



## Original Article

# Determinations of antepartum fetal death

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### Abstract

**Objectives:** This study was conducted to analyze the maternal and fetal etiologies of intrauterine fetal death, and to assess the diagnostic accuracy of an antenatal ultrasound, in the year 2007-2008, at Lady Goschen Hospital, Mangalore. **Methods:** The study is a prospective, non interventional, observational study, with 28 women as the subjects. Women admitted to the labor room with intrauterine fetal death, were counseled for fetal autopsy after delivery. Written and informed consent was taken from the couple for the autopsy examination, and fetus with the placenta was sent to Kasturba Medical College, Pathology Department for histopathology. **Results:** Peak incidence was seen among the women 25-30 years of age with most of them being gravida two (46.43%). Maternal hypertensive disorders (28.56%) and fetal anomalies (32.14%) were the most common associations with fetal death. Unexplained etiology of fetal death was associated with gestational age of 36 weeks or more (75%), mostly in primigravida (43%), with fewer than four antenatal visits. Ultrasound was able to detect 55.55% of fetal anomalies antenatally. **Conclusions:** Fetal autopsy is a must in accurately diagnosing the cause of fetal death. This has a bearing on the future pregnancy with respect to risks of recurrence.

**Key words:** fetal autopsy, intrauterine death, antenatal ultrasound

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### Introduction:

Perinatal deaths complicate 1.5% of all stillbirths, and such losses are often difficult for the patient and the physician to understand. Antepartum fetal death occurs 10 times more frequently than sudden infant deaths. It may provoke self recrimination and criticism of the

physician. Once a couple faces a fetal demise there are always concerns about its recurrence risks. A perinatal autopsy can provide an explanation for the death, and reveal a specific disorder. Autopsy can change a clinical diagnosis, or add significantly to it.

The ignorance about the benefits and cost constraints, unfortunately lead to reluctance towards autopsy. The most common cause of perinatal death continues to be congenital malformations, accounting for 25-40% of the cases. Various other maternal and fetal causes have also been elucidated. Antenatal ultrasonography has developed in the recent years; however it continues to lag behind a complete fetal autopsy in accurately diagnosing the cause of fetal death.

The perinatal mortality rate has been defined by the

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National Centre for Health Statistics (NCHS), as the number of late fetal deaths (fetal death of 28 weeks gestation or more) plus early neonatal deaths that is deaths of infants 0 to 6 days of age, per 1000 live births plus fetal deaths. A live birth is the complete expulsion or extraction of the products of conception from its mother, irrespective of the duration of pregnancy, that after separation breathes or shows any evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of the voluntary muscles, whether or not the umbilical cord has been cut or placenta is attached; each product of such a birth is considered live born.

Many studies have been conducted in the past providing enough support to the performance of an autopsy. A study<sup>1</sup> done in 1995 showed that autopsy added significantly to the clinical diagnosis in 44.7% of the cases. In 55.3% cases the antenatal diagnosis was confirmed on autopsy. In 1996 in an Indian study done by Rajashekar et al<sup>2</sup>, it was found that autopsy added to or changed the preexisting diagnosis in as many as 59.5% of the cases. This study has tried to analyze the causes of in utero fetal demise, and the utility of perinatal autopsy in identifying the cause of death. The diagnostic accuracy of an antenatal ultrasound is hence assessed, comparing it with the autopsy findings. Many times the couple hesitates to subject the fetus to a histopathological examination. It is our duty to counsel them in the right way. It should be explained to the parent that, autopsy not only reveals the cause of death in the present pregnancy, but also helps in assessing the recurrence risks for future pregnancies.

**Methods**

This study is a prospective, non interventional, observational study in which women attending the antenatal clinic at Lady Goschen Hospital, in the year 2007 to 2008, diagnosed as having intrauterine fetal demise, with gestational age of 20 weeks or more were included. If the correct gestational age was not known, fetal weight of 500g or more was taken as the inclusion criteria. After the delivery, informed and written consent was taken from the woman and her husband or guardian, for a fetal autopsy procedure. They were told that such a procedure will help diagnose the cause of fetal death, and also will be useful in assessing the risk of recurrence. Twenty eight such couples gave consent for autopsy in this study.

Once the consent was obtained, fetus with the placenta was sent to the Pathology Department at Kasturba Medical College, Mangalore. All autopsies were conducted by the same doctor who received the specimens. Once the reports were obtained, they were analyzed.

**Results**

Of the women studied in the present study, maximum number was found to be between 25 to 30 years of age (35.72%), as shown in Table 1. Table 2 shows that most of the women studied were gravida two (46.43%). Table 3 shows that maternal hypertensive disorders were the most common maternal factor associated with fetal death, in 28.56% of the women. Maximum number of fetuses under study was between 26 to 38 weeks of gestation (57.14%) as seen in Table 4.

**Table 3.**  
**Maternal antenatal complications**

**Table 1.**  
**Age distribution**

Age	No. of patients	Percentage (%)
<20	0	0
20-25	8	28.57
25-30	10	35.72
30-35	8	28.57
35-40	1	3.57
40-45	1	3.57
Total	28	100

**Table 2.**  
**Parity**

Obstetric score	No. of patients	Percentage (%)
Primi	11	39.29
G2	13	46.43
G3	1	3.57
G4	1	3.57
G5	1	3.57
G6	1	3.57
Total	28	100

<b>Maternal complications</b>	<b>No. of patients</b>	<b>Percentage (%)</b>
Preeclampsia	4	14.28
Abruption	3	10.71
Diabetes mellitus	3	10.71
Oligohydramnios	2	7.14
Gestational hypertension	2	7.14
PROM	1	3.57
Eclampsia	1	3.57
Polyhydramnios	1	3.57
Chronic hypertension	1	3.57
Epilepsy	1	3.57
Chicken pox	1	3.57
Malaria	1	3.57
Trauma	0	0

Table 5 shows that unexplained cause of death was the most common finding on histopathological examination

**Table 4.**  
**Gestational age**

<b>Gestational age</b>	<b>No. of patients</b>	<b>Percentage (%)</b>
20-26 weeks	7	25.00
26-32 weeks	8	28.57
32-38 weeks	8	28.57
38 or more	5	17.86
Total	28	100

(57.14%). Various fetal anomalies were detected on au-

topsy which were not identified on ultrasound, such as iniencephaly, absent corpus callosum, features of Turner's syndrome such as, cystic hygroma and webbing of neck (could not be proved conclusively due to financial reasons) and congenital cystic adenomatoid malformation of the lung. The latter was falsely seen on ultrasound as congenital diaphragmatic hernia. Preeclampsia was the commonest medical disorder associated with IUFD in 14.28%, followed by Diabetes Mellitus in 10.71%, and Oligohydramnios in 7.14%.

Among the women in whom autopsy showed a fetal anomaly, ultrasound was found to detect the same in 55.55%.

### **Discussion:**

Fetal autopsy significantly contributes to the diagnosis of intrauterine fetal death. Saller et al<sup>1</sup> showed that autopsy added significantly to the clinical diagnosis in 44.7% of the subjects. Faye-Petersen<sup>3</sup> in a similar study, showed that fetal histopathological diagnosis contributed significantly to the preexisting diagnosis in 51% of the women. In yet another study conducted by Kaiser et al<sup>4</sup>, it was seen that fetal autopsy contributed additional points to the clinical diagnosis in 51% of the women under study. In an Indian study done by Sankar<sup>5</sup>, in 37% of the women similar findings were seen. The present study is also closely following the norm. In as many as 58% of the women studied, autopsy added significantly to the diagnosis. This shows that accurate diagnosis requires a complete systematic autopsy.

Fetal autopsy confirmed the antenatal diagnosis in 17%

**Table 5.**  
**Histopathology report**

<b>Histopathology report</b>	<b>No. of patients</b>	<b>Percentage (%)</b>
Preeclamptic change	5	17.85
Hypoplastic organs	2	7.14
Congenital cystic adenomatoid malformation of lungs	2	7.14
Anencephaly	1	3.57
Iniencephaly	1	3.57
Absent corpus callosum	1	3.57
Turner's syndrome	1	3.57
Hydrocephaly	1	3.57
Unexplained	16	57.14

of the women in the present study. However this figure was higher for the reference studies taken into consideration. For Saller et al<sup>1</sup> autopsy was found to confirm the antenatal diagnosis in 55.3% of the subjects. In the study by Faye-Petersen<sup>3</sup>, similar findings were seen in 48.9% women. In another study by Kaiser et al<sup>4</sup>, in 48.7% of the women antenatal diagnosis was confirmed by an autopsy.

This difference could be attributed to the better antenatal diagnostic facilities available in the reference studies.

The present study being done in a resource limited setting lagged behind in such technological advances.

Fetal anomalies were found to be the cause of death in 9% of the women in the present study (excluding congenital cystic adenomatoid malformation of lung which was not studied in the reference study), which was comparable to the findings of Rajashekar et al<sup>2</sup> (12%) which is an Indian study.

Maternal age above 35 years was not found to be a significant contributing factor towards unexplained fetal death in the present study. This was in contrast to the studies done by Fretts<sup>6</sup> and Huang et al<sup>7</sup>. This could be because only two women in the present study were above 35 years of age. Moreover Indian women complete their family at an early age. Bigger sample size is needed to comment on the association of unexplained fetal death and maternal age.

Unexplained fetal death was found to be associated with primiparity in 43% of the cases, and gestational age of 36 weeks or more with fewer than four antenatal visits in 62% of the cases. Similar results were obtained by a study done by Huang et al<sup>7</sup>. Birth weight ratio (ratio of actual birth weight to expected birth weight at the gestational age), was not found to be a contributor towards unexplained fetal death.

Maternal hypertensive disorders were found to be significantly associated with intrauterine fetal death in 28.56% of the women. Similar results were seen in a study done by Korejo et al<sup>8</sup>, where hypertensive disorders

contributed to 24% of the fetal deaths.

## Conclusion:

Most common maternal cause of intrauterine fetal death in the present study is hypertensive disorders. Most common fetal cause associated with intrauterine demise is fetal anomaly. Fetal autopsy is a must in all cases of intrauterine fetal death, whether explained or unexplained, both to know the cause and to determine the prognosis for the future

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