. Stillbirth is an event which has always challenged the obstetricians. The mode of antenatal care has changed in past 50 years. The mode of antepartum and intrapartum surveillance for fetal wellbeing has advanced in last few decades. There are so many maternal conditions and diseases that are responsible for poor obstetrical outcomes. Stillbirth is a useful index to measure the values of antenatal and intranatal care. By proper antenatal check-ups, the high-risk cases associated with poor outcomes can be identified. The aim of this study was to analyze the maternal conditions associated with fetal death with specific reference to clinical presentations, fetal, and maternal complications and to find the preventable causes of fetal death.

2. Methods

This was a retrospective study from Nov 2018 to June 2021 which was conducted at Sharda hospital Greater Noida India. Total number of deliveries during this period was 2514. Among this, total number of IUD were 128. Records were thoroughly analysed with respect to age, parity, gestational age, associated complicating factors like hypertensive disorders of pregnancy, diabetes, Rh isoimmunization, anaemia, history of IUD in previous pregnancy. Fetal characteristics were studied with respect to sex, birth weight, gross congenital anomalies.

3. Results

We observed that 29.69% patients of IUDs were primipara and 70.31% patients were multipara. It was observed that (44.54%) of total IUDs were more than 34 weeks whereas less than 34 weeks intra-uterine deaths accounted for 55.46% of

total IUDs. It was observed that 25% of dead fetus weighed from 0.5 to 1.00 kg, 48.44% weighed from 1.00 to 2.5 kg, 26.56% weighed more than 2.5 kg. Among the IUD fetuses, female sex was found to be significantly higher (53.12%) as compared to male sex (46.88%). In our study 69.53% fetuses were non macerated as compared to 30.47% macerated foetuses.

4. Discussion

Six instances (4.69 percent) were booked out of a total of 128 cases, while the remaining cases remained unbooked (95.31 percent). This was seen since our centre is a tertiary care centre where patients with similar problems were referred from other centres, and the majority of the patients were unbooked and did not get any prenatal care. The bulk of the women in our research were between the ages of 20 and 30. IUDs were often caused by placental abruption. Intrauterine foetal mortality in the past suggests a subclinical genetic or chromosomal issue that may occur in future pregnancies. In our research, prior IUD use was observed in 11.71 percent of the cases. In our study, neural tube abnormalities identified as the most common congenital abnormality linked to IUD. It's possible that this is related to a lack of folic acid supplementation throughout the periconceptional phase.

In our research, Rh isoimmunization was found in 3.90 percent of IUD.

Obstructed labour leading to IUD was a frequent intrapartum complication in our research (7.03 percent). In industrialised nations, they are uncommon. This is attributable to patients' lack of knowledge and a poorly prepared health-care delivery system at the grassroots level. The growing use of necropsy in western nations has dramatically decreased the incidence of unexplained stillbirths. In our study, the lack of necropsy severely hampered diagnosis accuracy. The incidence of iudf is

Table 1
Data analysis

Maternal characteristics		Frequency	Percent	p value
	<20	3	2.34	
Maternal Age in Years	20-30	92	71.88	<0.001
	>30	33	25.78	
Antenatal Visits	Booked	03	2.34	0.035
	Unbooked	125	97.65	
Parity Group	Primi	38	29.68	0.035
	Multi	90	70.31	
Consanguinity	yes	0	0	0.045
	no	100	100	
Gestational Age in Weeks	<28 weeks	28	21.87	0.045
	28-34	43	33.59	
	>34	57	44.53	
Baby Sex	Boy	60	46.87	0.001
	Girl	68	53.13	
Signs of Maceration	Absent	89	69.53	0.004
	Present	39	30.47	
Mode of Delivery	Vaginal	104	81.25	0.004
	Caesarean delivery	24	18.75	

Table 2
Maternal age

Maternal age in years	No. of live birth	No. of IUD	IUD per 1000 live birth	P value
<20	71	03	42.25	0.003
20-30	1845	92	49.86	0.043
30-40	470	33	70.21	0.032

higher in our study due to our centre being a tertiary care referral hospital. Most of the cases would be referred from all over the state and also from neighbouring two states. 90% of the cases were referred from outside.

The incidence was higher in lesser gestational age group compared to higher gestational age and in our centre the obstetric care is divided into high risk and low risk prenatal care. In low-risk group, all the pregnant women will be called once in 4weeks till 28weeks, once in 2weeks between 28weeks to 37weeks. Every visit weight gain and blood pressure is recorded, will be also provided with calcium, folic acid and oral iron supplements. Every pregnant woman will be screened for GDM between 24 to 28weeks. Screening for anaemia is done at first visit, 32weeks, and 36weeks. Regular nuchal translucency scan at 13weeks and anomaly scan is done between 20-22weeks of gestation. After 37weeks they are followed every week with ultrasound evaluation of amniotic fluid evaluation and non-stress test. Beyond 40 weeks of gestation, if there are no signs of onset of labour, they will be admitted, and induction of labour will be initiated.

In high-risk pregnancies, more frequent visits are advised with an intense monitoring of growth of the foetus with ultrasound and Doppler. Multi department approach is offered to pregnant women with other associated systemic diseases.

Most of the causes of IUD in our study were preventable. When a pregnant lady is detected to have pre-eclampsia, which is the most common cause in our study, she should be treated aggressively with adequate control of blood pressure and close monitoring of other parameters like foetal growth, liver, and renal function tests along with coagulation profile. This makes it more pertinent to smaller centres in India to identify pre-eclampsia in its early stages and keep the threshold lower to refer to an appropriate centre. Timely decision for delivery should be taken to avoid the associated complications in general and specifically IUD.

A large portion of our study group had anaemia, indicating that proper precautions should be taken to prevent and also treat anaemia early in the pregnancy. This will avoid complications associated with anaemia especially pre-eclampsia, morbidity and mortality associated with anaemia and pregnancy.

To summarise the results which can have implications on preventing IUD in India, in rural and peripheral centres where antenatal care is provided, health care personnel should be trained to identify the pregnancy as high risk or low risk. The proper risk stratification will help to reduce the complications of high-risk pregnancy including early detection of pre-eclampsia, anaemia, GDM, previous pregnancy loss. This will aid timely referral to a higher centre.

Table 3
P-value using by Fisher's exact test

Gestational age in weeks	No. of live birth	No. of IUD	IUD per 1000 live birth	P value
<28	31	28	903.2	0.013
28-34	284	43	151.4	0.023
>34	2071	57	27.52	0.032

Table 4
Risk factors

Risk factors	Number of cases	Percentage
Unknown	20	15.62
Abruptio placentae	16	12.50
Premature rupture of membrane	13	10.16
Hypertensive disorders	12	9.37
Anaemia	10	7.81
Medical causes	10	7.81
Oligohydramnios	07	5.47
Congenital anomalies	07	5.47
Cord loop	07	5.47
Obstructed labour	06	4.69
Rh negative pregnancy	05	3.90
Uterine rupture	04	3.12
Meconium stained liquor	03	2.34
Gestational diabetes	03	2.34
Placenta previa	01	0.78
Hypothyroidism	01	0.78
Cholestasis of pregnancy	01	0.78
Post term	01	0.78
Vaginal breech delivery	01	0.78

Table 5
Comparison between Parity

	Live birth	IUD	Total deliveries	p-value	OR	95% CI
Primi	790(95.41%)	38(4.59%)	828			
Parity						
Multi	1596(94.66%)	90(5.33%)	1686	0.023		
Total	2386(94.9%)	128(5.1%)	2514	.03		

*P-value statistically significant at level by using chi-square test

As the gestational age reduced, the incidence of IUD raised, it was highest at gestation less than 28weeks, 52.8/1000 live births. There was no significant difference between parity.

5. Conclusion

The goal of counting IUDs is to learn more about the variables that contribute to recurrence and to find methods to prevent it via appropriate prenatal care, early detection of problems, and effective treatment. To evaluate mother health and identify the reason of death, the risk of recurrence, and the likelihood of preventing future pregnancy problems, clinical examination and evaluation is suggested. Intrauterine foetal mortality may be prevented by modifying maternal risk factors such as hypertension, severe anaemia, and diabetes management. Ultrasound examination throughout the first and second trimesters may help rule out congenital abnormalities and placental problems, both of which are linked to intrauterine foetal mortality.

IUFD may be avoided with better intrapartum foetal monitoring in high-risk situations. To summarise, the linked risk factors in our community seem to be avoidable. Health education should be prioritised, with a focus on prenatal care and the benefits of frequent attendance, a better periconceptional environment, diet, and micronutrient status, particularly iron and folic acid consumption. The early detection of high-risk patients and subsequent referral to higher centres may save the baby's life. Patient compliance is critical in minimising the majority of these avoidable foetal deaths.

In their future pregnancy, women with a history of IUFD should go to a consultant-led hospital-based prenatal clinic and have their antenatal monitoring enhanced. Future research should concentrate on improving clinical methods for assessing foetal well-being and identifying pathophysiological mechanisms that contribute to stillbirth due to maternal illness. Parents have the greatest interest in their child's health and must participate in the effort to prevent stillbirths. The goal of this research was to find out how often IUFD is and what variables contribute to it. We may explore methods to prevent recurrence by providing appropriate prenatal care and early identification and treatment of problems by knowing the relevant variables. Prenatal screening for anaemia, preeclampsia, gestational diabetes mellitus, prior pregnancy loss, and antenatal monitoring may all help to reduce the risk of IUFD. The risks of IUFD recurrence may be minimised, and additional pregnancy problems can be avoided, if the source of IUFD can be identified. Stillbirth rates may be reduced significantly with proper screening and prenatal care. As this research found, the causes of stillbirth and IUFD are complex, and the majority of them are avoidable. Preconception counselling and care, early detection of maternal and foetal complications (e.g., PIH, foetal anomaly), confirmation of foetal growth retardation, hypoxia,

and foetal distress, a well-organized referral system for difficult deliveries, and prompt detection and intervention of intrapartum complications, according to the authors, can all help to address the problem to a large extent. For the prevention of stillbirth, a multidisciplinary strategy including an obstetrician, a foetal medicine expert, a radiologist, and an anaesthesiologist may be used. Patient education, careful planning of midwives visits to pregnant women, more frequent visits for high-risk pregnancies, and prompt referral to specialists will all help to reduce tragic wastage. As a result, increasing people's overall well-being, including their education, and making emergency transportation services accessible in outlying areas may help to reduce stillbirths.

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