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Incidence, etiology, risk factors and maternal outcome for Intrauterine Foetal Death: a prospective study in a tertiary care centre

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ABSTRACT
Aims: Fetal loss is a sensitive indicator of maternal care during antenatal period. The risk of fetal death is known to occur with the extremes of reproductive age, in women with high parity, those with medical problems, smokers, and socially disadvantaged. Complications of intrauterine fetal death include infection, emotional liability, and coagulation defects. With this background, the current study was conducted to know the incidence, aetiology and maternal outcome of IUFD cases.
Materials and methods: A total of 260 cases of IUFD with gestational age >20 weeks irrespective of the gravida were recruited for the study. All cases of intrauterine fetal death with gestational age <20weeks and intrapartum fetal deaths were excluded from the study. Parameters studied were, demographic profile, obstetric details of the present and past pregnancies, gestational age at the time of diagnosis, and any other medical or obstetrical complication associated was also noted. Peripartum events were analysed for any complications.
Results: Out of 9548 deliveries that took place in King George Hospital, Visakhapatnam during the study period, the incidence of IUFD occurring at >20 weeks of gestation (study group) was 3%. Majority of cases were found in primi gravida, i.e., 53% between age group of 20-25 years and most of the cases were identified at a gestational age of 37-40 weeks, 38%. Hypertensive disorders of pregnancy, preeclampsia 25% found to be the leading maternal causes. Vaginal route was the mode of delivery accounts for 92%. Maternal depression was observed in 4% of cases, however, maternal mortality was found in 0.3% of patients.
Conclusion: Although all the IUFDs are not preventable, the rates can be brought down by the joint efforts at all the levels. Psychological trauma associated with fetal demise is unexplainable. Hence, close antepartum surveillance and hospital deliveries should be encouraged.
KEYWORDS: IUFD, Risk factors, Gravida, Preeclamsia, Vaginal delivery, Depression

I. INTRODUCTION

The death of the fetus is a traumatic event not only to the mother but also to the family and obstetrician. Fetal loss is a sensitive indicator of maternal care during antenatal period. For an obstetrician, documentation of the primary event or factor which has led to the fetal death is of paramount importance [1]. The incidence of intrauterine fetal death (IUFD) reported from various centers of India ranges from 24.4% to 41.9% [2].

Fetal death is defined as death prior to the complete expulsion or extraction from its mother, irrespective of the duration of pregnancy and which is not an induced termination of pregnancy [3]. The IUFD is defined as the death of the fetus that occurs after 20 weeks period of gestation or weight more than 500 grams (according to WHO). The risk of fetal death is known to occur with the extremes of reproductive age, in women with high parity, those with medical problems, smokers, and socially disadvantaged [4].

Identification of causes of IUFD will be helpful in counselling the parents as well as for formulating preventive measures [5]. Causes like chromosomal abnormalities are not totally preventable, whereas causes like post maturity, hypertensive disorders of pregnancy, diabetes, Rh-isoimmunisation are preventable [6].

Risk factors are categorized into fetal, maternal, placental, and cord factors. Several demographic factors are associated with an increased risk of intrauterine fetal death. The incidence of fetal death varies according to

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maternal race. The rate is higher in black compared to white women [7] . The rate of abortion/stillbirth was higher among the higher maternal age (beyond 35 years), as demonstrated by Fretts and colleagues [8]. It has been known that the risks in the first pregnancy are greater than those of the next (2nd and 3rd) pregnancies [9].

Maternal obesity is also associated with hyperlipidemia, which may contribute to increased endothelial dysfunction, platelet aggregation, as well as to clinically significant atherosclerosis. Indeed, in addition to advanced maternal age and low socioeconomic status, the most prevalent risk factor for stillbirth is pre-pregnancy obesity [10].

A history of the previous stillbirth is a well-accepted risk in a subsequent pregnancy. With one stillbirth, the risk of subsequent stillbirth is doubled, and with two previous stillbirths, the risk increased five-fold [11] .

The fetal outcome depends upon the gestational age at which preeclampsia develops [12].

Even though medical care provided to the preeclamptic mothers has resulted in reducing maternal mortality and morbidity, perinatal mortality is still high. Hypertensive disorders complicating pregnancy are common and form one of the deadly triads, along with hemorrhage and infection, results in a large number of maternal deaths [13].

IUFD is due to spasm of uteroplacental circulation leading to reduction in placental blood flow, accidental haemorrhage or acute red infarction, leading to placental insufficiency. In eclampsia, perinatal mortality is very high to the extent of about 30-50%. It is due to acute hypoxia over chronic placental insufficiency. Premature separation placenta is seen in 7 % of cases. Incidence of fetal death and stillbirth is higher in gestational diabetic mothers than in non-diabetic populations [14]. IUFD usually occurs in the last four weeks of pregnancy in diabetes with uncontrolled blood glucose levels and ketoacidosis.

Complications of intrauterine fetal death include infection, emotional liability, and coagulation defects. With this background, the current study was conducted to know the incidence, aetiology and maternal outcome of IUFD cases.

II. MATERIALS AND METHODS

This prospective study was performed in the department of obstetrics and gynecology at King George Hospital, Visakhapatnam between November, 2020 and December, 2021 after ethical clearance from the Institutional Ethics Committee.

A total of 260 cases of IUFD with gestational age >20 weeks irrespective of the gravida were recruited for the study with their written informed consent. When the patient came with complaints of decreased /absent fetal movements with ultrasound showing IUFD were studied using proforma included the following-name, age, unit, registration number, address of the patient, parity, and the maternal demographic details like education, occupation, whether rural or urban are noted. Detailed obstetric history about present complaints and duration, details of antenatal checkups, maternal medical diseases like diabetes, severe preeclampsia, and antiphospholipid antibody syndrome are noted. Detailed past obstetric performances and outcomes were studied. General, systemic and obstetric examinations are done as described in proforma. All cases of intrauterine fetal death with gestational age <20weeks and intrapartum fetal deaths were excluded from the study.

The data were entered in a Microsoft Excel spreadsheet, and analyses were done using Statistical Package for Social Sciences (SPSS) version 26.0. Categorical variables were expressed as frequencies and percentages.

III. RESULTS

Out of 9548 deliveries that took place in K.G.H. during the study period, the incidence of IUFD occurring at >20 weeks of gestation (study group) was 3% (Table 1). In our study, most of the mothers were primi (53%). 32% had second gravida and 15% had more than 2 (Table 1). In the present study, the most common age group affected was 20 - 25 years (52%), followed by 26 - 30 years (38%), 31 - 35 years (9%), and 36 - 40 years (1%) (Table 1).

In the present study, the most common gestational age group was 37 to 40 weeks (38%), followed by 28 to 32 weeks (34%), 33 to 36 weeks (19%), and >40 weeks (5%) (Table 1).

In the present study, the most common antenatal complication was preeclampsia (25%), followed by Anemia (16%), diabetes mellitus (8%), and eclampsia (8%). The cause was unknown in 13% of cases (Table 2).

In the present study, out of 18 babies with congenital anomaly, 34% had anencephaly, 11% had Myelomeningocele, 17% had anencephaly with spina bifida, 5% had gastroschisis, 11% had hydrocephalus, 17% had cleft lip and palate, and 5% had hydrops fetalis (Table 3).

Out of 260 cases studies, 92% of cases were delivered vaginally whereas rest 8% was delivered by caesarean section (Table 4).

Out of studied population, 4% suffered from severe depression, 2 cases each had coagulation defects

and acute renal failure which account for 1%, and sepsis and PPH with 3% and 2% respectively (Table 5) (Fig. 1).

IV. DISCUSSION

Fetal death is one of the unfortunate events in the field of obstetrics. It is distressing when it occurs without warning in a pregnancy that has previously seemed entirely normal. In the present study, the most common age group affected was 20 - 25 years (52%), followed by 26 - 30 years (38%), 31 - 35 years (9%), and 36 - 40 years (1%). In another study, the incidence of 33.9% was observed in the age group of 16-20 years [15]. However, the incidence of 30.76% was claimed by Desai et al. [16].

Parity is an important factor which influences pregnancy outcome. It has been known that the risks in the first pregnancy are greater than those of the next (2nd and 3rd) pregnancies (9). The problem both for mother and fetus increases as the parity exceeds three. Grandmulti has more risks. In the present study, most of the mothers were primi (53%). 32% had second gravida and 15% had more than 2.

In the present study, out of 9548 deliveries that took place during the study period, the incidence of antepartum fetal death occurring at >20 weeks of gestation (study group) was 3%. The incidence of IUFD was 30 per 1000 births in our study. Our results were in accordance with Vaishali et al. [17]. The high incidence was observed in the study by Kumari et al [18] and lower incidence was found in Nayak et al. [19] which account for 64 per 1000 births and 23 per 1000 births respectively.

Pregnant women with subclinical hypothyroidism or thyroid antibodies have an increased risk of complications, especially preeclampsia, perinatal mortality, and miscarriage [20]. The fetal outcome depends upon the gestational age at which preeclampsia develops [12]. Even though medical care provided to the preeclamptic mothers has resulted in reducing maternal mortality and morbidity, perinatal mortality is still high. Hypertensive disorders complicating pregnancy are common and form one of the deadly triads, along with hemorrhage and infection, results in a large number of maternal deaths [13]. Intrauterine fetal death is due to spasm of uteroplacental circulation leading to reduction in placental blood flow, accidental haemorrhage or acute red infarction, leading to placental insufficiency. In eclampsia, perinatal mortality is very high to the extent of about 30-50%. It is due to acute hypoxia over chronic placental insufficiency. In the present study, pre- eclampsia was the major cause of IUFD which accounts for 28%. Similar results were claimed by Vaishali et al. and Kumari et al. however, the major cause of IUFD is abruptio placenta with 21.9% [2, 17].

The most common abnormalities are monosomy X (23%), trisomy 21 (23%), trisomy 18 (21%), and trisomy 13 (8%). Genetic abnormalities may contribute to fetal death in cases without obvious malformations. Single gene disorders such as autosomal recessive conditions, including glycogen storage diseases, other metabolic disorders, and hemoglobinopathies, may cause fetal death [21]. X- linked conditions may cause death in the male fetus. This leads to abnormal placental development and function and has been associated with fetal death and other obstetric abnormalities such as IUGR. In the present study, the incidence of congenital anomalies was 7%. Anencephaly seen in 6 cases, anencephaly with spina bifida & cleft lip and palate were 3 each, myelomeningocoele and hydrocephalus were 2 cases each, gastroschisis and hydrops fetalis were 1 case each. Our results were in accordance with Vaishali et al (17) in which the incidence was 9.4% whereas higher percentage (10.3%) of congenital anomalies was claimed by Kumar et al. [22].

IUFD is a traumatic event for mothers. Mothers with IUFD have the increased risk of experiencing depression, anxiety, sadness, and sorrow for certain period of time after the occurrence. In the present study, the depression was observed in 4% of cases followed by sepsis in 3%, postpartum haemorrhage (PPH) in 2% and with a maternal mortality of 0.3%. According to Heazell et al., mothers who experience IUFD often experience negative psychological symptoms, such as depression, anxiety, posttraumatic stress, panic, phobia, and even the idea of suicide [23].

Mode of delivery after intrauterine fetal death always remained a matter of great concern for the obstetricians. It was well evidenced that the maternal mortality and morbidity was quite higher in caesarean section as compared to vaginal delivery [24]. In the present study, the pregnant women with IUFD were delivered by vaginal route was 92% and 8% by LSCS. Similarly, as reported by Ifnan and Jameel in their study, they claimed the mode of delivery was vaginal in 87.4% and cesarean section in 12.6% of the cases [25].

V. CONCLUSION

Although all the IUFDs are not preventable, the rates can be brought down by the joint efforts at all the levels. Early booking, high risk cases identification, timely intervention is the key approaches to minimize the incidence of IUFD

and prevent its recurrence. Psychological trauma associated with fetal demise is unexplainable. Hence, close antepartum surveillance and hospital deliveries should be encouraged.

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Table 1: Demographic parameters

Age (in years)	Number (n)	Percentage (%)
20-25	135	52
26-30	99	38
31-35	23	9
36-40	3	1
Parity		
Primi	139	53
Second	82	32
>2	39	15
Gestational age (in weeks)		
20-28	10	4
28-32	88	34
33-36	50	19
37-40	98	38
>40	14	5

Table 2: Distribution of cases according to antenatal complications

Cause	Number	Percentage
Preeclampsia	65	25%
Anemia – Severe anemia(<7gm%)-26 Sickle cell anemia-11 Thalasemia-5	42	16%
Unknown	33	13%
Diabetes mellitus	22	8%
Eclampsia	21	8%
Congenital anomaly	18	7%
Abruptio placenta	18	7%
Post-term	14	5%
Hyperpyrexia	10	4%
Isolated Oligohydramnios	8	3%
Infection	8	3%
Rh-negative pregnancy	5	2%
Jaundice	6	2%
Placenta previa	3	1.1%
Chronic renal disease	2	1%
Heart disease	2	1%
Epilepsy	2	1%

Table 3: Type of externally detectable congenital anomaly of babies

Type of congenital anomaly	Number	Percentage
Anencephaly	6	34%
Myelomeningocele	2	11%
Anencephaly with spina bifida	3	17%
Gastroschisis	1	5%
Hydrocephalus	2	11%
Cleft lip and palate	3	17%
Hydrops fetalis	1	5%

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Table 4: Type of delivery in the study population

Type of delivery	Number	Percentage
Vaginal delivery	238	92%
LSCS	22	8%

Table 5: Analysis of Maternal Outcome

Maternal outcome	Number	Percentage
Severe Depression	10	4%
Sepsis	09	3%
PPH	05	2%
Acute renal failure	02	1%
DIC	02	1%
Maternal mortality	01	0.3%

Note: PPH-Postpartum haemorrhage, DIC- Disseminated intravascular coagulation

Fig1: Maternal outcome