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**Original Research Article**

# A study of intrauterine fetal death in a tertiary care hospital

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## ABSTRACT

**Background:** Intrauterine fetal death is a major obstetrical complication and a devastating experience for parents as well as obstetricians. If the causes of IUFD can be found, an effective strategy for prevention of IUFD can be formed and maternal complications can thus be prevented. This study aims at identifying the various causes, etiological factors and complications of IUFD.
**Methods:** Prospective observational study was carried out in a tertiary care hospital from 1st January 2016 to 31st July 2017.
**Results:** Total number of deliveries during the study period was 3944 and still birth was 170. Still birth percentage was 4.31.Majority of patient belonged to maternal age group of 21-30 year of age that is 138 out of 170 around 68.5%. Only 8.82% of patients presenting with IUFD were having more than three antenatal visits. Among 61 cases (35.8%) cause was not identified while 109 cases cause was identified. Hypertensive disorder contributed to major cause of IUFD i.e. 34 out of 170 (20%) Maternal complications like hypovolemic shock occurred in 13 out of 170 (7.6%), Acute Renal failure 7 out of 170 (4.11), Sheehan syndrome. Maternal mortality was 3 out of 170 cases.
**Conclusions:** Despite availability of modern interventions like ultrasonography, Non stress test, majority of the causes of IUFD remains unknown. Early diagnosis and delivery is important in cases of IUFD to prevent various complications like septicaemia, acute renal failure, DIC, hypovolemic shock etc.

**Keywords:** Acute renal failure, Disseminated intravascular coagulation, Diabetic ketoacidosis, Intrauterine fetal demise

## INTRODUCTION

The CDC definition of "fetal death" is based on the definition promulgated by the WHO in 1950. It defines "fetal death" as death prior to the complete expulsion from its mother of a product of human conception, irrespective of the duration of pregnancy and which is not an induced termination of pregnancy.[1] The American College of Obstetricians and Gynaecologists defines fetal demise as death of a fetus past 20 weeks of gestation and or weight of 500grams and above.[2] The incidence of IUFD is estimated to be 3 per 1000 pregnancies in developed countries and as high as 45 per 1000 pregnancies in developing countries. Fetal death, the largest subgroup of perinatal mortality worldwide consists of antepartum and intrapartum fetal deaths. The causes of fetal death include: fetal causes (25-40%), placental causes (25-35%), maternal causes (5-10%) and in 25-35% of cases the cause remains unknown. The maternal risk factors associated with intrauterine fetal death can be enlisted as antiphospholipid antibody syndrome, isoimmunisation, hypertensive disorders, cholestasis, vascular diseases, infections, cyanotic heart disease, severe anaemia. The fetal factors include

congenital anomaly, postmaturity, coagulation disorders, fetal growth restriction and chromosomal abnormalities. Placental causes of intrauterine fetal demise include abruption, cord abnormalities, true knots in cord. Apart from serious maternal complications like placental abruption haemorrhage, disseminated intravascular coagulation, shock, septicaemia, there may be tremendous impact on the psychological status of the mother commonly depression and postpartum psychosis. Families with identified genetic conditions may be counselled about reproductive options including antenatal and preimplantation genetic diagnosis. Counselling regarding smoking cessation, weight loss in obese women may also reduce stillbirths. Antenatal surveillance is widely recommended for subsequent pregnancies for patients with prior fetal death. However, with newer advances like color doppler, fetal karyotying, placental evaluation, good antenatal screening it is possible to make a significant decline in the number of Intrauterine fetal deaths.

## METHODS

Total 170 cases of IUFD were taken as study population and study was conducted in tertiary care hospital in Mumbai, Maharashtra, India.

This was a Prospective observational study was carried on between from January 2016 to May 2017 at a tertiary care center.

### *Procedure*

Structured questions were used for collecting data of maternal demographic characteristics, past medical and obstetric history. All the patients with IUFD were admitted, confirmation of IUFD and cause assessment of IUFD was done by ultrasonography. Based on clinical and pelvic examination induction of labor and mode of delivery was decided. A detailed partogram was maintained and post delivery placenta was sent for histopathology. Post delivery complications were noted. Patient was followed up post delivery along with counseling of patient regarding cause of IUFD and appropriate measure need to be taken to prevent further IUFD.

### *Inclusion criteria*

- All diagnosed cases of IUFD of more than 20 weeks of gestation.

### *Exclusion criteria*

- All abortions were excluded.

## RESULTS

As shown in Table 1 most common age group associated with intra uterine fetal demise was 21-25 year. Around 68 out of 170 patients with IUFD belonged to this age group while 11.17% of patients were of 16-20 years age group. 50 out of 170 patients with IUFD were of 26-30 year of age group i.e. 29%. 12.38% of patient with IUFD were of age group 31-35 year of age. And 11 out of 170 patients with IUFD were of age group more than 36 year of age.

**Table 1: Maternal age and IUFD.**

| Maternal age | No of patients | Percentage |
|---|---|---|
| Upto 15 year | 1 | 0.58 |
| 16-20 year | 19 | 11.17 |
| 21-25 year | 68 | 40 |
| 26-30 year | 50 | 29 |
| 31-35 year | 21 | 12.38 |
| 36-40 year | 9 | 5.2 |
| >40 year | 2 | 1.2 |

**Table 2: Gravidity of patient and intrauterine fetal demise correlation.**

| Gravidity | No. of patients | % of patients |
|---|---|---|
| Primigravida | 61 | 35.8 |
| Multigravida | 109 | 64.11 |
| Total | 170 | 100 |

As per Table 2 majority of patient presenting with intrauterine fetal demise were multigravida (64%) that is 109 patients out of 170 were while 61(35.8%) patient were primigravida thus indicating that IUFD is more common in multigravida.

**Table 3: Number of antenatal visits and IUFD.**

| Number of ANC visit | Number of patient | % |
|---|---|---|
| No visit | 45 | 26.47 |
| Single visit | 48 | 28.23 |
| Two visits | 34 | 20 |
| Three visits | 28 | 16.47 |
| More than three visits | 15 | 8.82 |

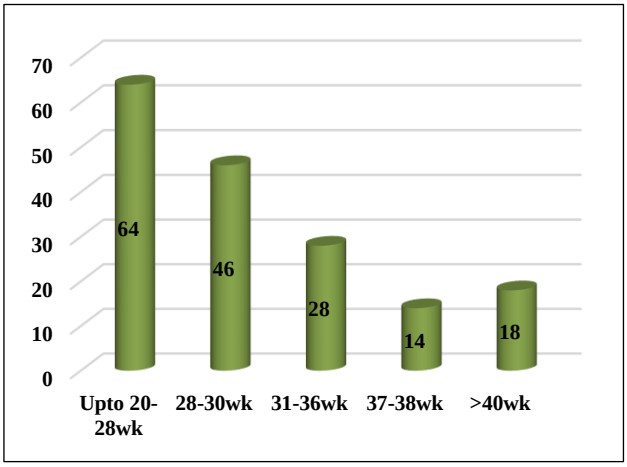


**Figure 1: Correlation between gestational age and risk of IUFD.**

Table 3 Maximum numbers of people had no antenatal visit around 38% while 26% of patient had single visit and only 9% of patient had more than three visit indicating incidence of IUFD decreases with increasing number of antenatal visit.

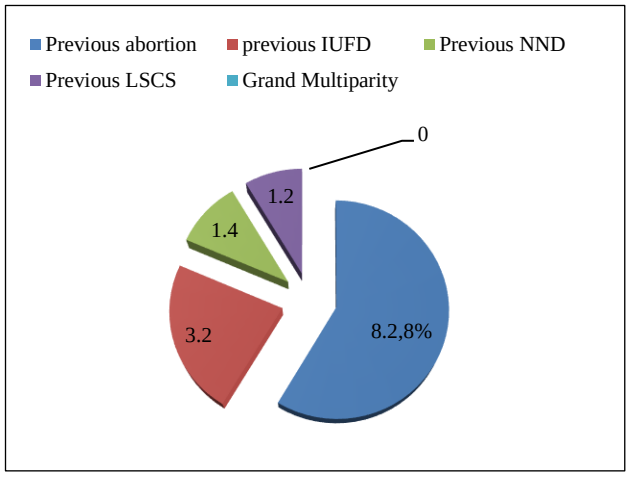


**Figure 2: Obstetric factors in relation with intrauterine fetal demise.**

As depicted in bar diagram 1 majority of patients belonged to gestational age of less than 30 weeks around 110 out of 170 patients which constitutes 65%. Around 32 out of 170 patients were of full term gestation. 28 out of 170 patients were of 31-36wk of gestational age. 18 out 170 patients with IUFD were post dated.

About 14 patients out of 170 (8.23%) had previous history of abortion, while 19 out of 170 patients around 11.1% had previous history of intrauterine fetal demise as depicted in pie diagram.[1] Other risk factors such as previous history of IUFD was seen in 3.2% of patient with IUFD, 1.4% of patient with NND had previous neonatal death, while 1.2 percent of people had previous history of lower segment caesarean section.

**Table 4: Mode of delivery in case of intrauterine fetal demise.**

| Mode of delivery | LSCS | Vaginal |
|---|---|---|
| Number | 25 | 145 |
| Percentage | 14.7 | 85.29 |

Majority of patient delivered vaginally i.e 145 out of 170 (86%). Indication for caesarean section was previous cesarean section with induction failure in 7cases and previous cesarean section with severe abruption placenta in 10, previous 2 cesarean section in 4 cases. Hysterotomy was done in 1 case of previous 3 cesarean section and 2 cases were induction failure.

As shown in Table 5 majority of the causes of intrauterine fetal demise were not known which is around 36% and 61 out of 170 patients cause of IUFD as not known. Hypertensive disorder in pregnancy accounts to 20% of IUFD, 34 out of 170. APH was also a major cause of IUFD which includes placenta previa and abruption.

Abruption was seen in 20 out of 170 patients (11.76%) whereas placenta previa was seen in 2 out of 170 cases. Severe IUGR was seen in 14 out of 170 patients round 8.23% while 26 out of 170 patients had anomalous baby which was documented on ultrasonography.

**Table 5: Different causes of intrauterine fetal death.**

| Sr. no. | Causes | Number | % |
|---|---|---|---|
| 1 | Cause not known | 61 | 35.88 |
| 2 | Diabetes | 2 | 1.17 |
| 3 | Anomalous baby | 26 | 15.9 |
| 4 | Severe IUGR | 14 | 8.23 |
| 5 | Placenta previa | 2 | 1.17 |
| 6 | Abruptio placentae | 20 | 11.76 |
| 7 | Cord around neck | 6 | 3.52 |
| 8 | Cord accidents | 3 | 1.76 |
| 9 | Hypertensive disorder | 34 | 20 |
| 10 | Others | 2 | 1.76 |

**Table 6: Maternal complications in case of intra uterine fetal demise.**

| Complication | Number | Percentage |
|---|---|---|
| Acute renal failure | 7 | 4.11 |
| Hypovolemic shock | 13 | 7.6 |
| Pulmonary edema | 5 | 2.94 |
| Cerebral edema | 3 | 1.76 |
| Disseminated Intravascular coagulation | 9 | 5.29 |
| Diabetic ketoacidosis | 2 | 1.1 |
| Hepatitis | 1 | 0.58 |
| Sheehan syndrome | 1 | 0.58 |
| Total | 41 | 24 |

As per Table 6, 41 out of 170 had developed complication that is around 24% of total cases, majority of patients had hypovolemic shock due to blood loss around 8 % followed by DIC in 5% cases followed by acute renal failure (4%).

Other complications seen were pulmonary edema in 5 out of 170 cases, cerebral edema in 1.76% cases, diabetic ketoacidosis in 2 out of 170 cases, hepatitis and Sheehan syndrome in one case each.

***Maternal mortality in intrauterine fetal demise***

Out of 170 patients, 41 that are 24% of total patient developed various complications and out 41 pt 3 patients succumbed to complication amounting to maternal mortality of 3 out of 170 patients that is 1.7%.

## DISCUSSION

The American College of Obstetricians and Gynecologists defines fetal demise as death of a fetus past 20 weeks of gestation and or weight of 500grams and above.[2] Worldwide, the stillbirth rate (SBR) has declined from 22.1 stillbirths per 1000 births in 1995 to 18.9 stillbirths per 1000 births in 2009.4 During the study period there were 170 IUFD out of 3944 total birth hence proportion of IUFD in our study (>20 weeks) was 43 per 1000 total birth, but as per WHO criteria (>28 weeks) SBR in our study was 22.2 which was same as SBR of India, that is 22.2. Lack of inadequate antenatal care (ANC) is the most important problem that needs urgent attention. If patient is given adequate ANC then complication like anemia, PIH etc. can be diagnosed at an earlier stage and can be managed. So, IUFD due to these causes can be prevented.[3] It is a well-established fact that adequate AN Care is associated with better pregnancy outcome. Al Kadri et al. found that women who did not receive ANC are at 70% risk of IUFD, which is clearly indicated from our study that only 15 out of 170(8.82%) patients with IUFD had more than three antenatal visits.[4]

In present study as shown in Table 1, 20 (11.7%) were 19 years of age, 68 (40.2%) were between age of 21-25 years, and elderly primi 9 (6.2%). Showghy et al, stated that pregnancy at the age of 16 years and less than 16 years increases the IUFD risk factor by 4 times.[5] Frett et al, has concluded that age of 35 and more can increase risk of fetal death by 1.5 times.[6]

The parity of the patient influences the pregnancy outcome. In present study proportion of IUFD was higher in multigravida 109 (61%). Korde-NV et al, observed 51.6% of multigravida who had stillbirths.[7]

In our study, 19 (11.23%) had a past history of reproductive loss in the form of abortion 14 (16.2%) and history of IUFD 19 (11.2%). Past obstetric history of pregnancy loss has chances of recurrence if the previous loss is due to Antiphospholipid Antibody Syndrome (APS).[8] Diagnosed case of APS should treated with low dose of aspirin and low molecular weight heparin, as APS is responsible for recurrent early first trimester abortion early onset severe pre-eclampsia and severe placental insufficiency resulting in premature delivery or IUFD. Prematurity and Intra Uterine Growth Restriction (IUGR) is another risk factor for fetal death. In present study, 110 (64.5%) were between 25-30 weeks of gestational age. Chitra K et al. reported 57.8% of IUFD who were preterm.[9] Pregnancy losses associated with placental insufficiency and preterm labor are more likely to recur.[10] In the present study, Hypertensive disorder of pregnancy PIH and eclampsia together accounted for 34 (20.7%) cases of IUFD. Abruptio placenta due to PIH accounted for 20 (11.76%). In present study, unexplained IUFD occurred in 61 (35.88%) compared to 33% reported by Neetu Singh et al.[11] while study conducted in Archibong et all unexplained IUFD was seen in 41% of cases.[12] While another study conducted by Sheth VS showed unexplained IUFD in 38.7% of cases which proves that unexplained IUFD remains still the common cause of IUFD even in our present generation.[13] Antepartum hemorrhage leads to maternal blood loss leading to hypovolemia, anemia, hypoxia, hypertonic uterine contraction causing fetal hypoxia and death. In PIH, vasospasm decreases blood flow to all organs particularly uteroplacental perfusion so oxygen supply to fetus decreases and leads to fetal hypoxia and IUFD. In the present study, cord accidents accounted for 3 (1.76%) which were emergency admission presented with prolapsed cord. Anjali C et al, reported 1.9% cord accidents.[14] In present study, 26 (15.9%) cases of congenital defect leading to IUFD. Anjali C et al, and Kumar et al, had reported IUFD due to congenital malformation in 10.5% and 10% respectively.[14,15] In the study by Kumar et al, Patel et al, PIH was the most common cause of IUFD in 19% and accidental haemorrhage in 9.8%.[16,17] In present study, normal vaginal delivery occurred in 145 (85.29%) compared to Korde NV et al and Chitra K et al, who had reported vaginal delivery in 73.1% and 89.4% respectively.[17] Surgical intervention was required in 25 (14.7%). Caesarean section required in 17 (12.4%) and hysterotomy in 8 (3.7%). Indication for caesarean section was previous cesarean section with induction failure in two cases and previous cesarean section with severe abruptio placenta, previous 2 cesarean section. Hysterotomy was done in one case of previous 3 cesarean section and 2 cases were induction failure. Most common complication associated with IUFD was hypovolemic shock i.e. 13 out of 170 (7.6). DIC that occurred in 9 (5.29%) and all of them required transfusion of blood components. In most cases more than one component was given. Thormboplastins released from blood clots, damaged placenta and dead fetus activates coagulation cascade and that leads to DIC.[18] These cases were managed by treatment of underlying condition and by maintaining perfusion to vital organs, transfusion of blood and blood components. Availability of multispecialty and intensive care helps in management of these patients. Acute Renal Failure (ARF) was encountered in 7 (4.1%) presented with abruptio placenta which were managed by hemodialysis. Septicemia was present in 8 (10%) and managed by intravenous fluid and higher antibiotics. During this study period maternal mortality occurred in 3 (1.76%) due to multiple organ dysfunction. The causes of maternal mortality were abruptio placenta leading to DIC, another patient had DKA and last one had eclampsia with cerebral injury. Similar study was conducted by Swapnil et al in which most common complication encountered was DIC (22.5%), ARF in 3.7% while maternal moratlity was seen in 1.3% of case.[19]

## CONCLUSION

Different etiological factors responsible for IUFD are poor health seeking behaviour, poverty, illiteracy, poor

nutrition etc. Despite availability of modern intervention like non stress test, ultrasonography majority of causes of IUFD remains unknown. PIH, DM, PROM remains the major maternal cause of IUFD while most common fetal cause are preterm babies and anomalous baby. Early diagnosis and termination of pregnancy remains keystone for prevention of complications of IUFD like Acute Renal Failure, DIC. Hypovolemic shock etc. IUFD can be prevented by early registration of pregnancy, good nutrition, regular ANC visits and early referral to tertiary centre.

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## REFERENCES

1. Kowaleski J. state definition and reporting requirements for fetal death. Hyattsville, Maryland. NCHS-1997.
2. American College of Obstetricians and Gynecologists. Diagnosis and management of fetal death. ACOG Technical Bulletin no 176. Int J Gynecol Obstet. 1993;42:291-9.
3. Richardus, Jan H, Graafmans, Wilco C. The perinatal mortality rate as an indicator of quantity of care in international comparison. Med Care. 1998;36(1):54-66.
4. Al Kadari, Hanan T, Hani. Factors contributing to intra uterine fetal death. Arch Obstet Gynaecol. 2012;286(5):1109.
5. Showghy S, Milaat W. Early teenage marriage and subsequent pregnancy outcome. East Mediterr Health J. 2000;6(1):46-53.
6. Fretts RC, Usher RH. Causes of fetal death in women of advanced maternal age. Obstet Gynaecol. 1997;89:40.
7. Korde NV, Gaikwad P. Causes of stillbirth. J Obstet Gynaecol India. 2008;58
8. Rai R, Regan L. Antiphospholipid in pregnancy. Curr Obstet Gynaecol. 1998;8:32.
9. Patel S, Thaker R, Shah P, Majumder S. Study of causes and complications of intra uterine fetal death (IUFD). Int J Reprod Contracept Obstet Gynecol 2014;3:931-5.
10. Chitra K, Nitin N, Anuradha K, Anil S. Intrauterine fetal death: a prospective study. J Obstet Gynaecol India. 2001;51(5):94-7.
11. Silver RM. Fetal death. Obstet Gynaecol. 2007;109:153.
12. Neetu S, Kiran P, Neena G, Arya AK. A retrospective study of 296 cases of intrauterine fetal death at a tertiary care center. Int J Reprod Contracept Obstet Gynaecol. 2013;2(2):1416.
13. Archibong EI. King Khalid university of medicine Saudi Arabia Pg 80-110, citation-west. Afr J Med. 2005;24(1):13-7
14. Kumar AK, Kanakeri R, Anjanappa B. Clinical study of various risk factors associated with intrauterine fetal death. Int J Reprod Contracept Obstet Gynecol 2017;6:5293-8.
15. Anjali C, Vineeta G. Epidemiology of Intrauterine fetal deaths: a study in tertiary referral center in Uttarakhand. IOSR J Dent Med Sci. 2014;13(3):03-6.
16. Kumar RM, Devi A, Bhat V, Oumachigui A. Analysis of stillbirths in referral hospital. J Obstet Gynaecol India. 1996;46:791.
17. Patel S, Thaker R, Shah P, Majumdar S. Study of causes and complication of iufd. Int J Reprod Contracept Obstet Gynecol. 2014;3(4):931-5.
18. WHO. Stillbirths, 2014. Available at: www.who.int/maternal_child_adolescent/epidemiology/stillbirth/en/. Accessed on 16 August 2014.
19. Cousens S, Stanton C, Blencowe H, Chou D, Ahmed S, Steinhardt L, et al. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. Lancet. 2011;377(9774):1319-30.
20. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No 86. ACOG Obstet Gynaecol. 2007;110(4):941-56.

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