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Second Trimester Intrauterine Death: Still an Enigma

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Abstract: ***Introduction: Intrauterine Fetal Demise (IUFD) is a major obstetrical catastrophe at any gestational age which causes emotional pain, distress to patient and her family. IUFD indicates no fetal heartbeat detected after 20 weeks gestation. Incidence of IUFD in India reported between 24.4-41. 9%. Causes of stillbirth fall into following 3 broad categories; Maternal, Fetal & Placenta or Umbilical cord related. The importance of determining the cause of fetal death is that only when the cause is known, the patient can be counselled about the chance of recurrence and attempts at prevention or treatment can be initiated. In case of III trimester IUFD, the obstetrician and mother may remain doubtful whether the fetus could be saved if delivered earlier but in case of II trimester IUFD, cause of death is more important as the fetus is not salvageable. Material and Methods: This study was conducted under Department of Obstetrics and Gynaecology, Dr. S. N. Medical College, Jodhpur which is hospital-based Case Control Observational study. 50 patients were included in both study and control groups and desired data collected. Results: The major causes of II trimester IUD were hypertensive disease of pregnancy and abruptio placenta with maximum incidence seen in multipara and age group 21-30 yrs. 10% cases had congenital abnormalities in fetus. Conclusion: 2nd trimester IUFD is disappointing both for obstetrician as well as mother, prevention is therefore the hallmark. The antenatal fetal deaths can be minimized with regular ANCs, early detection of antepartum complications and treatment. Improving education status, emergency transportation facilities, socio-economic status and facilities available at the peripheral centres can help in reducing the mid trimester IUFD rate.***

Keywords: Second trimester, IUD, intrauterine death, Maternal, fetal, umbilical, observational, case control, hypertensive, abruptio placenta, multipara, congenital, ANC, Antenatal care

1. Introduction

Intrauterine Fetal Demise (IUFD) is a major obstetrical catastrophe at any gestational age which causes emotional pain, distress to both parents and their families. Most of the time it occurs in seemingly normal pregnancy without warning. The emotional, psychological and social effects increase with duration of gestation. Intrauterine fetal demise indicates no fetal heartbeat detected after 20 weeks gestation[1]. It is also called stillbirth which means that at birth a fetus was born without spontaneous breath, heartbeat, or movement[2]. World Health Organization defines that stillbirth is a baby born with absolutely no signs of life at or after 28 weeks gestation, weight > 1000 g, crown-heel length (CHL) > 35 cm• Fresh stillbirth or Intra partum stillbirths are defined as stillbirths occurring after the onset of labour in less than 12 hours before delivery with no skin changes weighing more than 1,000 grams and more than 28 weeks of gestation, but excludes severe lethal congenital abnormalities. The total estimated number of global stillbirths is 3.2 million annually[3,4]. The prevalence of intrauterine fetal demise varies from 5–32/1000 between nations, with a higher rate in developing countries than developed countries[4]. Incidence of intrauterine fetal death in India reported from various centres ranges between 24.4-41.9%. These results may represent different levels of healthcare among distinct geographically-defined communities, socioeconomic status, literacy level, customs, taboos of countries. By contrast, stillbirth rates may be one of the quality indicators of a country's medical system. IUFD has multifactorial etiologies, little research has been conducted on other aspects of specific trimester of pregnancy and stillbirth causes[5]. Second trimester pregnancy loss is uncommon, but it should be regarded as an important event in a woman's obstetric history. However, a cause and-effect relationship may be difficult to establish. A study was conducted at Sher-i-Kashmir College of Medical Sciences[6], Srinagar in the year 2017, according to this study, incidence of IUFD was 28 per 1000 live births, out of which 25.71% were 2nd trimester IUFD. Another study conducted in tertiary care hospital in Bengaluru in 2015, according to this study, as the gestational age reduced, the incidence of IUFD raised[7], it was higher in 2nd trimester IUFD (52.8/1000 live births) than 3rd trimester IUFD (14.6/1000 live births). Fetal loss is a sensitive indicator of quality of maternal care during antenatal period and childbirth. Illiteracy, poor socioeconomic condition and social taboos are important contributory factors responsible for higher fetal mortality rate, as all these prevent women to go to the hospital for health check-up. Causes of IUFD like eclampsia, pre-eclampsia diabetes are preventable to some extent, by good antenatal care. Intrauterine fetal demise has multifactorial etiologies. A thorough history and physical examination should include inquiries about previous pregnancy loss. Known causes of stillbirth fall into following three broad categories[8]; 1. Maternal causes (uncontrolled diabetes, high blood pressure, obesity, syphilis etc.) 2. Fetal and neonatal causes (birth defects or genetic problems, Small for gestational age) 3. Placenta or umbilical cord related issues. The causes of 2nd trimester IUFD are categorized under the following 6-1. Diseases of pregnancy:-Preeclampsia-Antepartum haemorrhage-Gestational DM-Rh

incompatibility 2. Maternal diseases in pregnancy:-Diabetes Mellitus-Chronic hypertension-Chronic renal failure-Severe anaemia-Maternal infection e.g. malaria, jaundice, typhoid, syphilis, viral infection-Hyperpyrexia due to any cause-Autosomal diseases-Thrombophilias-Drug abuse 3.Placental/ umbilical cord abnormalities:-Chorioamnionitis-Umbilical cord knots-Cord haemangiomas-Twin to twin transfusion syndrome 4.Fetal causes:-IUGR-Congenital malformation-Fetal to maternal haemorrhage 5.Idiopathic. Once the diagnosis of intrauterine fetal death is established, the complications occur as the length of time a dead fetus is retained in the uterus increases[9]. The intrauterine death of the fetus causes psychological and physical reactions in family. It is characterized by emptiness, restlessness, numbness, sadness, fatigue, self-blame, and questioning others doubt. The dead tissue favour bacterial growth and with disastrous consequences. Bacterial toxins may get absorbed into the mother if amniotic sac gets infected from vagina due to rupture of membranes and septicemia may develop, this risk is more in diabetic women. • Blood Coagulation Disorders also have disastrous implications. Three Possible mechanisms were thought of by Weiner[49] which are: 1. The products of pregnancy contained in the uterus, possibly some toxic placental or fetal substance depress the production of fibrinogen by liver. 2. Fibrinolytic digestion of plasma fibrinogen causing secondary afibrinogenemia. 3. Some thromboplastic material from the uterine content gains entrance into the maternal circulation and causes intra-vascular coagulation with consumption of fibrinogen. Illiteracy, poor socioeconomic condition and social status of women and misbeliefs are important contributory factors responsible for higher fetal mortality rate, as all these prevent women to go to the hospital for health check-up. Since many attempts have been made to lower the death of new born 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 fetal mortality. So, attention is now drawn towards the unborn babies in utero in order to get a live baby and so that perinatal mortality can be further reduced. Newer techniques of diagnosis and a better understanding of pathophysiology have led to the determination of cause of death in a greater proportion of fetal deaths than in the past. The importance of determining the cause of fetal death is that only when the cause is known, the patient can be counselled about the chance of recurrence and attempts at prevention or treatment can be initiated. In case of third trimester IUFD, the obstetrician and mother may remain doubtful that had the patient delivered earlier, she might have given live birth. But in case of second trimester IUFD, cause of death is more important as thefetus is not salvageable.

Aims and Objectives

- To assess and compare the risk factors associated with second trimester intrauterine death.
- To study maternal outcome of 2nd trimester intrauterine death.

2. Material and Methods

This is a case control observational study May 2021 to October 2021.

50 cases of second trimester intrauterine fetal deaths and 50 controls were studied in Umaid Hospital, Jodhpur, Rajasthan.

Below particulars were enquired from patients whose data has been taken for research.

Basic information regarding education, occupation was collected. Maternal history regarding previous stillbirth, substance abuse, any medical illness in patients and family were observed. History of antepartum complications, hemorrhage, details of labor were collected and finally placental examination was done.

Inclusion Criteria:

- Women admitted in Umaid hospital with second trimester intrauterine death (21-28 weeks).
- Women who give written informed consent for this study.
- Control Group- Women with gestational age >28 weeks.

Exclusion Criteria

Those patients in which labour was induced with a live fetus that died during labour or immediately after birth.

3. Results

Table 1: Incidence of second trimester intrauterine death

Total no of deliveries	22780
No. of IUFD deliveries	753
No. of 2nd trimester IUFD	106
Incidence of IUFD	33/1000 Births
Incidence of second trimester IUFD	4.65/1000 Births

The above table shows that in year duration total deliveries were 22780, total IUFD were 753 and 2nd trimester IUFD were 106 hence, incidence of IUFD deliveries in the present study was33/1000 births and incidence of 2nd trimester IUFD was 4.65/1000 births.

Table 2: Maternal age and second trimester IUFD

Age (yrs)	Case		Control		Total	
	N	%	N	%	N	%
≤20	9	18	8	16	17	17
21-30	30	60	33	66	63	63
≥31	11	22	9	18	20	20
Total	50	100	50	100	100	100

Chi square 32.01 P value 0.037 (S).

In our study maximum patients i.e. 60% were of age group 21-30 years, followed by 22% of age group ≥31 years and 18% were ≤20 years of age.

Table 3: Area wise distribution of second trimester IUFD

Locality	Case		Control		Total	
	N	%	N	%	N	%
Rural	30	60	26	52	56	56
Urban	20	40	24	48	44	44
Total	50	100	50	100	100	100

Chi square 0.649, P value 0.420.

60% cases were from rural areas while 40% cases were from urban areas. Among control group 52% were from rural area and 48% were from urban areas.

Table 4: Educational status and second trimester IUFD

Education	Case		Control		Total	
	N	%	N	%	N	%
Post Grad.	1	2	2	4	3	3
Graduation	3	6	5	10	8	8
Secondary	10	20	18	36	28	28
Primary	9	18	7	14	16	16
Literate	10	20	10	20	20	20
Illiterate	17	24	8	16	25	25
Total	50	100	50	100	100	100

Among 50 cases in this study 34% were illiterate, 20% were literate and 18% were in primary education group.

Table 5: Antenatal checkups and second trimester IUFD

ANC Visit	Case		Control		Total	
	N	A	N	A	N	A
Unbooked	28	56	9	18	37	22
1-2	18	36	36	72	54	66
≥3	4	8	5	10	9	5
Total	50	100	50	100	100	100

Chi square 15.86 P value 0.007 (S)

Out of 50 cases 56% were unbooked, 44% were booked; 56% had no antenatal checkup, 36% had 1-2 checkups while 8% cases had ≥ 3 checkups.

Table 6: Obstetric history

GRAVIDA	Case		Control		Total	
	N	%	N	%	N	%
G1	12	24	10	20	22	22
G2	14	28	19	38	33	33
G3	12	24	15	30	27	27
G4	4	8	3	6	7	7
≥G5	8	16	3	6	11	11
Total	50	100	50	100	100	100

Chi square 3.688, P value 0.449.

Among 50 cases, 12 cases were G1, 14 were G2, 12 were G3, 4 were G4 and 5 were G5≤, while in 50 controls, 10 cases were G1, 19 were G2, 15 were G3, 3 were G4 and 3 were G5≤.

Table 7: Obstetric history and age group comparison

Age	Primigravida				Multigravida			
(YRS.)	Case	%	Control	%	Case	%	Control	%
≤20	7	58.33	4	40	2	526	4	10
21-30	5	41.66	5	50	25	6579	28	70
≥31	0	0	1	10	11	2895	8	20
Total	12	100	10	100	38	100	40	100

This table shows among 50 cases 12 cases were primigravida while 38 were of G2 or more, out of these 38 cases, 25 cases were of 21-30 years of age group. Out of these 38 multigravida cases, 8 (21.05%) had history of IUFD in previous pregnancy. Various risk factors need careful evaluation with appropriate investigations to prevent recurrent IUFD. These are APH, HDOP, genetic and cardiac disease.

Table 8: Substance abuse and second trimester IUFD

Substance Abuse	Case		Control		Total	
	N	%	N	%	N	%
Exposed	6	12	4	8	10	10
Non Eposed	44	88	46	92	90	90
Total	50	100	50	100	100	100

Out of 50 cases 12% cases are exposed to substance while 88% cases are non-exposed. Among 50 controls 8% are exposed to substance and 92% are non-exposed.

Table 9: Antenatal status in second trimester IUFD

Antenatal Complication	Case	Control
Anemia(Moderate To Severe)	25	11
Hypertension	15	7
APH	8	4
IUGR	2	1
Diabetes	2	1
Heart Disease	0	1

Among 50 cases, 25 cases were earlier present with moderate to severe anemia, 15 cases were hypertensive, 8 cases with APH, 2 case with IUGR and 2 case with DM.

Table 10: Clinical presentation at the time of admission

Presenting Signs and Symptoms	Cases	Percentage
Pain Abdomen	5	10
Decreased/Loss of Fetal Move.	6	12
Documented IUD by USG	18	36
Bleeding PV	10	20
S.PIH	3	6
S. Anemia	4	8
Other	4	8
Total	50	100

Among 50 cases, 36% cases presented with documented IUD by USG on admission, 20% cases present with bleeding per vaginum, 12% cases present with loss of fetal of movement, 10% cases present with pain abdomen. There were 18 patients already documented as IUD, rest 32 patients were diagnosed IUD after admission to other clinical presentation.

Table 11: Mode of delivery and second trimester IUFD

Mode of Delivery	Case		Control		Total	
	N	%	N	%	N	%
LSCS	4	8	6	35.29	10	14.93
Vaginal	46	92	11	64.71	57	85.07
Total	50	100	17	100	67	100

Odd ratio, 0.159, P value 0.013 (S)

Among 50 cases, 46 cases were delivered vaginally while 4 delivered abdominally, while in 17 delivered controls, 11 delivered vaginally and 6 delivered abdominally. Out of 4 cases who delivered abdominally, 2 were case of eclampsia, 1 case of placenta previa and 1 case of abruptio placenta.

Table 12: Type of labour and second trimester IUFD

Type of Labour	Case		Control		Total	
	N	%	N	%	N	%
Induced	39	78	8	17.39	47	77.04
Spontaneous	11	22	3	6.52	14	22.95
Total	50	100	11	23.91	61	100

Among 50 cases, 39 cases induced while 7 case goes spontaneously in labour, while in controls, 8 were induced and 3 were goes spontaneously in labour.

Table 13: Method of induction and second trimester IUFD

Method of Induction	Case		Control		Total	
	N	A	N	A	N	A
Arm	2	5.13	0	0	2	4.26
Oxytocin	1	2.56	1	12.5	2	4.26
Prostaglandin	36	92.31	7	87.5	43	91.5
Total	39	100	8	100	47	100

Chi square 1.967, P value 0.374 Among 50 cases, 36 cases were induced with prostaglandins, 2 induced with oxytocin, 1 induced with ARM, while in controls 7 were induced with prostaglandins and 1 with oxytocin. Out of 36 inductions byprostaglandins, 25 were induced by cervix priming gel, 8 induced by mifepristone and misoprostol combination and 3 were induced by onlymisoprostol tablet.

Table 14: Antepartum haemorrhage and second trimester IUFD

APH	Case		Control		Total	
	N	%	N	%	N	%
Abruption	9	18	3	6	12	12
Pl. Previa	2	4	1	2	3	3
Absent	39	78	46	92	85	85
Total	50	100	50	100	100	100

Chi square 3.843, P value 0.049 (S)

This table shows Antepartum haemorrhage was present in 11 cases out of 50. Abruption was present in 18% cases and placenta previa was present in 4% cases, while in controls 6% have abruption and 2% have placenta previa.

Table 15: Hypertensive disease of pregnancy and second trimester IUFD

Hypertensive Diseases	Case		Control		Total	
	N	%	N	%	N	%
Mild Preeclampsia	5	10	2	4	7	7
Severe Preeclampsia	4	8	1	2	5	5
Iminent Eclampsia	3	6	1	2	4	4
Eclampsia	3	6	2	4	5	5
Absent	35	70	44	88	79	79
Total	50	100	50	100	100	100

Chi square 5.314, P value 0.021 (S).

This table shows hypertensive diseases of pregnancy was present in 15 cases out of 50. Eclampsia was present in 6% cases, imminent preeclampsia was present in 6% cases, severe preeclampsia was present in 8% cases, mild preeclampsia was present in 10% cases. While in 6 controls, eclampsia was present in 4% cases, imminent preeclampsia was present in 2% cases, severe preeclampsia was present in 2% cases, mild preeclampsia was present in 4% cases.

Table 16: Gender of fetus and second trimester IUFD

Fetus Gender	Case		Control		Total	
	N	A	N	A	N	A
Male	22	42.31	8	47.06	30	43.48
Female	30	57.69	9	52.94	39	56.52
Total	52	100	17	100	69	100

Chi square 0.117, P value 0.731.

This table shows out of 50 cases and 52 fetal outcome (2 twin), gender of fetus was male in 22(42.31%) and female in 30(57.69%) cases and out of 17 controls, gender of fetus was male in 8(43.48%) and female in 9(56.52%).

Table 17: Distribution of fetal weight in case group

Weight (in grams)	No. of Patients	Percentage
500-700	18	36.62
701-900	30	57.69
901-1200	4	7.69
TOTAL	52	100

Among 50 cases, 52 fetus delivered, out of this,18 fetus were 500-700 gm, 30 fetus were 701-900 gm, 4 fetus were with 901-1200 gm weight.

Table 18: Distribution of fetal weight in control group

Weight(in gms)	Patients No.	Percentage
1250-1800	4	23.53
1801-2400	10	58.82
≥2401	3	17.65
Total	17	100

Among 17 delivered controls, 4 fetus were 1250-1800gm, 10 fetus were 1801- 2400gm and 3 fetus were more than 2401gm.

Table 19: IUD corresponding with period of gestation

Period of Gestation	No. of Cases	Percentage
20-22 wks	7	14
23-25 wks	14	28
26-28 wks	29	58
Total	50	100

According to this table, 14% case were seen of 20-22week period of duration ,28% cases were 23-25week duration and 58% case were seen with 26-28week duration.

Table 20: Maternal outcome in second trimester IUFD

Maternal Outcome	Cases No.	Percentage
Uneventful	44	88
Eventful	6	12
Death	0	00
Total	50	100

P value 0.325

Out of 50 cases, in 88% maternal outcome was uneventful, in 12% case were eventful. In controls 100% were in uneventful group. Out of this cases, 4 cases were in near miss maternal criteria according to WHO criteria, 2 cases with >5 units of blood and 2 cases with intubation >60 mins.

Table 21: Placental abnormalities and second trimester IUFD

Placenta and Cord Abnormalities	Case		Control		Total	
	N	A	N	A	N	A
Abnormal Cord Insertion	4	57.2	1	50	5	42.8
True Knot	1	14.3	0	0	1	14.3
Cord Hemangioma	1	14.3	0	0	1	14.3
Ttts	1	14.3	1	50	2	28.6
Total	7	100	2	100	9	100

Among 50 cases, 4 cases presented with abnormal cord insertion, 1 case presented with true knot, 1 case with cord haemangioma, 1 case with TTTS, out of 50 controls, 1 case with abnormal cord insertion and 1 case with TTTS.

Table 22: Congenital abnormalities and second trimester IUFD

Congenital Fetal Abnormalities	Case		Control		Total	
	N	A	N	A	N	A
Hydrcephalus	2	4	1	2	3	3
Anencephaly	2	4	1	2	3	3
Hydrops Fetalis	1	2	0	0	1	1
Absent	45	90	48	96	93	93
Total	50	100	50	100	100	100

Odds ratio 2.67

Among 50 cases, 2 cases presented with hydrocephalus, 2 cases presented with anencephaly and 1 case with hydrops fetalis, while in controls 1 case presented with hydrocephalus and 1 case presented with anencephaly.

Table 23: Placental examination and second trimester IUFD

Placenta	Case		Control		Total	
	N	A	N	A	N	A
Abnormal Morphology	44	6	15	2	59	8
Infarct	39	11	13	4	52	15
Abnormal Histopathology	11	13	5	2	16	15

N-Normal, A-Abnormal

Out of 50 cases, gross examination of placenta done and found abnormal morphology in 12% case and infarct was present in 22% cases, while in controls 4% had abnormal morphology and 6% had infarcts. Histopathology was abnormal in 13 cases, while in controls 2 had abnormal histopathology.

Table 24

Apparent Cause of IUD	No. of Patients	Percentage
Hypertensive Disease of Pregnancy	15	30.00
Abruptio Placenta	9	18.00
Congenital Anomaly	5	10.00
Placental Ab	5	10.00
Unexplained	3	06.00
Sev.Anemia	3	06.00
GDM	2	04.00
Infection	2	04.00
Placenta Previa	2	04.00
APLA	2	04.00
Severe IUGR	2	04.00
Total	50	100.00

This table depicts cause of death for second trimester IUFD. It clearly shows major cause of death is hypertensive disease of pregnancy (30.00%) followed by abruption (18.00%) followed by congenital anomaly (10.00%), placental abnormalities (10.00%), severe anaemia (6%) and unexplained (6%) cases.

4. Conclusion

In conclusion, second trimester IUFD is a bitter calamity, prevention is therefore the hallmark. The antenatal fetal deaths can be minimized with regular ANCs and timely admission. Early detection of pre- eclampsia by regular ANCs and its treatment can reduce its complications including IUFD and abruptio placenta in few cases thereby further reducing the fetal death rate. Death of the fetus due to congenital anomalies and deaths due to cord abnormalities cannot be prevented totally. All other factors can be prevented from causing second trimester IUFD by proper care during pregnancy and undertaking timely interventions. The factors which prevent timely admission to a centre where facilities are available include unavailability of proper transportation facilities and also in many of the patients, the financial constraint. Education of the patient to avail obstetric care, proper planning of mid wives visits to pregnant women, more frequent visits for high-risk pregnancies, timely reference to specialist will minimize fetal wastage. Hence improving the general condition of the people including their education, availability of emergency transportation facilities round the clock made free of cost, improvement of socio-economic status and lastly improving the facilities available at the peripheral centres can go a long way in reducing the intrauterine fetal death rate.

References

[1] American Academy of Pediatrics and the American College of Obstetricians and Gynaecologists; Guidelines of Perinatal care, 5 th edition. Washington DC, AAP an ACOG 2002.
[2] Ian Donald, Practical Obstetric Problems. Sixth Edition.
[3] Clin Obstet and Gynecol Vol 30, No 2 June 1987.
[4] Dippel AL, Death of a fetus in utero. Johns Hopkins Medical Journal 1934; 54:
[5] Berkowitz, G.S. and Papiernik, E. (1993) Epidemiology of preterm birth. Epidemiol. Rev., 15, 414–443.
[6] Kumari R, Mengi V, Kumar D. Maternal Risk Factors and pregnancy wastage in a rural population of Jammu District. JK science 2013:15(2):82.
[7] Malati AJ, Lalana GC. Perinatal mortality in vellore, A study of 21585 infants. Indian j paediatrics 1986;53(3):347-52
[8] Crenn Hebert, C., Bouyer, J., Collin, D. et al. (1986) Spontaneous abortion and interpregnancy interval. Eur. J. Obstet. Gynecol. Reprod. Biol., 22, 125–132.
[9] Hay, P.E., Lamont, R.F. and Taylor-Robinson, D. (1994) preterm delivery and late miscarriage. Br. Med. J., 308, 295–298.
[10] Weiner AE, Reid DE, Roby CC, Diamond LK. Coagulation defects with IUD from Rh sensitization. Am J ObstetGynaecol1950;60:1015.