Original Article

Frequency of Fetal Anomalies in Polyhydramniotic Patients Through Antenatal Ultrasound in Radiology Department of PIMS

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ABSTRACT

Objective: To evaluate frequency of fetal anomalies in polyhydramniotic patients through antenatal ultrasound in Radiology Department of Pakistan Institute of Medical Sciences (PIMS).

Study Design: Cross Sectional Observational study

Place and Duration of Study: This study was conducted at the Mother and Child Health (MCH) Centre, Pakistan Institute of Medical Sciences (PIMS), Islamabad from January to December, 2003.

Patients and Methods: All women coming for antenatal ultrasound scan during the period January – December 2003 were included in this study. The ultrasound scans were done by the Radiology resident and confirmed by a single consultant radiologist. The data obtained was entered on a proforma.

Result: A total of 42(0.79%, n=5260) women were found to have polyhydramnios, out of which 11(26%) had associated fetal anomalies. Among all (11) anomalies detected, there were 5 cases (45.45 %) of anencephaly, 3 cases (27.27 %) of hydrocephalus, one of which had associated meningocele, and 01(9%) case each of omphalocele, spinal anomaly and skeletal dysplasia. 3 (27.27 %) women had concurrent disease.

Conclusion: Expart antenatal ultrasound is recommended to assess the presence of polyhydramnios and any associated fetal anomalies. Amniocentesis, glucose tolerance test or HbA1c levels are advisable when the suspicion of associated fetal anomalies is high.

Key Words: Polyhydramnios, Antenatal ultrasound, Amniotic fluid.

INTRODUCTION

Polyhydramnios is defined as excessive amount of amniotic fluid surrounding the fetus.[1] It is both a symptom and a threat, occasionally associated with fetal or maternal abnormalities[2]. Its significance is also due to the fact that even if it is idiopathic it can lead to premature rupture of the membranes, premature labour and premature delivery.[3,4,5] Hence, this study was conducted to evaluate all women coming for antenatal ultrasound, and to identify the occurrence of concurrent abnormalities.

Assessment of liquor volume is usually subjective. However, the following parameters for its assessment have been developed. Firstly, an amniotic fluid index (AFI) greater than 24, AFI (measured in cm) being the sum of the single deepest pocket of amniotic fluid in each of the 4 quadrants.[6] Secondly, largest fluid pocket greater than 8 cm is indicative of polyhydramnios. Thirdly, if the fetus does not fill the AP diameter of the uterus, it is considered to be polyhydramnios.[3,7]

The incidence of the major groups of causes is idiopathic causes 60%, maternal causes 20% and fetal causes 20%.[7,8,9]

Maternal causes include diabetes mellitus, hypertension, obesity, rhesus incompatibility, anemia, congestive cardiac failure and syphilis.

Fetal causes encompass lesions, malformations and abnormalities of the CNS, gastrointestinal tract, thorax, heart, musculoskeletal system and urinary tract. Other conditions causing polyhydramnios include twin-twin transfusion, fetal hydrops, infections, metabolic and chromosomal disorders, various neck masses and other miscellaneous conditions.

CNS lesions include neural tube defects like anencephaly, hydrocephalus, holoprosencephaly, encephalocele, hydranencephaly, meningocele, Dandy Walker malformation, agenesis of the corpus callosum and lissencephaly.

Obstructive malformations of the gastrointestinal tract comprise tracheoesophageal fistula, esophageal, duodenal and jejunal atresias, congenital pancreatic cysts, annular pancreas, gastroschisis, meconium peritonitis, bowel perforation, and hepatic tumours[10].

Thoracic abnormalities include cystic adenomatoid malformation, primary pulmonary hypoplasia, diaphragmatic hernia, congenital chylothorax, mediastinal and lung masses like teratoma, tracheal atresia and pulmonary sequestration.

Cardiac causes of polyhydramnios are arrhythmias, myocardial disorders, ventricular septal defects, coarctation of aorta, interruption of fetal aorta, truncus arteriosus, ectopia cordis and high output states like teratoma

Musculoskeletal abnormalities include achondroplasia, osteogenesis imperfecta, hypophosphatasia, platyspondyly, and camptomelic and thanatophoric dwarfism

Urinary tract anomalies e.g. vesicoureteric reflux, ureteropelvic junction obstruction, congenital mesoblastic nephroma

Infections like toxoplasmosis and cytomegalovirus; metabolic disorders such as Gaucher's disease and mucopolysaccharidosis; and chromosomal anomalies like trisomies 18, 21 and 13-15 and Turner's syndrome can also cause polyhydramnios.

Other causes include neck masses that cause extrinsic compression of the esophagus and impairment of swallowing like cystic hygroma and congenital goiter and miscellaneous conditions such as sacrococcygeal teratoma and ovarian cyst.[11]

MATERIALS AND METHODS

Subjects: All pregnant women coming for antenatal ultrasound were included in this study irrespective of their age or the presence or absence of systemic diseases or risk factors.

Apparatus: Schimadzu ultrasound machine was used for doing the ultrasound scans and all positive cases were further evaluated and reported by a single consultant radiologist.

Method: This was a cross sectional observational study conducted at the Mother and Child Health (MCH) Centre, Pakistan Institute of Medical Sciences (PIMS), covering the period January to December, 2003.

All women presenting for antenatal ultrasound were included in the study. All records were scrupulously maintained on a proforma, and the presence of polyhydramnios and any associated fetal or maternal abnormalities was recorded meticulously.

RESULT

A total of 5260 women were included in the study. of these, 42 were found to have polyhydramnios (Figs Nos. 1,2,3), out of which 11 women had associated fetal anomalies (Table No.1).

Out of a total of 42 women showing polyhydramnios, 11 were found to have associated fetal anomalies. Of these 11 patients, 5 had anencephaly, 2 hydrocephalus alone, and one each of hydrocephalus with meningocele, omphalocele, spinal anomaly and skeletal dysplasia. Three women had associated maternal problems, two being diabetic and one hypertensive.

DISCUSSION

The purpose of this study was to analyze the prevalence of polyhydramnios, which is a problem seen quite regularly in a tertiary care hospital like PIMS. In addition, the association of polyhydramnios with fetal anomalies was also assessed.

Table I: Number of patients with polyhydramnios and fetal anomalies

Month	Total antenatal ultrasound	No. of polyhy-dramnios	No. of fetal anomalies
January	404	6	1
February	622	4	Nil
March	500	3	1
April	266	2	1
May	513	9	4
June	597	4	Nil
July	620	2	Nil
August	308	2	Nil
September	372	4	1
October	353	4	1
November	352	2	2
December	353	Nil	Nil
Total	5260	42	11

Figure No.1:Anencephalic fetus with polyhydramnios

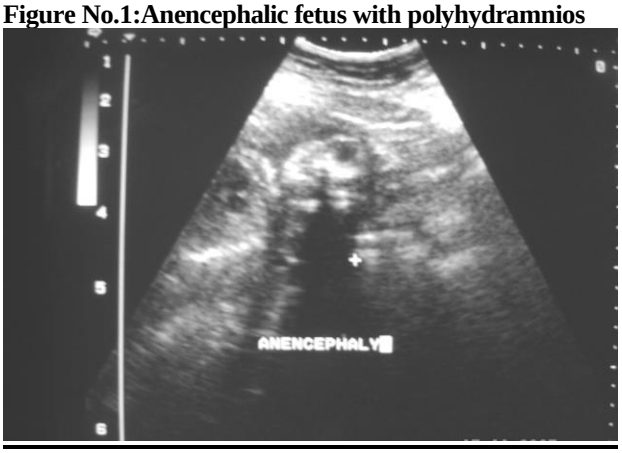


Figure No. 2: Polyhydramnios with a large pocket of 11.2 cm

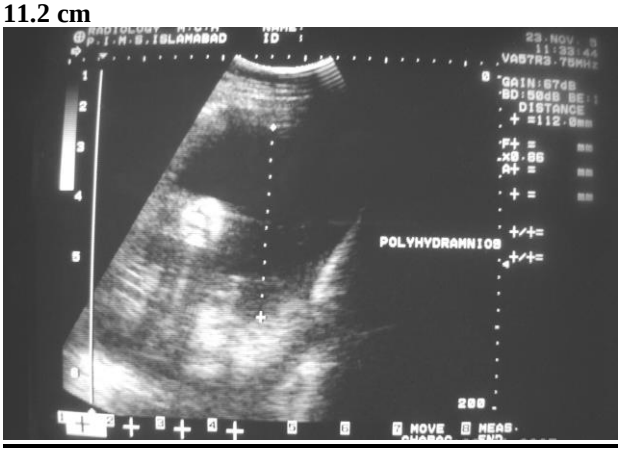
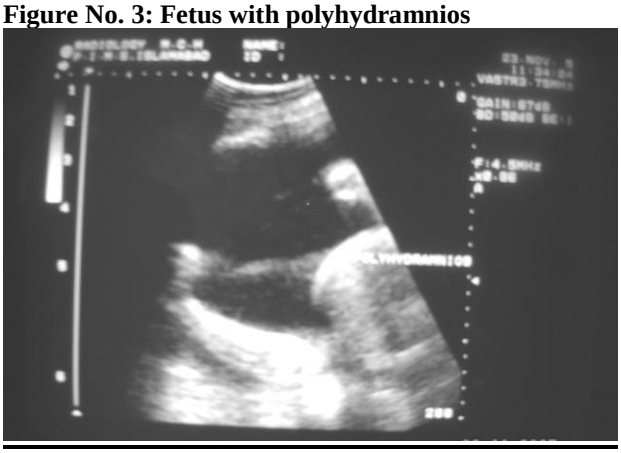


Figure No. 3: Fetus with polyhydramnios



The incidence of polyhydramnios in our study was 0.79%, which is less than the internationally published value of 1.1-3.5%,[7] or 2% from another source[12,13].

In our study, the anomalies detected were anencephaly, hydrocephalus alone and with meningocele, omphalocele, spinal anomaly and skeletal dysplasia. The commonest association detected was with anencephaly of which five cases were seen,[17] 11.9% of the total. This corresponds to the published value of 9-16% for neural tube defects.[7] Anencephaly is the single most common fetal anomaly causing hydrocephalus.[11] Next in order of frequency was hydrocephalus with meningocele, 7.1 % of the total.

Omphalocele comprised 2.38% of the total anomalies detected which compares with 2.5% reported in the Indian literature[18]. Spinal anomalies also comprised 2.38% which is much less than the 7.5% reported[18]. Skeletal dysplasia again comprised 2.38% of the total cases of polyhydramnios.

Maternal causes were seen in 7.14% of the patients, 4.76% having diabetes, and 2.38% being hypertensive. In published data, maternal causes account for 20%, of which 5% are diabetic.[7] The percentage of diabetics with polyhydramnios in our study corresponds to the published data[7]. Other studies report an incidence of 10.8%[14] and 14%[15].

In 66.7% of our cases of polyhydramnios, no maternal or fetal cause could be ascertained. This is slightly more than the 60% reported in the literature.[7,8,16] The reported incidence of fetal anomaly was 18.9 % in international literature.[2,6]

In view of our population characteristics that generally diseases and anomalies of all types are more common in our set up, it is surprising that the incidence of polyhydramnios in our setup was found to be lower than in Western literature. This raises certain questions:-

(i) Are we following the same criteria when diagnosing polyhydramnios?

(ii) Should we, being an Asian set up, be following the same criteria or should we be using a different set of criteria for evaluating polyhydramnios?

As Pakistani/Asian babies tend to be smaller, the normal upper limit of AFI may generally be smaller in such pregnancies. Hence many pregnancies may be found to have polyhydramnios if a lower set of values is taken as normal.

(iii) Incidentally, the association of maternal problems with polyhydramnios was found to be lower in our study.[11] Are we evaluating for diabetes and hypertension according to set criteria or is our pregnant population younger than in other countries and such problems have not yet developed in them? For evaluation of diabetes mellitus, glucose tolerance test is advisable[19,20], which recommendation is not routinely followed and only random glucose level assessment is performed. Alternatively, HbA1c level on a single fasting sample is advisable and less cumbersome than glucose tolerance test.[21]

CONCLUSION

Antenatal ultrasound by an expert in the field is recommended to assess the presence of polyhydramnios and any associated fetal anomalies. Amniocentesis, glucose tolerance test or HbA1c levels are to be performed as an adjunct in diagnosis when the index of suspicion of associated fetal anomalies is high.

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