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**Original Research Article**

# Study of Maternal and Fetal Factors in Fetal Lesions: Insights from Fetal Autopsies

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## Abstract

Fetal death/Intra uterine death (IUD) is a significant adverse pregnancy outcome, particularly prevalent in low- and middle-income countries. It is also a good indicator of quality of healthcare available. Fetal autopsy is often required to determine the cause of intrauterine death or miscarriages, provide recurrence risk, and is known to alter the final diagnosis and genetic counseling. ***Aim:*** To study the maternal and fetal factors in fetal autopsy lesions. To know the prevalence of various fetal abnormalities in IUD. ***Material and methods:*** The present study was a retrospective observational study conducted in the Department of Pathology at Dr. BVP Rural Medical College, Loni, over a duration of 5 years. A total of 78 cases were included, with data collected on the mother's age, gestational age, fetal gender, weight, and other relevant details, alongside records of fetal autopsies. Special attention was given to identifying organ abnormalities in the fetuses. The collected data was compiled in Microsoft Excel, and the analysis was carried out using Openepi version 3.2.1 software. ***Results:*** The study found that mean maternal age was 24.8+ 4.5 years, ranging between 18 to 38 years. Mean gestational age was 21.7 +4 weeks. It was seen that among total 78 cases, 40 were males, 30 were females, 6 fetuses were macerated and 2 fetus gender was ambiguous. ***Conclusion:*** The study shows a varied distribution of fetal characteristics, with male fetuses being more common and cardiac abnormalities being the most prevalent. These findings emphasize the diverse nature of fetal lesions and their potential effects on fetal development, influenced by gestational age and maternal conditions.

**Keywords**: Maternal, Fetal, autopsies.



## INTRODUCTION

Fetal death refers to the death of a fetus before it is fully expelled or extracted from the mother, regardless of the pregnancy duration. Prior to 9 weeks of gestation, the developing fetus is termed an embryo [1]. Intrauterine death (IUD) or stillbirth is a major contributor to perinatal mortality and serves as a crucial indicator of pregnancy loss and the quality of healthcare services. The incidence of stillbirth reflects the effectiveness of prenatal care, highlighting areas for improvement in maternal and fetal health management [2].

Autopsy has been an essential tool in medicine since the 15th century, providing valuable insights into the causes of death and improving clinical knowledge. Neonatal autopsy plays a critical role in understanding the cause of death in infants, offering families essential information and closure after the loss of a child. Genetic conditions or obstetric factors of relevance to future pregnancies may also be identified [3]. It can significantly aid the grieving process by providing answers to questions regarding the prenatal and delivery events, helping parents understand the circumstances surrounding the loss. Autopsy findings also contribute to advancements in medical practices and can help identify preventable causes, ultimately improving the management of pregnancies and neonatal care [4-6].

**Aim:**

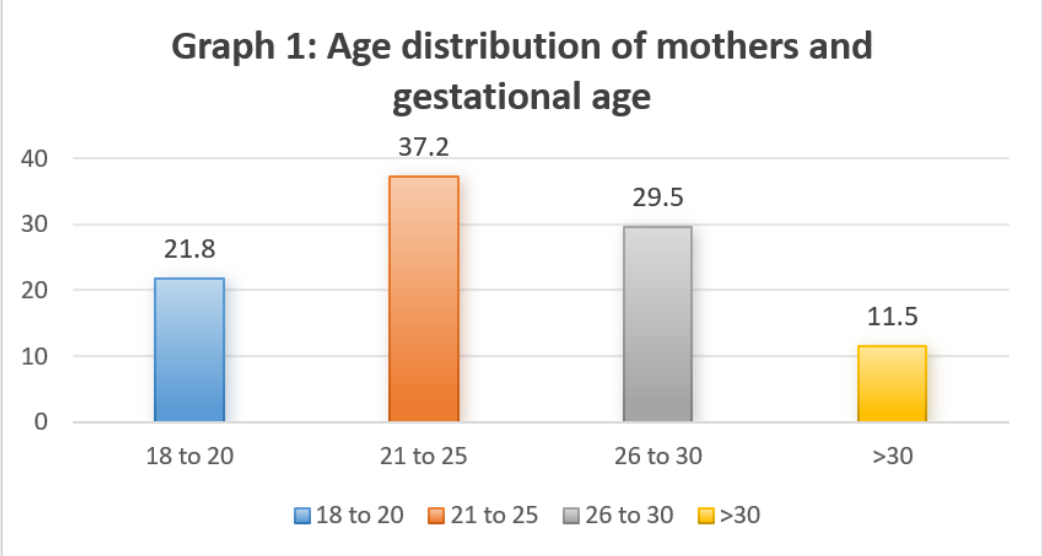
1. To study the maternal and foetal factors in foetal autopsy lesions.
2. To know the prevalence of various foetal abnormalities in the study.

## MATERIAL AND METHODS

The present study was a retrospective observational study carried out over a period of 5 years under the Department of Pathology (Cytology and autopsy section) at Dr. BVP Rural Medical College, Loni. A total of 78 cases were included in the study, with a comprehensive data collection process that involved gathering various maternal and fetal characteristics. The information collected included the mother's age, gestational age, fetal gender, and birth weight. Additionally, records of fetal autopsies were reviewed, focusing particularly on the identification of any organ abnormalities or pathological findings that could shed light on the causes of fetal morbidity or mortality. The study aimed to analyze these abnormalities and their potential correlation with maternal factors and outcomes. The data collected from the 78 cases were systematically compiled and organized using Microsoft Excel, ensuring that all relevant variables were clearly documented and accessible for analysis. The analysis of the data was carried out using Openepi version 3.2.1 software, a statistical tool commonly used for epidemiological studies. This software allowed for the application of appropriate statistical methods to assess the relationships between maternal and fetal factors and identify any significant patterns or trends within the data. The study's design and approach allowed for a thorough investigation of fetal outcomes, with particular emphasis on understanding the prevalence and types of organ abnormalities observed in the fetuses.

## RESULTS

The study found that mean maternal age was 24.8± 4.5 years, ranging between 18 to 38 years.




The mean gestational age in the study was 21.7 ± 4 weeks, indicating that the majority of the cases were in the early stages of pregnancy. The standard deviation of 4 weeks suggests some variability in the gestational age of the cases, with some patients being slightly earlier or later than the mean. This information is important for understanding the stage of pregnancy at which the complications or abnormalities were identified, as early gestational age can influence both maternal and fetal outcomes.

**Table 1: Gestational age in weeks**

| Gestational age in weeks | Frequency | Percentage |
|---|---|---|
| <24 | 63 | 80.8 |
| 24 to 36 | 13 | 16.7 |
| >36 | 2 | 2.6 |
| Total | 78 | 100 |

It was seen that among total 78 cases, 40 were males, 30 were females, 6 fetus were macerated and 2 fetus gender was ambiguous.

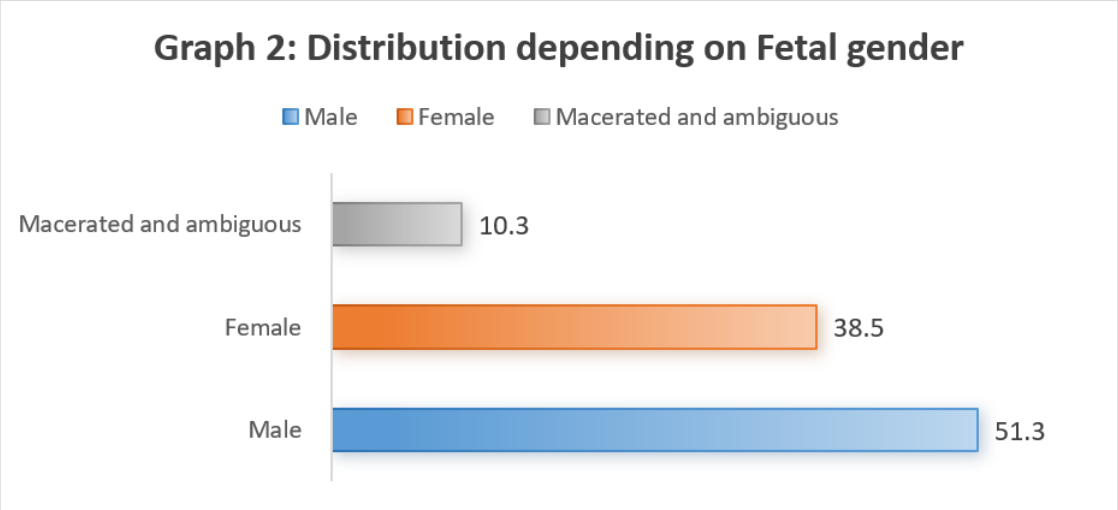



**Table 2: Foetal autopsy findings**

| Abnormality found | Frequency | Percentage |
|---|---|---|
| Cardiac abnormality | 31 | 39.7 |
| Neural and spinal abnormality | 25 | 32.1 |
| Renal abnormality | 20 | 25.6 |
| Lung abnormality | 16 | 20.5 |
| GIT abnormality | 7 | 9 |
| Limb abnormality | 7 | 9 |
| Hematopoietic abnormality | 5 | 6.4 |
| Facial abnormality | 4 | 5.1 |
| Autolysis | 3 | 3.8 |
| Developmental abnormality | 3 | 3.8 |
| Genital abnormality | 2 | 2.6 |

Majority cases 39.7% had cardiac abnormalities, followed by neural and spinal abnormality 32.1% and least was genital abnormality 2.6%.

The data highlights the prevalence of various abnormalities within the population, with cardiac abnormalities being the most frequently observed at 39.7%, followed by neural and spinal abnormalities at 32.1%. Renal and lung abnormalities are also significant, occurring in 25.6% and 20.5% of cases, respectively. Gastrointestinal (GIT) and limb abnormalities are less common, each affecting 9% of cases, while hematopoietic abnormalities are present in 6.4% of cases. Facial abnormalities are noted in 5.1% of cases, and both autolysis (cellular breakdown) and developmental abnormalities are found in 3.8% of cases. Genital abnormalities are the least prevalent, occurring in 2.6% of the population.

## DISCUSSION

Present study showed mean maternal age was 24.8± 4.5 years, ranging between 18 to 38 years and mean gestational age was 21.7 ±4 weeks. In present study 40 fetuses were males, 30 were females, 6 were macerated and in 2 fetuses, gender was ambiguous. Study by Fatima J et al[1] showed that mean maternal age was 24.4 years. Study by JKA, Harini Devi *et al.,* [7] showed that mean age of mothers was 25 (range, 21–30) years. The gestational age of fetuses at the time of termination/intrauterine demise ranged from 12 weeks to 18 weeks and showed female predominance.

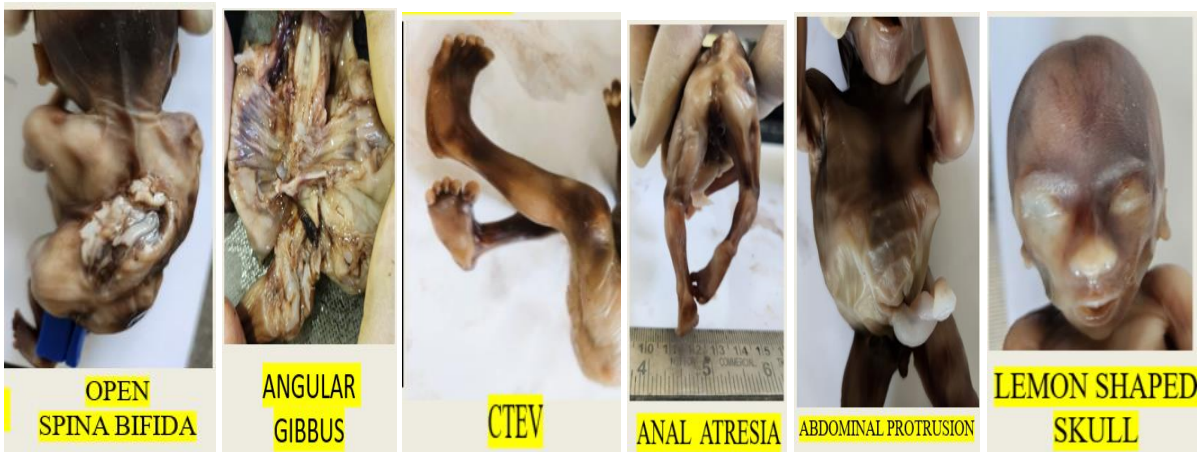
In present study majority cases 39.7% had cardiac abnormalities, followed by neural and spinal abnormality 32.1% and least was genital abnormality 2.6%. Study by Fatima J *et al.,* [1] showed that 28.6% had congenital anomalies. In study by JKA, Harini Devi *et al.,* [7] the fetuses revealed hydrops in three of the cases. This anomaly was observed most frequently in the limb structures, followed by systemic anomalies.

Cho JY *et al.,* [8] showed that many fetal tumors have different clinical and imaging features compared with pediatric tumors. Although several fetal tumors may mimic other common anomalies, some specific imaging features may carry early accurate diagnosis of fetal tumors, which may alter the prenatal management of a pregnancy and the mode of delivery, and facilitate immediate postnatal treatment.

## CONCLUSION

In relation to foetal lesions, the study shows a varied distribution of foetal characteristics, with a predominance of male fetuses and cardiac abnormalities.

The findings highlight the diverse nature of foetal lesions and their potential impact on foetal development across different gestational ages and maternal conditions.

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