

## A Prospective Observational Study to Evaluate the Maternal and Fetal Factors Associated with Intrauterine Fetal Death

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### Abstract

**Aim:** To Study the maternal and fetal factors associated with intrauterine fetal death.

**Methods:** A prospective observational study was conducted in the Department of Obstetrics and Gynecology, Patna Medical College and Hospital, Patna, Bihar, India, from July 2020 to June 2021. The cases of intra-uterine fetal death either with ultrasound reports proving IUFD or diagnosed on clinical examination by absence of fetal heart rate and fetal movements were studied. All 100 cases of IUFD with gestational age >20 weeks and <42 weeks period of gestation. Detailed obstetric history, details about present complaints and duration of present pregnancy, past obstetric performances and outcomes (including previous abortions, previous IUFD, associated toxemias, etc.,) were studied

**Result:** In the present study mean maternal age was 26.03 years (Mean±SD: 27.03±4.62). Out of 100 women, 2% were <20 years, 80% were 20-30 years, 16% were 30-40 years and 2% were >40 years of age. In present study, out of 100 fetuses, 53% were female and 47% were male foetuses. Weight of the foetuses were as follows: 48(48%) weighed <1000 grams, 20 (20%) weighed 1001-1500 grams, 10 (10%) weighed 1501-2000 grams, 10(10%) foetuses weighed 2001-2500 grams, 10(10%) were 2501-3000 grams and 2 (2%) weighed > 3000 grams. Mean weight of the fetus in present study was 1334 gms (Mean±SD: 1334.59±814.36). In present study, 20 (20%) IUFD were unexplained, 10 (10%) IUFD were due to abruption placentae, 5 (5%) were due to cord accidents, 16 (16%) were due to Hypertension related complications, 5 (5%) were due to diabetes, 8 (8%) were due to severe oligohydramnios, 3 (3%) were due to premature rupture of the membranes, 5 (5%) were due to Rh isoimmunisation, 22 (22%) were having major congenital anomalies, 3 (3%) were having nonimmune hydrops and 2 (2%) was due to polyhydramnios. In present study, 16(57.14%) of women had hypertension related complications. 5 (17.86%) were diabetics. 5(17.86%) had Rh isoimmunisation, 1 (3.57%) had bicornuate uterus and 1 (3.57%) had septate uterus.

**Conclusion:** PIH (hypertensive disorders of pregnancy) abruption placenta and congenital anomalies were the leading causes of the IUFD. Significant proportion of IUFD due to PIH and

abruption placenta is preventable by regular ante natal care and timely intervention and treatment for PIH.

**Keywords:** PIH, IUFD, IUD.

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## Introduction:

Stillbirth is a fetal death after a defined gestational age and/or fetal weight, both of which have historically lacked uniformity. Currently, the most recognized definition of stillbirth is a fetal death that occurs at or greater than 20 weeks gestation or at a birth weight greater than or equal to 350 grams. Standardization of the definition of stillbirth is a current priority. Stillbirth" has replaced "intrauterine fetal demise" as the terminology of choice [1].

Worldwide 3.3 million stillbirths are reported annually, 97% occurring in developing countries. Only 4% of cases are registered in developing countries where under reporting is common. It is believed that an additional 1-2 million of unrecorded stillbirths occur in these developing countries [2].

Several risk factors related to IUFD have been highlighted regarding its etiopathogenesis in various studies. The most frequently identified risk factors are a high body mass index, maternal age above 35, smoking, high blood pressure in pregnancy [3]. Placental involvement is most common in the etiopathogenesis of the occurrence of IUFD [4] [5]. Other causes are funicular abnormalities, maternal fetal hemorrhages, chromosomal, malformative and infectious abnormalities [3].

The diagnosis of certainty is made on fetal ultrasound. In addition, the etiological diagnosis may require specific examinations such as fetal autopsy, pathological and infectious placental analysis, fetal karyotype

analysis, or fetal MRI [3]. Hence the present study was conducted with aim to identify risk factors associated with IUFD.

## Material and methods

A prospective observational was conducted in the Department of Obstetrics and Gynecology, Patna Medical College and Hospital, Patna, Bihar, India, from July 2020 to June 2021, after taking the approval of the protocol review committee and institutional ethics committee.

The cases of intra-uterine fetal death either with ultrasound reports proving IUFD or diagnosed on clinical examination by absence of fetal heart rate and fetal movements were studied.

## Inclusion criteria

- All cases of IUFD with gestational age >20 weeks and <42 weeks period of gestation.

## Exclusion criteria

- All cases of IUD with gestational age <20 weeks and >42 weeks
- Molar pregnancy

When a patient comes with complaints of absent fetal movements or comes with an ultrasound report showing intra- uterine fetal death; the age, parity, literacy, socio-economic status were recorded.

Detailed obstetric history, details about present complaints and duration of present pregnancy, past obstetric performances and outcomes (including previous abortions,

previous IUFD, associated toxemias, etc.,) were studied

In the present pregnancy, details of ante-natal check-ups, medical illness, presence of antepatum hemorrhage, pregnancy induced hypertension, eclampsia, severe anemia and other significant illness were also noted. Those patients who had attended antenatal clinic at least thrice before delivery were considered booked cases.

Clinical examination is done. General condition of the patient is noted. On per abdomen examination height of uterus, tone of uterus, feeling of "eggshell crackling sign", presentation and position of fetus, liquor and its quantity noted. Absent FHS is noted.

In per speculum examination any bleeding from os or prolapse of cord noted, liquor-colour and smell were noted. If the patient

has come with history of absent fetal movements and on examination FHS is not localized USG examination is done to confirm the diagnosis of intrauterine fetal death.

Mode of delivery and birth weights of fetuses were noted. All the fetuses were examined for any malformations and each placenta checked for its appearance, weight, retro-placental clot/infarcts and calcification. All patients were followed for 3 days for post-delivery complications.

### Results

Table 1 describes demographic details of the study. In the present study mean maternal age was 26.03 years (Mean±SD: 27.03±4.62). Out of 100 women, 2% were <20 years, 80% were 20 -30 years, 16% were 30-40 years and 2% were >40 years of age (Table 1).

**Table 1: Demographic details**

Parameters	No of patients (N=61)	Percentage
<b>Age (yrs)</b>		
<20	2	2
20-30	80	80
30-40	16	16
>40	2	2
<b>Socio-economic status</b>		
Lower Middle	84	84
Upper Middle	16	16
<b>Registration of antenatal visits</b>		
Booked cases	99	99
Unbooked cases	1	1
<b>Parity</b>		
Primi	49	49
Multi	51	51

Out of 100 women 84 (84%) women belong to lower middle class and 16 (16%) belongs to upper middle class. 99 (99%) women were booked and 1 (1%) was unbooked. 49 (49%) women were primi and 51 (51%) women were multigravidas.

Table 2 describes different characters of IUFD like gender, weight and gestational age of foetuses and mode of delivery. In present study, out of 100 fetuses 53% were female and 47% were male foetuses. Weight of the foetuses were as follows: 48(48%) weighed <1000 grams, 20 (20%) weighed 1001 – 1500

grams, 10 (10%) weighed 1501-2000 grams, 10(10%) foetuses weighed 2001-2500 grams, 10(10%) were 2501-3000 grams and 2 (2%)

weighed > 3000 grams. Mean weight of the fetus in present study was 1334 gms (Mean±SD: 1334.59±814.36).

**Table 2: Details of IUDS.**

Parameters	No of fetuses	Percentage
<b>Gender of fetuses</b>		
Female	53	53
Male	47	47
<b>Fetal weight (Gms)</b>		
<1000	48	48
1000-1500	20	20
1500-2000	10	10
2000-2500	10	10
2500-3000	10	10
>3000	2	2
<b>Gestational age (weeks)</b>		
21-28	33	33
28-32	26	26
32-37	22	22
37-40	19	19
40-42	0.0	0.0
<b>Mode of delivery</b>		
PTVD	76	76
FTVD	19	19
LSCS	3	3
Assisted breech	2	2

Gestational age of the foetuses were-33 (33%) belongs to 21-28 weeks of gestation, 26 (26%) belongs to 29-32 weeks, 22 (22%) belongs to 33 -37 weeks and 19 (19%) belong to 38 to 40 weeks of period of gestation (P=31.79±5.30).

Mode of delivery in present study, out of 100 women-76 (76%) women had preterm

vaginal delivery, 19 (19%) women had full term vaginal delivery, 3 (3%) women had LSCS, and 2 (2%) woman had assisted vaginal breech delivery. Indications for LSCS were previous LSCS with scar tenderness and twin with one fetus was fetal demise.

**Table 3: Clinical risk factors associated with fetal demise**

Factors associated	No. of patients	%
Unexplained	20	20
Abruption placenta	10	10
Cord accidents	5	5
Hypertension related complications	16	16
Diabetes (GDM+Overt)	5	5
Oligohydramnios	8	8
PROM	3	3
Rh iso immunisation	5	5
Congenital anomalies	22	22
Non-immune hydrops	3	3
Polyhydramnios	3	3
Total	100.0	100.0

Table 3 depicts that 20 (20%) IUFD were unexplained, 10 (10%) IUFD were due to abruption placentae, 5 (5%) were due to cord accidents, 16 (16%) were due to Hypertension related complications, 5 (5%) were due to diabetes, 8 (8%) were due to

severe oligohydramnios, 3 (3%) were due to premature rupture of the membranes, 5 (5%) were due to Rh iso immunisation, 22 (22%) were having major congenital anomalies, 3 (3%) were having nonimmune hydrops and 2 (2%) was due to polyhydramnios.

**Table 4: Maternal risk factors associated with IUFD.**

Maternal risk factors	No. of patients	%
Hypertension related complications	16	57.14
Diabetes (GDM+Overt)	5	17.86
Rh iso immunisation	5	17.86
Bicornuate uterus	1	3.57
Septate uterus	1	3.57
Total	28	100

*Maternal risk factors associated with IUD*

Table 4 depicts that 16(57.14%) of women had hypertension related complications. 5 (17.86%) were diabetics.5(17.86%) had Rh

iso immunisation, 1 (3.57%) had bicornuate uterus and 1 (3.57%) had septate uterus.

**Table 5: Placental causes**

Placental causes	No. of women	% of women
Abruption placenta	10	50
Retroplacental clot	3	15
Intraplacental clot	3	15
Unhealthy placenta	4	20
Total	20	100

In present study, out of 100 women 20 had placental causes as the reason for fetal demise. Out of 20, 10 (50%) had abruption placenta. 3 (15%) had retro placental clot 3 (15%) had intra placental clot and 4 (20%) had unhealthy placenta (Table 5).

Table 6 revealed that 22(22%) fetuses had associated congenital anomalies.3 (13.64%)

anencephaly, 2 (9.09%) cystic hygroma, 2 (9.09%) encephalocele, 2 (9.09%) holoprocencephaly, 2 (9.09%) spinabifida, 2 (9.09%) prunbelly syndrome, 5 (22.73%) multiple anomalies, 2 (9.09%) agenesis of corpus collasum, 1(4.55%) extended ascitis, 1 (4.55%) bilateral renal dysplasia.

**Table 6: Fetal congenital anomalies**

<b>Congenital anomalies</b>	<b>No. of women</b>	<b>% of women</b>
Anencephaly	3	13.64
Cystic hygroma	2	9.09
Encephalocele	2	9.09
Holoprocencephaly	2	9.09
Spina bifida+hydrocephalus	2	9.09
Prunbelly syndrome	2	9.09
Multiple anomalies	5	22.73
Agenesis of corpus callosum with dilated ventricles	2	9.09
Extended ascites	1	4.55
Bilateral renal dysplasia	1	4.55
Total	22	100

## Discussion

Maximum number of women in present study group belongs to the age group of 20-30 yrs and lower middle class.

In present study, 20 (20%) IUD were unexplained, 10 (10%) IUFD were due to abruption placentae, 5 (5%) were due to cord accidents, 16 (16%) were due to Hypertension related complications, 5 (5%) were due to diabetes, 8 (8%) were due to severe oligohydramnios, 3 (3%) were due to premature rupture of the membranes, 5 (5%) were due to Rh iso immunisation, 22 (22%) were having major congenital anomalies, 3 (3%) were having nonimmune hydrops and 2 (2%) was due to polyhydramnios.

The hypertensive disorders of pregnancy in IUFD were in Safarzadeha et al 14.1%, Chippa S et al 24.39% and Yogesh et al 17%

and in present study 16.39%, which was comparable to Rathava YR et al [6,8].

The diabetes among IUD's in Safarzadeha et al was 12.76%, in Rathava YR et al. 1% and that of in Nayak SR et al is 10.71% [7,9]. Diabetes in present study was 4.91%.

### *Abruptio placentae and IUD*

The abruption placentae in Rathava YR et al study 12%, and Nayak S R et al is 10.71%. In present study, it was 10%, which is correlating with Nayak SR et al study [7,9].

### *Oligohydramnios and IUD*

The incidence of oligohydromnia in Rathava YR et al study is 3%, and Nayak SR et al is 7.14%. In the present study it was 8%, which is similar to Nayak SR et al [7,9].

### *Polyhydramnios and IUD*

In the present study the incidence of polyhydramnios (3%) was comparable to Nayak et al (3.57%) [9].

### ***Rh iso immunisation and IUD***

The Rh iso immunisation as a cause of fetal demise was found 1% in Anjali et al study and 2.64% in Shaheen S et al and 5% in our study [10,11].

### ***Multiple pregnancy and IUD***

Multiple pregnancy in IUD was 1.9% in Anjali et al, and was 3% in present study [10].

### ***PROM and IUD***

Premature Rupture of membranes was found in Nayak SR et al study in about 3.57% of cases which is similar to our study 3% [9].

### ***Cord accidents and IUDs***

Cord accidents in Anjali et al study is 1.90%, Rathava YR et al is 4% and Swapnil et al study was 2.8%. In the present study it was 5%, which is correlating with Rathava YR et al study [10,9,12].

### ***Congenital anomalies of the fetus and IUD***

Congenital Anomalies in Shaheen S et al study is 19.86%, and Ruth C et al is 14% [11,13]. In the present study it was 22%, which is comparable to Shaheen S et al [11].

### ***Nonimmune hydrops and IUD***

In our study the incidence of non immune Hydrops was 3% which is comparable to Anjali et al study (2.1%) [10].

### ***Unexplained causes for IUD***

Unexplained cause in Shaheen S et al study was 6.2%, 35% in Rathava YR et al and 19.1% Anjali et al [11,9,10]. In our study it was 20%, which is correlating with Anjali et al study [11].

### **Conclusion**

In conclusion PIH (hypertensive disorders of pregnancy) abruptio placenta and congenital anomalies were the leading causes

of the IUFD. Significant proportion of IUFD due to PIH and abruptio placenta is preventable by regular ante natal care and timely intervention and treatment for PIH. Even an attempt to prevent IUFD in PIH, abruptio placenta may cause IUFD because of its unpredictable severity. Congenital anomalies are unavoidable cause of IUD. But treatment for open neural tube defects may be prevented by proper pre-conceptual counselling and folate supplementation throughout pregnancy. Despite advances in diagnostic and therapeutic modalities large number of foetal deaths remains unexplained, even with proper antenatal care. Socio-cultural background, poverty, illiteracy, unawareness and inaccessible health care is some of the reasons that predispose women to IUFD and still birth

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