Original Article

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Prevalence and Clinical Profile of Intrauterine Foetal Death: A Retrospective Observational Study from Odisha, India

Obstetrics and Gynaecology Section

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ABSTRACT

Introduction: Intrauterine Foetal Death (IUFD) remains an important obstetric problem in developing countries. High-risk pregnancies are commonly referred to tertiary care hospitals, where facility-based research is needed to describe the true clinical burden of IUFD.

Aim: To describe the obstetric profile, associated maternal and foetal clinical factors, and outcomes of women managed for IUFD.

Materials and Methods: This was a retrospective observational study of women with a confirmed diagnosis of IUFD managed over a six-month period (July-December 2025) in the Department of Obstetrics and Gynaecology, DH Jharsuguda, Odisha, India. As no comparison group of live births was available, data were summarised descriptively as frequencies, percentages, and mean±standard deviation, no inferential statistical testing was performed.

Results: Fifty-three women with IUFD were identified among 1,822 total deliveries, giving an institutional prevalence of 29.1 per 1,000 deliveries (56 foetuses, including 3 twin pregnancies). Mean maternal age was 25.5±4.3 years; 32 (60.4%) were multigravida and 11 (20.8%) had a previous caesarean section. The most common associated maternal conditions were hypertensive disorders (19, 35.8%), anaemia (12, 22.6%), and placental abruption (11, 20.8%); no maternal cause was documented in 13 (24.5%). Mean hospital stay was 5.8±2.7 days; 47 (88.7%) had a routine discharge and 5 (9.4%) left against medical advice. No maternal deaths were recorded.

Conclusion: IUFD accounted for an institutional prevalence of 29.1 per 1,000 deliveries over the study period. Hypertensive disorders, anaemia, and placental abruption were the most common associated clinical conditions among women with IUFD.

Keywords: Anaemia in pregnancy, Hypertensive disorders of pregnancy, Perinatal mortality, Placental abruption, Stillbirth

INTRODUCTION

In the United States, stillbirth is generally defined as foetal death occurring at a minimum birth weight of 350 grams or a minimum gestational age of 20 weeks, with reporting requirements enforced at these thresholds. The WHO, however, defines stillbirth as foetal death at a minimum of 28 weeks' gestation. This distinction, along with some variation among states, may impact national and international comparisons of stillbirth rates [1].

India contributes a major proportion of the global stillbirth burden, with facility- and population-based estimates ranging from approximately 13 to 23 per 1,000 births depending on setting and data source [2]. The aetiology of IUFD is multifactorial. Recognised causes include maternal hypertensive disorders, diabetes mellitus, severe anaemia, antepartum haemorrhage, infections, umbilical cord accidents, placental dysfunction, and foetal structural or chromosomal anomalies [3,4]. In the Indian context, additional contributory factors include poor socio-economic status, nutritional deficiencies, inadequate antenatal care, and a high prevalence of infections such as malaria and the TORCH (Toxoplasma, Rubella, Cytomegalovirus, Herpes simplex) complex [5]. Beyond perinatal loss, IUFD exposes the mother to significant risks including Disseminated Intravascular Coagulation (DIC), postpartum haemorrhage, puerperal sepsis, and psychological morbidity [6,7].

Tertiary care referral hospitals typically have a higher institutional IUFD rate than population-based estimates, since complicated, high-risk cases are preferentially referred from peripheral facilities; hospital-based retrospective studies of IUFD are therefore useful for describing the clinical spectrum of this condition and the burden faced by referral centres, even though they cannot be generalised to the wider community. The present study was conducted to describe the maternal and obstetric profile, associated aetiological factors, haematological parameters, and hospital course of women managed for IUFD at DH Jharsuguda, Odisha, India.

MATERIALS AND METHODS

This was a retrospective observational study conducted at the Department of Obstetrics and Gynaecology, District Hospital (DH) Jharsuguda, Odisha, India, from July 2025 to December 2025. Institutional Ethics Committee approval (Letter No. 2523/2026) was obtained before data extraction.

The study population comprised all women diagnosed with IUFD and managed at the study centre during the study period (n = 53)

Inclusion criteria: Women with a confirmed diagnosis of IUFD at a gestational age of 20 completed weeks or more, with a complete and retrievable case record available for review were included in the study.

Exclusion criteria: Women with a history of spontaneous abortion below 20 completed weeks of gestation and those with incomplete essential data in the case record were excluded from the study.

Definitions

IUFD was defined as foetal death occurring at or after 20 completed weeks of gestation, confirmed by ultrasonographic demonstration of absent foetal cardiac activity and foetal movements [1].

Hypertensive disorders of pregnancy comprised Pregnancy-Induced Hypertension (PIH), gestational hypertension, preeclampsia, and eclampsia, as documented in the case record.

Anaemia was classified on the basis of admission haemoglobin: no anaemia (Hb ≥11 g/dL), mild-to-moderate anaemia (Hb 7-10.9 g/dL), and severe anaemia (Hb<7 g/dL), in accordance with WHO criteria.

Coagulopathy was defined as a clinically documented clotting abnormality recorded in the case notes, supported by abnormal coagulation parameters where available.

Fresh stillbirth was defined as a stillborn foetus showing no signs of maceration at the time of delivery, indicating foetal death within approximately 6-8 hours before delivery; macerated stillbirth was defined as a stillborn foetus exhibiting signs of intrauterine death including skin discolouration, skin slippage, peeling, or soft tissue breakdown, indicating death occurring more than 6-8 hours prior to delivery, as assessed by the attending clinician [8].

Referral status: Women were classified as referred if they were transferred from a peripheral health facility (primary or secondary care centre) to DH Jharsuguda for further management; women who presented directly from home without prior facility contact were classified as self-presented or unbooked.

Study Procedure

Although the Indian clinical definition of IUFD encompasses all foetal deaths at ≥20 completed weeks, the earliest gestational age documented in the case records of this cohort was 24 weeks. No cases with a documented gestational age between 20 and 23 weeks were identified in the dataset; three records had gestational age marked as unknown. The study therefore included all IUFD cases ≥20 weeks as per the inclusion criterion, with the dataset range reflecting the actual clinical presentations at this referral centre.

Data were extracted using a structured case record form, including maternal age, referring facility, presenting complaint, gravidity, parity, gestational age, previous and current mode of delivery, history of caesarean section and other surgeries, uterine size at admission, associated medical disorders, coagulopathy status, transfusion requirements, haemoglobin levels on admission and discharge, duration of hospital stay, discharge status, birth weight, foetal sex, type of stillbirth (fresh or macerated), and foetal complications. Medical disorders and foetal complications were classified into predefined descriptive categories for analysis.

STATISTICAL ANALYSIS

Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 23.0. Data were summarised using descriptive statistics only: frequencies and percentages for categorical variables and mean±standard deviation for continuous variables. The institutional IUFD prevalence was calculated as the number of IUFD cases divided by the total number of deliveries at the centre over the same period, expressed per 1,000 deliveries.

RESULTS

This study included 1,822 total deliveries at the centre over the same period this gives an institutional IUFD prevalence of 29.1 per 1,000 deliveries. Mean maternal age was 25.5±4.3 years (range 18-35 years); the largest proportion of women (47.2%) was aged 20-25 years [Table/Fig-1].

Variable	n (%)
Age group (years)	
< 20	2 (3.8)
20-25	25 (47.2)
26-30	20 (37.7)
> 30	6 (11.3)
Maternal age, mean±SD	25.5±4.3
Referral status	
Referred from peripheral facility	45 (84.9)
Self-presented/unbooked, from home	8 (15.1)
Obstetric status	
Primigravida	21 (39.6)
Multigravida	32 (60.4)
Twin pregnancy	3 (5.7)
Previous mode of delivery (n = 53)	
No previous delivery (primigravida)	21 (39.6)
Previous vaginal delivery only	21 (39.6)
Previous caesarean section	11 (20.8)

[Table/Fig-1]: Maternal age and obstetric profile (n = 53).

Gestational age at diagnosis was documented for 50 of 53 women (3 records showed gestational age as "unknown"); mean gestational age was 32.5±5.0 weeks (range 24-42 weeks). Mean birth weight was 1.40±0.73 kg with 32.1% weighing under one kg [Table/Fig-2].

Clinical parameter	n (%)
Gestational age at diagnosis (weeks)	
24-27.6	12 (24.0)
28-33.6	15 (30.0)
34-36.6	11 (22.0)
≥37	12 (24.0)
Mean±SD	32.5±5.0
Mode of delivery (n = 53)	
Caesarean section (LSCS)	26 (49.1)
Vaginal delivery (NVD/FTND/PTVD/VBAC)	25 (47.2)
Hysterotomy	2 (3.8)
Foetal sex (n = 56 foetuses)	
Male	34 (60.7)
Female	22 (39.3)
Fresh vs macerated (n = 53 recorded)	
Fresh	42 (79.3)
Macerated	11 (20.7)
Birth weight (n = 56 recorded values) (kg)	
<1	18 (32.1)
1-1.499	11 (19.6)
1.5-2.499	21 (37.5)
≥2.5	6 (10.7)
Mean±SD	1.40±0.73

[Table/Fig-2]: Clinical profile and mode of delivery.
†Fresh vs macerated is recorded per woman; for twin pregnancies a single entry reflects the delivery episode.
NVD:Normal vaginal delivery;FTND: Full-term normal delivery;PTVD:Preterm vaginal delivery;VBAC:Vaginal birth after caesarean

Hypertensive disorders (PIH, preeclampsia, eclampsia, or gestational hypertension) were the most frequently recorded condition (35.8%), followed by anaemia (22.6%) and placental abruption (20.8%). No maternal condition was documented in 24.5% of records [Table/Fig-3].

Condition	n (%)
Hypertensive disorders (PIH/preeclampsia/eclampsia/ gestational hypertension)	19 (35.8)
Anaemia (documented)	12 (22.6)
Placental abruption	11 (20.8)
Rupture uterus	2 (3.8)
Rh alloimmunisation	2 (3.8)
Placenta previa	1 (1.9)
Premature Rupture Of Membranes (PROM)	1 (1.9)
Fever/suspected infection	1 (1.9)
Diabetes/endocrine disorder (type 2 DM, hypothyroidism)	1 (1.9)

No maternal condition documented (No co-morbidities documented)	13 (24.5)

[Table/Fig-3]: Associated maternal clinical conditions (n = 53; not mutually exclusive). Categories are not mutually exclusive as several records documented more than one condition per patient (e.g., "abruption with severe PIH with anaemia"); percentages therefore do not sum to 100%.

Oligohydramnios was noted in three cases (5.7%). Foetal and obstetric complications, where documented, are summarised in [Table/Fig-4].

Complication	n (%)
Oligohydramnios	3 (5.7)
Cord/hand prolapse (obstetric complication)	4 (7.5)
Cord entanglement/nuchal cord	1 (1.9)
Meconium-stained liquor	2 (3.8)
Intrauterine Growth Restriction (IUGR)	1 (1.9)
Malpresentation (transverse lie)	1 (1.9)
Rh/blood group incompatibility noted	1 (1.9)
No foetal/obstetric complication documented	43 (81.1)

[Table/Fig-4]: Foetal and obstetric complications, where documented (n = 53; not mutually exclusive).

Mean haemoglobin on admission was 9.4±1.8 g/dL, other haematological parameters are shown in [Table/Fig-5].

Parameter	n (%)
Haemoglobin on admission, mean±SD (g/dL)	9.4±1.8
Severe anaemia (< 7 g/dL)	2 (3.8)
Mild-moderate anaemia (7-10.9 g/dL)	39 (73.6)
No anaemia (≥ 11 g/dL)	12 (22.6)
Coagulopathy documented	
Yes	3 (5.7)
No	49 (92.5)
Not recorded	1 (1.9)
Whole blood/packed cell transfusion	24 (45.3)
Fresh frozen plasma transfusion	20 (37.7)
Any blood product transfusion	27 (50.9)

[Table/Fig-5]: Haematological parameters and transfusion (n = 53).

Mean duration of hospital stay was 5.8±2.7 days (range 3-22 days) [Table/Fig-6].

Outcome parameter	n (%)
Duration of hospital stay (days)	
1-3	7 (13.2)
4-7	40 (75.5)
> 7	6 (11.3)
Mean±SD	5.8±2.7
Type of discharge	
Routine discharge	47 (88.7)
Absconded/left against medical advice	5 (9.4)
Discharged on request	1 (1.9)
Maternal death	0

[Table/Fig-6]: Hospital course and outcome (n = 53).

DISCUSSION

This study recorded an institutional IUFD prevalence of 29.1 per 1,000 deliveries over a six-month period (July-December 2025) at DH Jharsuguda, Odisha, India. This rate clusters closely with several other Indian hospital-based series with a comparable unbooked/referred-in, high-risk caseload: Karale A et al., reported 27 per 1,000 live births from a Maharashtra tertiary centre [9]; Mittal P et al., reported 29.3 per 1,000 total births in a five-year, seven-hospital sentinel surveillance across Delhi covering 429,246 total births, of which 75.7% were antepartum stillbirths with preterm labour (25.7%) and foetal growth restriction (31.2%) as the leading antepartum maternal and foetal causes respectively; and Changede P et al., reported 30.3 per 1,000 total births from a single Mumbai tertiary centre, where maternal causes accounted for 42%, foetal causes 31%, and placental-cord-liquor causes 20% of all stillbirths by ReCoDe classification [10,11].

The majority of women in this cohort, 45 (84.9%), were referred from a peripheral facility- comparable to the 65% referred-in proportion reported by Changede P et al., consistent with this referral-bias explanation; Mittal P et al., similarly found that of seven major Government hospitals of Delhi, four tertiary-care sites, which handled predominantly referred and high-risk cases, accounted for a disproportionate share of the stillbirths recorded despite covering only about a quarter of area births [10,11].

Mean maternal age was 25.5±4.3 years and 32 (60.4%) were multigravida, broadly consistent with the demographic profile reported in other Indian tertiary-care IUFD case series-Changede P et al., reported a mean maternal age of 26.3 years with 68.7% multigravida, and Mittal P et al., similarly noted a predominance of multigravida women among their stillbirth cohort [10,11].

Caesarean section was performed in 26 (49.1%) of women in this cohort, a proportion that may appear high in the context of foetal demise, where vaginal delivery is generally the preferred mode. However, this figure is explained by the referral profile of the study population: 11 (20.8%) women had a previous caesarean section, making induction of labour relatively contraindicated or requiring careful monitoring; several cases involved obstetric emergencies including placental abruption 11 (20.8%) and ruptured uterus (2, 3.8%), where immediate operative delivery was clinically indicated regardless of foetal outcome; and a proportion of women were referred in active labour with an established indication for caesarean section. These findings are consistent with Changede P et al., who similarly reported a high operative delivery rate at their tertiary referral centre, attributing it to the concentration of complicated obstetric emergencies [10].

Hypertensive disorders were the most frequently documented associated condition in this cohort (19, 35.8%), consistent with the major systematic review by Flenady V et al., which identified hypertensive disorders among the most significant clinical associations with stillbirth in both high- and low-income settings [3]. This was also directly consistent with Changede P et al., tertiary-centre series from Mumbai, in which hypertensive disorders of pregnancy were similarly the single leading identifiable cause of stillbirth, accounting for 66.08% of maternal-cause cases (76 of 115 maternal causes), ahead of foetal growth restriction as the next most common cause [10].

Anaemia was documented as a named clinical condition in 12 (22.6%) of records. This was line with Mittal P et al., much larger multisite surveillance, which similarly found that approximately 50% of women with a stillbirth were diagnosed with anaemia at the facility level [11].

Limitation(s)

The principal limitation of this analysis was that it is based on a retrospective, single-centre case series without a live-birth comparison group, which precludes any inference about risk factors, predictors, or determinant of IUFD. A further limitation was that associated maternal and foetal conditions were coded from free-text entries rather than a standardised proforma with predefined, mutually exclusive categories, and that placental histopathology and foetal autopsy do not appear among the recorded fields.

CONCLUSION(S)

Hypertensive disorders of pregnancy, anaemia, and placental abruption were the most frequently documented conditions, each present in a substantial proportion of affected women, and often co-occurring in the same patient. These findings highlight the need for strengthened antenatal surveillance, early identification and management of hypertensive disorders and anaemia in pregnancy, and improved referral pathways and postdelivery retention strategies at peripheral facilities.

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