

Frequency of Congenital Anomalies in Polyhydramnios

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ABSTRACT

Abstract: Polyhydramnios is a relatively uncommon but distressing complication associated with pregnancy.

Objective: To find frequency of congenital anomalies with increasing severity of polyhydramnios.

Study Design: Prospective Study.

Place and Duration of Study: This study was conducted in Lady Willingdon Hospital, Lahore from July 2009 to June 2011.

Materials and Methods: Total 170 diagnosed cases of polyhydramnios from 20-41 weeks of gestation were included in the study.

Results: Polyhydramnios was diagnosed in 170 pregnancies. Mild polyhydramnios (AFI 24.0-29.9 cm) was found in 112 (65.88%) pregnancies, moderate (AFI 30.0-34.9 cm) in 38 (22.35%) pregnancies and severe (AFI 35.0 cm or more) in 20 (11.76%) pregnancies. Antenatal detection of anomalies was in 71 (41.76%) fetuses. The prevalence of anomalies was higher in pregnancies with more amniotic fluid. A total of 83 anomalies were detected in 71 fetuses. Pregnancies complicated with severe polyhydramnios had maximum number of fetuses with multiple anomalies. 37 pregnant women out of 170 (21.76%) with polyhydramnios had maternal diabetes. Of these 37 pregnancies 11 (29.72%) had pregestational diabetes, 13 (35.13%) had gestational insulin treated diabetes, 13 (35.13%) had gestational diet controlled diabetes. Anomalous fetuses were present in 5 (13.51%) of diabetic pregnancies with polyhydramnios. There were 7 (4.11%) fetal deaths in pregnancies complicated with polyhydramnios.

Conclusions: This study proves that pregnancies with severe polyhydramnios have a greater frequency of fetal anomalies. Diagnosis of second trimester polyhydramnios should initiate a search for possible associated fetal anomalies and causative factors.

Key words: Polyhydramnios, congenital anomalies, amniotic fluid.

INTRODUCTION

Fetus within the uterus is surrounded by alkaline fluid called amniotic fluid. This fluid is important for its proper growth and development. Normal amniotic fluid level varies in relation to period of gestation. Polyhydramnios refers to an excess amount of amniotic fluid¹.

Polyhydramnios occurs in about 1% of pregnancies¹. It is defined as “deepest vertical pocket (DP) of more or equal than 8cm”² or “amniotic fluid index (AFI) of more or equal than 24cm”³. AFI is preferred to DP because DP does not allow for an asymmetrical fetus position within the uterus⁴.

Polyhydramnios is often indicative of fetal, placental or maternal problems. In polyhydramnios there is an increased risk of perinatal morbidity and mortality. The recent observations indicate a more dominant role of anomalous fetus development in production of polyhydramnios⁵.

Congenital anomalies are defined as “gross structural defect present at birth”⁶. Various factors are associated with congenital anomalies. Polyhydramnios is one of them².

Aim of Study is to find frequency and ultrasound detection of different fetal anomalies in pregnancies complicated with polyhydramnios to improve counseling for women with polyhydramnios.

MATERIALS AND METHODS

This is a prospective study of singleton pregnancies conducted in Lady Willingdon Hospital, Lahore from July 2009 to June 2011. A total number of 170 pregnant women from 20 to 41 weeks of gestation with ultrasound diagnosis of polyhydramnios were included in the study. 9 women with polyhydramnios who presented in labour ward with established labour were excluded from the study. Each case was evaluated for demographic profile, severity of symptoms and maternal medical disorder. Abdominal examination was performed. Obstetrical ultrasound was done and record was made for fetal biometry, placental localization, liquor volume estimation. Degree of polyhydramnios was measured by Amniotic Fluid Index (AFI). After diagnosis of polyhydramnios congenital fetal anomalies were recorded and classified according to organ system involved by targeted sonography.

AFI was determined by directly measuring the vertical pocket (free of any fetal part) in four quadrants of maternal abdomen. The line of demarcation being linea alba longitudinally and umbilicus transversely. The four quadrant's largest pockets were summed and AFI was measured. Depending upon AFI polyhydramnios was categorized as Mild (AFI 24.0-29.9 cm), Moderate (AFI 30.0-34.9 cm) and Severe (AFI 35 cm or more). Association of fetal anomalies with increasing severity of polyhydramnios was defined according to organ system(s) involved. Record of fetal death was also

made. Anomaly was considered to be present if detected in antenatal period.

Pregnancies complicated by diabetes were also analyzed separately. Gestational diabetes was diagnosed based on standard 100 gm oral glucose tolerance test. Frequency tables and percentages were calculated. Data was analyzed on SPSS.

RESULTS

Table No.1 : Degree of polyhydramnios

Degree of Polyhydramnios	Number of Patients	Percentage
Mild Polyhydramnios (AFI 24.0-29.9cm)	112	65.88 %
Moderate polyhydramnios (AFI 30.0-34.9cm)	38	22.35 %
Severe polyhydramnios (35.0 cm or more)	20	11.76 %

Table No.2: Number of anomalous fetuses stratified by severity of polyhydramnios

Fetuses	Mild polyhydramnios n=112	Moderate polyhydramnios n=38	Severe polyhydramnios n=20	Total No n=170
Anomalous fetuses	28 (25%)	26 (68.4%)	17 (85%)	71 (41.76%)
Normal fetuses	84 (75%)	12 (31.57%)	3 (15%)	99 (58.2%)

P < 0.05

Table No.3: Different organ systems involved

Organ system involved	Mild polyhydramnios n=31	Moderate polyhydramnios n=16	Severe polyhydramnios n=36	Total No. of anomalies n=83
Central nervous system	21	4	10	35
Gastrointestinal system	2	4	8	14
Thoracic	1	1	9	11
skeletal	3	3	3	9
Ventral wall	—	3	3	6
Cardiac	2	1	3	6
Craniofacial	2	—	—	2

Table No.4: Association of diabetes with anomalies in polyhydramnios

Type of diabetes	No. of Patients n=37	No. of Anomalies n=5
Pregestational diabetes	11 (29.72%)	3 (8.10%)
Gestational insulin treated diabetes	13 (35.13%)	1 (2.70%)
Gestational diet controlled diabetes	13 (35.13%)	1 (2.70%)

Polyhydramnios was diagnosed in 170 pregnancies. Polyhydramnios was categorized as mild (AFI 24.0-29.9 cm) in 112 (65.88%) pregnancies, moderate (AFI 30.0-34.9 cm) in 38 (22.35%) pregnancies and severe (AFI 35.0 cm or more) in 20 (11.76%) pregnancies as shown in table 1.

Table II shows number of anomalous fetuses (as detected by ultrasound) stratified by severity of polyhydramnios. Antenatal detection of anomalies was in 71 (41.76%) fetuses. The prevalence of anomalies was higher in pregnancies with more amniotic fluid (P < 0.05). Thus as hydramnios increased, the frequency of anomalies increased.

Table 3 presents list of anomalies, detected by antenatal ultrasound. A total of 83 anomalies were detected in 71 fetuses. This was due to presence of multiple anomalies in fetuses. Maximum anomalies were detected in central nervous system. Pregnancies complicated with severe polyhydramnios had maximum number of fetuses with multiple anomalies.

Table IV shows association of maternal diabetes with polyhydramnios. Total of 37 pregnant women out of 170 (21.76%) with polyhydramnios had maternal diabetes. Of these 37 pregnancies 11 (29.72%) had pregestational diabetes, 13 (35.13%) had gestational insulin treated diabetes, 13 (35.13%) had gestational diet controlled diabetes. Anomalous fetuses were present in 5 (13.51%) of diabetic pregnancies with polyhydramnios.

There were 7 (4.11%) fetal deaths in pregnancies complicated with polyhydramnios.

DISCUSSION

Polyhydramnios is a relatively uncommon complication associated with pregnancy. The clinical problems associated with polyhydramnios, apart from fetal anomalies are, maternal discomfort, preterm labour, abruptio-placenta and many others. Polyhydramnios is

suspected clinically and confirmed by measuring Amniotic Fluid Index with ultrasound.

The results of this study demonstrate that frequency of anomalies in fetuses increases proportionally to the degree of polyhydramnios complicating pregnancy, which is fairly comparable with other studies ^{7,8}. In present study antenatal detection of anomaly is 41.76% while in study of Paur HU, Viereck V the antenatal detection of anomaly was 48% ². The same results are shown by Damato et al although in his study amniotic fluid volume was measured according to DP (Deepest Pool) ⁹ Esplin et al recommended that diagnosis of second trimester polyhydramnios should initiate a search for possible associated anomalies ¹⁰. Present study shows that 15.49% (11 of 71) anomalous fetuses had multiple anomalies thus a total of 83 anomalies were found.

As far as type of fetal anomalies are concerned, in present study neural tube defects are the largest group, which were 35 (42.16%) out of total 83 anomalies found. These defects are easily detectable by ultrasound in first and second trimester. In study of Stoll et al more frequent malformations associated with polyhydramnios were CNS (central nervous system), GIT (gastrointestinal), cardiac, musculoskeletal and urinary systems ¹¹. Whereas in review of polyhydramnios by Cardwell, Jacoby and Charles CNS defects comprised 50% of congenital anomalies ^{12,13}. In present study Anencephaly was most common anomaly detected.

Similarly serious structural abnormalities like septal defects and anterior abdominal wall defects can be easily diagnosed by mid trimester ultrasound ¹⁴. If early diagnosis is made maternal psychological and physical trauma can be reduced by offering early termination of pregnancy.

Apart from fetal malformations, polyhydramnios may also indicate maternal medical disorder. In this study maternal diabetes mellitus was found to be associated in 37 (21.76%) of pregnancies. Uncontrolled diabetes in first trimester leads to congenital anomaly in fetus. Therefore ultrasound examination at 18-20 weeks of gestation should be performed to exclude major structural defects at this stage. ^{15,16}. Lazebnic and Many found that the anomaly rate was not significantly different between diabetic pregnancies with hydramnios and non diabetic pregnancies with hydramnios ¹⁷. However in present study fetal anomaly detection rate in diabetic mothers with polyhydramnios was 13.51% compared to non diabetic pregnancies.

Idiopathic polyhydramnios in 3rd trimester can cause high maternal morbidity and fetal morbidity and mortality due to excessive abdominal distention, sudden premature rupture of membranes, placental abruption, cord prolapse, fetal malpresentation, postpartum hemorrhage and operative delivery. Pregnancies with severe polyhydramnios are usually delivered at an

earlier gestational age and have correspondingly lower birth weights.

Although fetal karyotype may be offered in the setting of polyhydramnios, women should be informed that if no anomaly is detected sonographically, the aneuploidy risk is likely 1% or less. In cases where fetal growth restriction coexists with polyhydramnios and malformation, amniocentesis has been recommended ^{18,19}.

CONCLUSION

Polyhydramnios is an uncommon but distressing condition for the patient. Differentiating severe from mild polyhydramnios has prognostic implications. This study proves that pregnancies with severe polyhydramnios have a greater frequency of fetal anomalies. Knowledge of fetal anomalies and potential risks is the basis for counseling parents about the pregnancy outcome. Therefore diagnosis of second trimester polyhydramnios should initiate a search for possible associated fetal anomalies and causative factors.

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