International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Patidar S et al. Int J Reprod Contracept Obstet Gynecol. 2025 Feb;14(2):550-554
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20250192

Original Research Article

Profile of intrauterine fetal demise in Central India: is it preventable?

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Received: 02 December 2024
Accepted: 04 January 2025

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ABSTRACT

Background: Intrauterine fetal demise (IUFD) refers to the death of a fetus after 20 weeks of gestation but before or during labor, and it remains a significant obstetric concern worldwide. This study investigates the profile of IUFD in Central India, focusing on its causes, associated maternal factors, and the potential for prevention. Globally, unexplained stillbirth is reported in 76% of cases. The study aims to find the causes of IUFD in this area to help in achieving the goal of less than 12 neonatal deaths.
Methods: A retrospective observational study was conducted over two years from April 2022 to April 2024 at the Department of Obstetrics and Gynecology, R. D. Gardi Medical College, Ujjain, Madhya Pradesh. We included diagnosed cases of pregnancies with IUFD that presented at our hospital. Women before delivery and those who came in emergency with IUFD were included.
Results: 151 cases of IUFD were diagnosed out of 4492 deliveries in the study period of two years; rate of 3.36%. The most common cause of IUFD was preeclampsia (24%) followed by unexplained causes (12%), obstructed and prolonged labor (9.9%). Inspite of tertiary care level of health facility most of these intrauterine deaths were not prevented due to poor antenatal care, late reporting and callous attitude of relatives.
Conclusions: Certain causes of IUFD, such as congenital anomalies, are unavoidable, a significant proportion of cases could be prevented through enhanced maternal health management, improved prenatal screening, and better healthcare access across Central India.

Keywords: Etiology of IUFD, Intrauterine fetal demise, Perinatal death, Preeclampsia

INTRODUCTION

Intrauterine fetal demise (IUFD), is an event in obstetrics, marked by the death of a fetus beyond 20 weeks of gestation. The United States Center for Health Statistics defines a fetal death as the delivery of a fetus showing no sign of life, as indicated by absent breathing, heartbeats, pulsation of the umbilical cord, or definite movements of voluntary muscles, irrespective of the duration of pregnancy.[1] In 2021, an estimated 1.9 million babies were stillborn at 28 weeks of pregnancy or later, with a global stillbirth rate of 13.9 stillbirths per 1,000 total births. These losses, however, are not experienced uniformly.[2] Worldwide, the rate of fetal death varies considerably depending on the quality of medical care available in the country. Globally, every year there are about 2.6 million IUFD cases at or above 28 gestational weeks.[2] The overall rate of stillbirth from the Health Management Information System dataset is about 12.9 per 1000 total births during 2017–2020.Globally, less than 5 percent of stillbirths are recorded.[3] Intrauterine fetal demise is the 5th leading cause of death worldwide. There is currently a limited understanding of the pathophysiology responsible for fetal demise. Globally, unexplained stillbirth is reported in 76% of cases. Considering Indian Scenario, National Family Health Survey (NFHS-5), the perinatal mortality rate for the 5 years preceding the survey in India, 2019-21 is 31.9. Across the years, the rate didn't change much but widely

varied across the states with the lowest Still birth rate in Kerala at 6.2, the highest in Uttar Pradesh at 43.9, and Madhya Pradesh at 34.1.[4] Quantifying incidence of IUFD and identifying gaps in prenatal care are proxy indicator of health care system and standardization of obstetric management. Identifying signs in high-risk pregnancies early and preventing at-risk for IUFD can facilitate timely interventions to prevent adverse outcomes. This information can lead to the development of better screening protocols, diagnostic tools, and management guidelines to optimize prenatal care and improve fetal outcomes. Investigating IUFD provides potential therapeutic interventions aimed at reducing the risk of fetal demise. This may include the development of novel medical procedures, or lifestyle interventions to improve fetal health and reduce the likelihood of IUFD.

Purpose of the study was to take an overall understanding of this tragic condition specially disappointing the women, and relatives and for assuring better result in next pregnancy.

METHODS

A retrospective observational study was conducted over two years and 2 months from April 2022 to June 2024 at the Department of Obstetrics and Gynecology, R. D. Gardi Medical College, Ujjain, Madhya Pradesh. We included diagnosed cases of pregnancies with IUFD and stillbirth that presented at our hospital. Women with stillbirth and IUFD at gestational age more than 24 weeks and less than 42 weeks period of gestation were recruited in the study. Approval from the ethical committee (IEC Ref. No-49/2024) was obtained. Total 151 IUFD cases was studied. Women before delivery and those who came in emergency with stillbirth were included.

IUD diagnosed on clinical examination by absence of fetal heart rate and fetal movements were studied. The age, parity, literacy, socio-economic status, complaints at admission, obstetric history, general physical, systemic obstetric examination, labor status, and relevant investigations were collected from recorded data. All the collected information was filled in a proforma and findings were tabulated in Microsoft excel Worksheet and computer-based analysis was performed using the SPSS (Statistical product and service solutions). The complaints included were period of amenorrhea, duration of labor pains, history of leaking, bleeding per vaginum (PV), decreased or loss of fetal movements. In the present pregnancy details of ante-natal check-ups, parity, abortions, stillbirth, neonatal death, lower segment caesarean section (LSCS), preterm delivery, antepartum hemorrhage (APH) or PIH in a previous pregnancy, eclampsia, severe anemia and other significant illness were noted. Those patients who had attended antenatal clinic atleast thrice before delivery were considered booked cases. The variable considered include maternal factors such as age, parity, antenatal visits (booked or unbooked), probable causes of intrauterine fetal demise, birth weight of the fetus, mode of delivery, gestational age at the time of IUFD.

RESULTS

Total number of deliveries during the study period was 4492. The present study consisted of 151 women with intrauterine fetal death, 3.361% rate of IUFD. The study variables are preeclampsia, gestational diabetes mellitus, infections (viral or bacterial), anemia and fetal growth restriction.

In our study, the age group most frequently linked to intrauterine fetal death is between 18 and 25years. And most of the cases were multigravidas. We found maximum number of IUFD in unbooked cases i.e. 74% which were mainly emergency admissions (Table 1).

Table 1: Characteristics of study subjects.

Maternal parameters		N (%)
Age in years	18-25	99 (65)
	26-30	37(24.5)
	31-35	13 (8.6)
	36-40	02 (1.3)
Parity	Primigravida	63 (41)
	Multigravida	88 (58)
Antenatal visit	Unbooked	113 (74)
	Booked	38 (25)

Table 2: Causes of intrauterine fetal demise.

Causes	N (%)
Severe preeclampsia and preeclampsia	37 (24)
Unexplained	19 (12)
Obstructed and prolonged labor	15 (9.9)
Preterm	13 (8.6)
Fetal distress	13 (8.6)
Eclampsia	09 (5.9)
Infection	09 (5.9)
Abruptio placenta	08 (5.2)
Post maturity	08 (5.2)
Severe oligohydramnios	06 (3.9)
Gestational diabetes	04 (2.6)
Anemia	03 (1.9)
Placenta previa	03 (1.9)
Congenital anomaly	02 (1.3)
Cord prolapse and hand prolapsed	02 (1.3)

The majority of intrauterine fetal demise around 24% was caused due to severe preeclampsia and preeclampsia. Another reason for IUFD in our study was unexplained and found to be 12%. 9.9% of fetal demise caused due to obstructed, and prolonged labor. 8.6% of cases were due to preterm, and fetal distress, 5.9% cases due to eclampsia and infection, 5.2% cases due to abruptio placenta, and post maturity, 3.9% due to severe oligohydramnios, 2.6% cases due to gestational diabetes, 1.9% of cases due to

anemia and placenta previa and 1.3% of cases due to congenital anomaly, cord prolapse and hand prolapse (Table 2).

The majority of IUFD was vaginally delivered about 80%, and 19% were delivered via caesarean section (Table 3). The mode of delivery should be solely according to the interest of the mother. However, ACOG guidelines recommended to terminate pregnancies of intrauterine fetal demise by vaginal delivery. In this study, 39 % of fetal complications had occurred after 37-41.6 weeks gestation, followed by 33.7% seen in 28-34 weeks of gestation, 21% seen in 35-37 weeks of gestation and 5.9% seen below 28 weeks of gestation (Table 4).

Table 3: Mode of delivery.

Mode of delivery	N (%)
Vaginal	122 (80)
Preterm	70
Term	52
Ceaseran section	29 (19)
Preterm	09
Term	20

Table 4: Gestational age at the time of IUFD.

Weeks of gestation	N (%)
<28	09 (5.9)
28-34	51 (33.7)
35-37	32 (21)
>37	59 (39)

DISCUSSION

The World Health Organization (WHO) launched Every Newborn Action Plan (ENAP) in 2014 to provide a road map of strategic actions for ending preventable newborn mortality and stillbirth. By 2030, Every Newborn Action Plan (ENAP) targets a stillbirth rate of ≤12 neonatal deaths per 1000 live births.[5] Despite regular monitoring, the incidence of IUFD remains high. The study aims to find the incidence of IUFD in this area to help in achieving the goal of less than 12 neonatal deaths. Recommending improvement in practices, enhancing prenatal care, and ultimately reducing the incidence of fetal demise will help to improve perinatal deaths. IUFD is a significant global health issue, and its incidence and prevalence vary widely across regions and populations. According to the World Health Organization (WHO), an estimated 2.6 million stillbirths occur globally each year, with the majority occurring in low and middle-income countries.[5] Half of the world's stillbirths are linked to intrapartum complications; most of these deaths could likely be averted with increased access to skilled healthcare.[2] The prevalence and incidence of IUFD in India can vary significantly across different states and regions due to disparities in healthcare infrastructure, access to maternal care services, socioeconomic factors, and cultural practices. In India, the rate of stillbirth rate is reported to be 20-66 per 1000 total birth in different states.[4] Intrauterine fetal death (IUFD) is one of the adverse outcomes of pregnancy that can occur at any trimester. Pregnancy at an advanced age or adolescent pregnancies, parity, multiple gestations, previous cesarean section, previous stillbirth, and post term pregnancy are the main risk factors for fetal demise. Potential causes for IUFDs can be divided into few groups: (a) Maternal diseases, (b) Pathologies related to the fetus, (c) Placental and umbilical cord abnormalities, and (d) Infections. In most cases of intrauterine fetal demise, the cause remains unexplained. It's important to note that stillbirths can result from a variety of factors, and a thorough evaluation is necessary to understand the specific cause in each case.

In our study, 151 intrauterine fetal demise had occurred over 2 years and 2 months. It is expected that, patients more than 35 years of age, would have a higher prevalence of comorbidities such as hypertension, and diabetes, all of which are recognized risk factors for intrauterine fetal demise. However, in our study, maternal age is considered an independent risk factor for intrauterine fetal demise. Maximum number of cases was seen between age group 18-25 years and it is 65% and 1.3% was seen above 36 years of age. Other authors reported IUFD between 18-30 yr age group.[8,10-14]

Parity, or the number of pregnancies a woman has had, can indeed be a risk factor for IUFD. The relationship between parity and IUFD is not directly related and linked by various underlying factors. As shown in our results, 58% of IUFD seen in multigravidas while 44% IUFD in primigravida. Other authors reported maximum number of fetal demise in multigravidas.[8-13]

Etiology

Pregnancy induced hypertension

Preeclampsia (PE) is the most common medical complication in pregnancy and a major cause of fetal morbidity and mortality. As the protocols for management of preeclampsia are not uniform in this area, challenges for treatment still remain a major drawback. Placental microvascular changes in preeclampsia are impaired vascular endothelial function, incomplete uterine artery remodeling, augmented vasoconstriction, vascular oxidative stress, and inflammation. These microvascular changes collectively lead to placental dysfunction, resulting in reduced fetal growth, increased risk of fetal distress. Milder the stage of preeclampsia; milder the effects on placenta and there are less chances of fetal demise. In this study maximum number of fetal demise is in advance form of preeclampsia as patient came at advanced stages which is unpreventable. In our study most common cause of IUFD is preeclampsia and severe preeclampsia which contributes about 24%. Other authors also reported the same findings.[7-14] An Indian author reports high perinatal mortality 28.57% stillbirth in

preeclampsia along with other adverse outcomes like low birth weight, preterm labor, birth asphyxia in year 2009.[15]

Unknown etiology

Globally, unexplained IUFD is reported in 76% of cases.[2,6] The high proportion of IUFD cases highlights the need for further research into the genetics, autopsy and environmental related factors that contribute to fetal death in-utero. Exploring genetic predispositions in both the mother and fetus helps to understand the underlying factors contributing to the fetal demise. Genetic evaluation and fetal autopsy are not available at our centre. Due to lack of facility for evaluation the causes of fetal demise or abnormalities remain unknown. Without evaluation there is significant gap in understanding factors contributing to fetal demise and therefore, future fetal demise cannot be prevented due to unknown causes. Other authors also reported cases of IUFD due to unexplained causes respectively.[10,13] In our study about 12% fetal demise were unexplained.

Infection

Infection as a cause of IUFD may be underrepresented because signs and symptoms of infection are often undetected, and evaluation for infection is often not conducted. Most infection-related stillbirths occurred before 24 weeks of gestation.[16] In our study, 5.9% of IUFD were seen due to infection. 7.62%, 3.33%, 0.44%, of IUFD due to infections are reported by other authors respectively.[7,10,11]

Abnormal labor

Abnormal labor can occur across all stages of labor and is described as a prolonged, protracted, or arrested progress of labor and accounts about 20% of all labors.[17] Extension of the fetal head, occiput posterior or transverse positions, face or brow presentations may contribute to etiologies of abnormal labor progress ultimately leading to IUFD. In our study 9.9% of IUFD was due to obstructed and prolonged labor. 2.2% of IUFD due to prolonged and obstructed labor, 2.42% due to rupture uterus, 3.81% due to abnormal labor is reported by other authors respectively.[7,10]

FGR and placental abnormalities

Fetal growth restriction and placental abnormalities are the most prevalent findings in stillbirth. Most pregnancies with these findings, however, do not result in stillbirth.[18] Placental abnormalities can also be found in stillbirths without evidence of impaired growth. The risk of IUFD is relative to the degree of growth restriction, with the highest IUFD risk for those delivering the most growth-restricted fetuses.[19] In our study placental abruption was found 5.2%, placenta previa 1.9% and 8.6% fetal demise was seen due to prematurity. 8.33% placenta previa, 6.67% abruption and 8.33% IUFD due to prematurity by author.[11] 11.76% abruption, 1.17% placenta previa, 8.23% FGR cases by author.[13] 7.62% FGR, 3.81% placenta previa by author [10].19.87% abruption, placenta previa 1.99% by author.[7] 12% APH, 2.8% prematurity, 5.2% FGR by author.[9]

Gestational diabetes

Association of diabetes and IUFD is reported differently by different authors. The risk of a stillbirth was increased by gestational diabetes; however, it is not clearly evident. It is well-recognized that pregnancies among women with pre-existing diabetes carry a four- to fivefold increased risk of stillbirth compared with the general obstetric population.[20,21] In our study 2.6% cases of fetal demise was seen due to gestational diabetes. 0.22% and 1.17% of IUFD due to GDM by author respectively.[7,13]

Most recent publication based on data of National family health survey-5 also reports lack of awareness for facility based antenatal care and parturition, which results into adverse pregnancy outcome in form of IUFD. Our data is comparable to this finding as the setting is same.[22]

Implication

Inspite of the advances in diagnostic modalities and awareness among the population about hospital delivery, the rate of IUFD is still on the higher side which is unacceptable but can be prevented in case of preeclampsia, gestational diabetes, anemia, maternal bacterial and viral infections. However, there are still cases where IUFD occurs due to chromosomal abnormalities, congenital anomalies, placental abnormalities which is beyond prediction and control due to limited diagnostic tools and socioeconomic barriers. A multifaceted approach is essential to address the preventable causes, including improving access to healthcare, enhancing maternal education, and promoting healthy behaviors. Simultaneously, continued research into the unpreventable factors is crucial for understanding and potentially mitigating their impact on fetal outcomes. By focusing on both aspects, we can work towards reducing the incidence of IUFD and improving overall maternal and fetal health.

CONCLUSION

The study showed that majority of cause of intrauterine fetal demise were due to preeclampsia and eclampsia followed by unexplained etiology. Major contribution was by emergency admission rather than planned admission in patients who received antenatal care. There are many preventable factors associated with intrauterine fetal demise but unpreventable etiologies also play a significant role.

ACKNOWLEDGEMENTS

Authors would like to thank Dr. V. K. Mahadik, Medical Director, R. D. Gardi Medical College, Ujjain for allowing

us to conduct the study. We thank other departmental member for their constant support and guidance.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee (IEC Ref. No- 49/2024)

REFERENCES

1. Martin JA, Hoyert DL. The national fetal death file. Seminars in Perinatology. 2002;26(1):3-11.
2. UNICEF. Stillbirths and stillbirth rates. UNICEF DATA, 2020. Available at: https://data.unicef.org/topic/child-survival/stillbirths/. Accessed 01 May 2024.
3. Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, et al. Lancet Stillbirth Epidemiology investigator group. Stillbirths: rates, risk factors, and acceleration towards 2030. Lancet. 2016;387(10018):587-603.
4. International Institute for Population Sciences (IIPS) and ICF. National Family Health Survey (NFHS-5), 2019-21, 2021. Available at: https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf. Accessed 01 May 2024.
5. World Health Organization. Every Newborn: an action plan to end preventable deaths. Available at: https://www.who.int/maternal_child_adolescent/documents/every-newborn-action-plan/en/. Accessed 01 May 2024.
6. Man J, Hutchinson JC, Heazell AE, Ashworth M, Levine S, Sebire NJ. Stillbirth and intrauterine fetal death: factors affecting determination of cause of death at autopsy. Ultrasound Obstet Gynecol. 2016;48(5):566-73.
7. Katti K, Anupama Rani V, Umashankar Km, Dharmavijaya Mn, Clinical study of intra uterine fetal death. Indian J Obstet Gynecol Res. 2017;4(4):404-6.
8. Jovanovic I, Ivanovic K, Kostic S, Tadic J, Dugalic S, Petronijevic M, Gojnic M, et al. Intrauterine Fetal Death in Term Pregnancy-A Single Tertiary Clinic Study. Life (Basel). 2023;13(12):2320.
9. Sharma S, Sidhu H, Kaur S. Analytical study of intrauterine fetal death cases and associated maternal conditions. Int J Appl Basic Med Res. 2016;6(1):11-3.
10. Choudhary A, Gupta V. Epidemiology of intrauterine fetal deaths: a study in tertiary referral centre in Uttarakhand. IOSR J Dent Med Sci. 2014;13(3):03-6.
11. Shravya Monica K, Rathnamma P. A retrospective study of intrauterine fetal demise in a tertiary care center. Int J Reproduct Contracept Obstetr Gynecol. 2023;12(3):590-4.
12. Gupta DrS, Rani DrK, Najam DR. Intrauterine fetal demise: A retrospective study in tertiary care center. Int J Clin Obstetr Gynaecol. 2022;6(2):18-21.
13. Saha D, Kurude VN, Sharvari Mundhe. A study of intrauterine fetal death in a tertiary care hospital. Int J Clin Obstetr Gynaecol. 2019;8(7):2647-7.
14. Bhatia T, Jayshree Narshetty, Priya Bagade, Kulkarni A, Rai M. Clinical study of cases of intrauterine foetal death in a tertiary centre. Int J Res Medi Sci. 2016;800-5.
15. Singhal SR, Deepika A, Nanda S. Maternal and perinatal outcome in severe pre-eclampsia and eclampsia. South Asian Fede Obstetr Gynecol. 2009;1(3):25-8.
16. Page JM, Bardsley T, Thorsten V, Allshouse AA, Varner MW, Debbink MP, et al. Stillbirth associated with infection in a diverse U.S. Cohort. Obstet Gynecol. 2019;134(6):1187-96.
17. Clark SL, Garite TJ, Hamilton EF, Belfort MA, Hankins GD. "Doing something" about the cesarean delivery rate. Am J Obstet Gynecol. 2018;219(3):267-71.
18. Flenady V, Koopmans L, Middleton P, Frøen JF, Smith GC, Gibbons K, et al. Major risk factors for stillbirth in high-income countries: a systematic review and meta-analysis. Lancet. 2011;377(9774):1331-40.
19. Malacova E, Regan A, Nassar N, Raynes-Greenow C, Leonard H, Srinivasjois R, et al. Risk of stillbirth, preterm delivery, and fetal growth restriction following exposure in a previous birth: systematic review and meta-analysis. BJOG. 2018;125(2):183-92.
20. Mathiesen ER, Ringholm L, Damm P. Stillbirth in diabetic pregnancies. Best Pract Res Clin Obstet Gynaecol. 2011;25(1):105-111.
21. Tennant PW, Glinianaia SV, Bilous RW, Rankin J, Bell R. Pre-existing diabetes, maternal glycated haemoglobin, and the risks of fetal and infant death: a population-based study. Diabetologia. 2014;57(2):285-94.
22. Swain PK, Jena A, Behera R. Associated risk factors of adverse pregnancy outcomes among women of reproductive age in India: a study based on NFHS-5. Demography India. 2024;53(1):1.

Cite this article as: Patidar S, Mahadik K. Profile of intrauterine fetal demise in Central India: is it preventable?. Int J Reprod Contracept Obstet Gynecol 2025;14:550-4.