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Fetal Anomalies in Ultrasonographically Detected Polyhydramnios

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Abstract

Background: To determine the frequency and types of fetal anomalies in cases of polyhydramnios detected on ultrasonography and to compare maternal age and parity of these subjects with fetal anomalies and those without fetal anomalies.

Methods: In this cross sectional study, using colour and power Doppler ultrasound machine, one hundred diagnosed patients with ultrasonographically detected polyhydramnios were included . Sonographic examination was conducted between 12 to 40 weeks of gestation and fetal anomalies were examined.

Results: Out of 100 patients, 35 fetal anomalies were found in 30(30%) patients. The age of the patients included in the study ranged from 18 to 40 years. Majority of the anomalies (73%) were found between age group 30 – 40 years and in multigravida (83%). Central Nervous System was the commonest site with fetal anomalies (46%) followed by gastrointestinal tract (20%)

Conclusion: Prenatal detection of fetal anomalies has a decisive effect on the outcome of pregnancy and helps the obstetrician in planning the intrapartum management and for post delivery resuscitative measures, if required.

Key words: Ultrasonography, Polyhydramnios, Fetal anomalies, Doppler ultrasound machine.

Introduction

Polyhydramnios is characterized by an abnormal increase in quantity of amniotic fluid. Ultrasonographic technique allows for non invasive quantification of amniotic fluid volume. Polyhydramnios can be determined subjectively by observing increased amniotic fluid. This may be confirmed by measuring a single antero-posterior fluid pocket of greater than 8 cm or a four quadrant measurement called amniotic fluid index (AFI) of greater than 25.[1] The most common causes of polyhydramnios are fetal abnormalities, maternal diabetes and twin pregnancies . It is idiopathic in 60 % of cases.[2] It carries a high rate of antenatal and perinatal complications like fetal anomalies, diabetes mellitus, pre eclampsia, threatened abortion and low Apgar scores[3]. The more frequent fetal anomalies are cardiac, digestive, central nervous system and musculoskeletal[4]. In polyhydramnios 48% of the fetuses had severe malformations in one study.[5] Ultrasound estimation of amniotic fluid volume is a critical component of antenatal surveillance.[6]Thus targeted ultrasound in the presence of even minor abnormalities of amniotic fluid can significantly improve anomaly detection.[7,8]

Patients and Methods

This study was carried out at the Department of Radiology, Combined Military Hospital, Lahore. Colour Power Doppler machine ALOKA SSD - 5500 was utilized, having curved array transducers ranging between 3.5-5 MHz over a period of one year. One hundred singleton pregnant females with sonographically detected polyhydramnios were included in the study and were evaluated between 12 to 40 weeks of gestation having amniotic fluid index more than 25**.** Pregnant women with multiple pregnancies and diabetes mellitus were excluded. Patients were followed up where possible till delivery/termination of pregnancy.

Results

The ages of patients ranged from 18 to 40 years . A total of 35 fetal anomalies were found in 30 patients out of 100 patients, with three patients having fetuses with more than one anomaly. Central Nervous System(CNS) was affected most, followed by gastrointestinal tract (GIT) . In CNS, anencephaly and hydrocephalus were the commonest, while in GIT jejunoileal and esophageal atresia were the commonest (Table 1;Figs 1,2,3). Ultrasonography could not diagnose 3 cardiovascular anomalies. Therefore 32 anomalies in 27 patients were detectable by ultrasonography in this study. Majority of the anomalies (73%) were found in age group of 30 to 40 years (Table 2) and in multigravida(Table 3).Diagnostic accuracy of ultrasound was 91% and ultrasound sensitivity was 90% while ultrasound positive predictive value was 96% and negative predictive value 95.8%, giving a specificity of 98%.

Discussion

Polyhydramnios occurs in 1% to 3% of pregnancies.[2, 9] The frequency of fetal anomalies in our

set up is that incidence of fetal anomalies associated with polyhydramnios range from 31.3% to 38%. [7,9-13]

Table 1: Fetal anomalies

CNS (46%)	Anencephaly	05
	Hydrocephalus	03
	Microcephaly	02
	Encephalocele	02
	Spina bifida	01
	Meningocele	02
	Dandy-Walker malformation	01
GIT/Abdominal wall (20%)	Esophageal Atresia	02
	Jejunoileal Atresia	03
	Omphalocele	01
	Gastroschisis	01
CVS(09%)	Cardiac septal defects	03
Genitourinary (08%)	Multicystic Renal disease	01
	Ovarian cyst	01
	Hydrometrocolpos	01
Musculoskletal system (9%)	Club Foot	01
	Achondroplasia	01
	Micromelia	01
Head and Neck (06%)	Cleft lip	01
	Cystic hygroma	01
Respiratory system (03%)	Diaphragmatic hernia	01

Table 2: Comparison of age of patients

Age of patients	Patients without anomalies(n=70)	Patients with anomalies (n=30)
18-29 years	56 (80%)	08 (27%)
30-40 years	14 (20%)	22(73%)

Table 3: Comparison of parity of patients

Parity of patients	Patients without anomalies (n=70)	Patients with anomalies (n=30)
Primigravida	43 (61%)	05 17%)
Multigravida	27 (39%)	25(83%)

International studies reveal a varying incidence from 14.5% to 44.5%. [11,12] This variation may be because of inclusion criterias , as twin pregnancies , maternal diabetes and many other factors can lead to variable results. [11,12]

Different studies reveal high incidence of CNS anomalies, with anencephaly and hydrocephalus the commonest. [10,14-16] In GIT , occurrence of jejuno- ileal and esophageal atresia correlates with other studies , where it varies from 15 to 38%. [10, 13,17,18]

In the anomalies of head and neck region (6 %) there was one case each of cleft lip and cystic hygroma. In another study no facial defect was detected during the course of study[13].

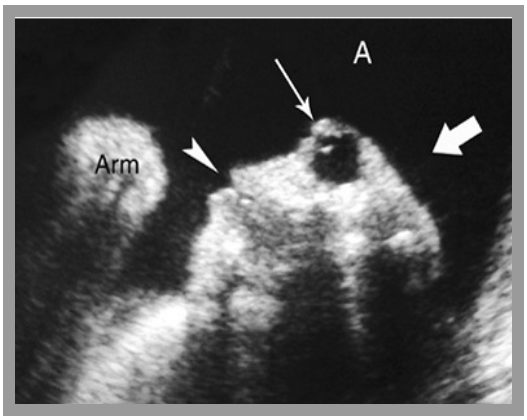

Fig. 1: Anencephaly. Saggital image through fetal head shows absence of cranial vault (thick arrow), large and prominent orbits(thin arrow), mouth and lips(arrow head) and Polyhydramnios

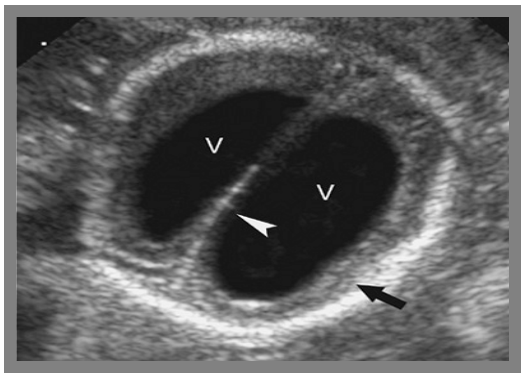

Fig.2: Hydrocephalus. An axial image of the fetal brain shows marked enlargement of the lateral ventricles (V). The falx (arrowhead) is seen as an echogenic stripe in the midline. A rind of cortex (black arrow) is present.

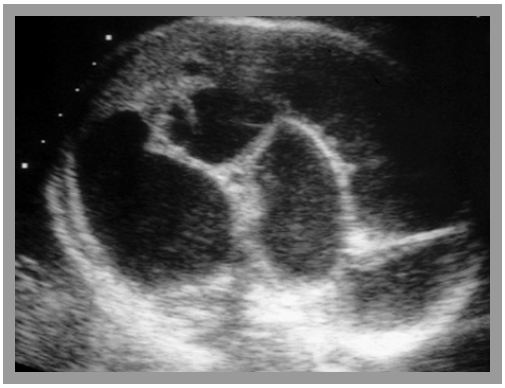

Fig. 3: Axial sonogram through fetal abdomen, Small

Bowel Obstruction. Jejuno-Ileal atresia was the cause of markedly dilated loops of small bowel .

Three cases of cardiac septal defects, missed initially, were later confirmed on neonatal echocardiography. Another study also missed cardiac septal defects and was also not able to diagnose cases of cleft palate, imperforate anus and tracheo-esophageal fistula prenatally on ultrasound examinations.[4]

The sonographic anomaly detection rate was 91% in present study. It was 80% in another study[2]. However it was 49% in a study which may be due to the fact that about a quarter of cardiac defects were missed and none of the facial defects were detected. [13]

Increased numbers of fetal anomalies (73%) were detected in age group 30 – 40 years (73%) and mostly in multiparous women (83%). These results are in agreement with studies of Munim Berkowitz et al and Ziadeh , who revealed that women who were 35 years or older were significantly more likely to have specific ante partum complications and fetal anomalies. A recent study also gave similar results regarding complications in mothers of increasing age. [13, 19 – 22]

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Conclusion

Ultrasound examination in polyhydramnios is useful in detecting fetal anomalies and helps predict fetal prognosis and to devise a proper management plan.

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