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CORRELATION OF AUTOPSY AND SONOGRAPHY FINDINGS IN FETAL ANOMALIES

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ABSTRACT

Background: There is no risk to the mother or foetus when a pregnant woman has ultrasound testing. As a scientific examination of the anatomy, ultrasonography evaluates the characteristics of every system and every organ that is connected to it.

Aim: The current study's goals were to identify any discrepancies between the autopsy and ultrasound results in the foetus with congenital defects, as well as to compare and correlate the data.

Methods: Assessments were made for imperforate anal defects, limb abnormalities, club foot, diaphragmatic hernia, cleft lip, cleft palate, and omphalocele, among other gastrointestinal anomalies, in all of the foetuses that were included.

Results: Based on a comparison of autopsy and ultrasound data, the foetus was classified into four groups. The current study suggests that dietary practices and socioeconomic position have a significant impact on autopsy and ultrasonography.

Conclusion: Early detection of congenital deformities and parent awareness can aid in the prompt MTP (Medical Termination of Pregnancy) and prevention of these deformities in future pregnancies.

Keywords: Sonography, autopsy, classification, foetal abnormalities, congenital deformities

INTRODUCTION

Prenatal scans are safe for both the mother and the foetus and are often performed between weeks 6 and 20 of pregnancy. Prenatal scans, as these ultrasonography tests are called, are used to identify the embryo's defects. This can also assist the gynaecologist in planning a prompt medical termination of pregnancy (MTP) and avert similar deformities in future pregnancies.1

Ultrasonography is a part of an anatomic survey that evaluates all the organs connected to each system as well as exterior aspects without causing any harm to the mother or foetus.2 Foetal abnormalities identified by ultrasonography might be classified as substantial or mild. In most cases, the ultrasonographic examination misses minor irregularities. The incidence of these small abnormalities is close to 14% of all ultrasonography scans that are reported and discovered. An ultrasonography examination may or may not reveal these small irregularities. Major malformations, on the other hand, have the potential to be deadly to the foetus, whereas these minor defects have no effect on the fetus's survival or wellbeing.3

The goal of the current study was to evaluate the relationship between sex ratio and foetal abnormalities, as well as to identify discrepancies in the autopsy and ultrasound results in the foetus with congenital malformations.

MATERIALS AND METHODS

In order to analyse and link the autopsy and ultrasound results in the foetus with congenital malformations, as well as to identify opposing findings, the current descriptive clinical investigation was carried out to evaluate the sex ratio and foetal anomalies. The study was carried out at weat Bengal hospital with approval from the relevant ethical committee. The individuals who visited the Institute's outpatient obstetrics and gynecology department made up the study population. All study participants gave their informed permission after being fully told about the study's design.

A total of 48 prenatal ultrasonography results from pregnant women who had embryologic abnormalities detected during the scan and who had either undergone medical pregnancy termination or had foetal materials taken for autopsy after delivery were included in the research. Among the specimens gathered was the placenta. Professionals with expertise in the discipline performed all autopsy at the institute.

The study's inclusion criteria included participants whose foetuses were discovered to be embryologically deficient on ultrasonography and whose postmortem results corroborated this finding, as well as those subjects who agreed to submit the results of their ultrasound scans. Subjects with foetal abnormalities for which there were no ultrasound scans and those who refused to give their ultrasound scans were the study's exclusion criteria.

Following the research subjects' final inclusion, each subject underwent a medical examination and a thorough history was taken. All of the participants' demographic information was documented, including the mother's age, any family history of embryologic abnormalities, abortions, stillbirths, exposure to chemicals or radiation, dietary practices, use of medications during pregnancy, socioeconomic status, and length of gestation.

Every participant was monitored until the end of the pregnancy or the time of birth, whichever came first. The foetus was recovered after birth or ejection. The fetus's outward appearance was compared with the ultrasonography records. The foetus and placenta were removed between weeks 16 and 20 of pregnancy, and they were preserved in 10% formalin. For the fetus's autopsy, forceps, scissors, and a knife were used.

Using SPSS software version 21 (Chicago, IL, USA) for statistical assessment and one-way ANOVA and t-test for result formulation, the gathered data were examined. The data were presented as a mean, standard deviation, percentage, and number. At $p<0.05$, the significance threshold was maintained.

RESULTS

In order to analyse and link the autopsy and ultrasound results in the foetus with congenital malformations, as well as to identify opposing findings, the current descriptive clinical investigation was carried out to evaluate the sex ratio and foetal anomalies. A total of 48 prenatal ultrasonography results from pregnant women who had embryologic abnormalities detected during the scan and who had either undergone medical pregnancy termination or had foetal materials taken for autopsy after delivery were included in the research.

Based on the following criteria, the correlation between prenatal findings, ultrasound results, and foetal autopsy was categorised into the following groups.4

- Category A: The autopsy and ultrasound results were both concurred.
- Category B: Extra information on other abnormalities found.
- Category C: Only a few ultrasound results were disclosed by the foetal autopsy.
- Category D: The results of the autopsy and the ultrasound did not correspond.

When the limb abnormalities in the research participants were evaluated, it was found that 6.25% (n=3) of the 48 specimens evaluated had skeletal dysplasia, which resulted in the shortening of both the upper and lower segments of both limbs (Figure 1a).

Of the research participants and foetuses, 31.25% (n=15) had Talipes Equino Varus. 4.16% (n=2) of the research participants had an omphalocele (Figure 1b). It was linked to a short neck, edoema, scoliosis, a horseshoe-shaped kidney, fused toes, and the disappearance of the right lower leg. In contrast, the other two cases, as listed in Table 1, simply had an omphalocele. In addition, 4.16% (n=2) of research participants had cleft palates, and one of them also had a small phallus and an ill-formed nose (Table 1). The current study's findings also indicate that a diaphragmatic hernia was seen in three of the participants. As shown in table 2, diaphragmatic hernias affecting the right side were observed in 2.08% (n=1) of the study individuals, whereas those affecting the left side were observed in 4.16% (n=2) of the patients.

When the research subjects' foetuses were examined for the existence of imperforate anus, it was discovered that 8.33% (n=4) of the foetuses had the condition, while the remaining 91.66% (n=44) study subjects had no incidence of the imperforate anus (Table 2). As shown in Table 2, the assessment of the single palmer presence in the study

foetus revealed that single palmer absence was observed in 97.91% (n=47) research subjects, whereas single palmer in conjunction with two lobbed lungs was observed in 2.08% (n=1) study subjects.

DISCUSSION

In order to analyse and link the autopsy and ultrasound results in the foetus with congenital malformations, as well as to identify opposing findings, the current descriptive clinical investigation was carried out to evaluate the sex ratio and foetal anomalies. A total of 48 prenatal ultrasonography results from pregnant women who had embryologic abnormalities detected during the scan and who had either undergone medical pregnancy termination or had foetal materials taken for autopsy after delivery were included in the research.
After limb abnormalities in the research participants were evaluated, it was observed that 6.25% (n=3) of the 48 specimens evaluated had skeletal dysplasia, which resulted in the shortening of both the upper and lower segments of both limbs.

Of the research participants and foetuses, 31.25% (n=15) had Talipes Equino Varus. Of the research individuals, 4.16% (n=2) had omphaloceles. While the other two examples simply contain an omphalocele, it was linked to a horseshoe-shaped kidney, fused toes, scoliosis, lack of the right lower leg, edoema, and a short neck. In addition, 4.16% (n=2) of the research participants had cleft palates, and one of them also had a small phallus and an ill-formed nose. These findings corroborated those of studies by Valerie D. et al. (2011) and Nayab A. et al. (2010), who both found a comparable incidence of limb anomalies on foetus evaluation.

The current study's findings also indicate that a diaphragmatic hernia was seen in three of the participants. As shown in table 2, diaphragmatic hernias affecting the right side were observed in 2.08% (n=1) of the study individuals, whereas those affecting the left side were observed in 4.16% (n=2) of the patients. These findings concurred with those of Vimercati A et al. (2012) and Mohan H et al. (2004), who reported finding evidence of a diaphragmatic hernia during postmortem and ultrasonography on the abnormally developing foetus.

When the study subjects' foetuses were examined for the existence of imperforate anus, it was observed that 8.33% (n=4) of the foetuses had the condition, while the remaining 91.66% (n=44) study subjects had no incidence of the imperforate anus (Table 2). When the single palmer in the foetus of the current study was evaluated, the findings revealed that 2.08% (n=1) of the study participants had a single palmer in conjunction with two lobbed lungs, while 97.91% (n=47) of the study patients had none at all. These results were similar to those of Devi R et al. (2007) and Pradhan R et al. (2013), who found imperforate anus and solitary palmer as foetal abnormalities on autopsy and ultrasound.

CONCLUSION

Within its limitations, the present study concludes that autopsy and ultrasonography are largely influenced by dietary habits and economic status. Awareness among parents and early diagnosis of these malformations can help in timely MTP (Medical Termination of Pregnancy) and preventing these malformations in subsequent pregnancies.
However, the present study had a few limitations including a small sample size, short monitoring time, and geographical area biases. Hence, more longitudinal studies with a larger sample size and longer monitoring period will help reach a definitive conclusion.

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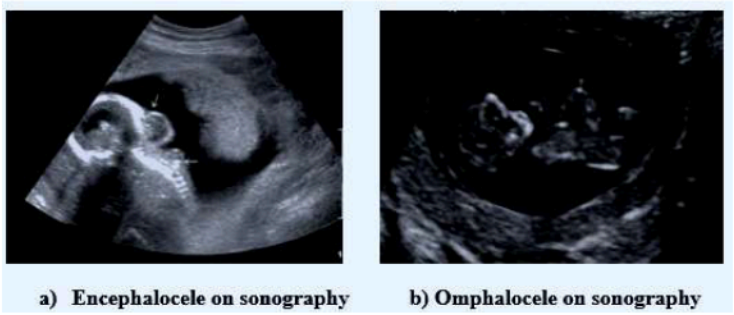
TABLES

S. No	Anomalies	Percentage (%)	Number (n)
1.	**Talipes Equino Varus**	31.25	15
2.	**Short upper and lower segments of both limbs**	6.25	3
3.	**Omphalocele**	4.16	2
4.	**Cleft palate**	4.16	2

Table 1: Congenital anomalies seen in the study subjects

S. No	Anomalies	Percentage (%)	Number (n)
1.	**Diaphragmatic hernia**		
a)	Right	2.08	1
b)	Left	4.16	2
2.	**Imperforate anus**		
a)	Present	8.33	4
b)	Absent	91.66	44
3.	**Single palmer**		
a)	Present	2.08	1
b)	Absent	97.91	47

Table 2: Fetal anomalies seen in the study subjects



a) Encephalocele on sonography **b) Omphalocele on sonography**

Figure 1: Fetal anomalies on ultrasonography