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RESEARCH ARTICLE

Polyhydramnios: ultrasonographic detection, associated risk factors and perinatal outcome

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ABSTRACT

Objectives: Detection of polyhydramnios by ultrasonography and studying its associated risk factors and following up for its perinatal outcome were the objectives of this study. **Methods:** It was an observational study in which 70 antenatal cases of polyhydramnios from 20-42 weeks of gestation were taken into consideration, irrespective of age and parity. **Results:** Out of total 70 patients in the study, 42.8% were diagnosed at gestational age of 33-37 weeks. Forty (57.14%) cases were having mild polyhydramnios. Thirty eight (54.28%) cases had no associated risk factors. In rest of cases congenital malformation 24.27% and diabetes 7.14% were associated as the risk factors. Forty (57.1%) pregnancies had no complication but 10% developed preterm labor. Thirty six (51.42%) cases had normal vaginal delivery and 31.42% had caesarean section. Fifty three (75.71%) of newborns were alive but 17.14% had neonatal death. **Conclusion:** Most cases were diagnosed after 28weeks and most had idiopathic and mild polyhydramnios. Diabetes and congenital malformation were the most frequent associated risk factors. Preterm labor represented the most frequent complication. Caesarean section as a mode of delivery was higher.

Keywords: Amniotic fluid, AFI, polyhydramnios, ultrasonography.

Polyhydramnios is a condition in which there is excess of liquor amnii surrounding the foetus. Arbitrarily more than 2L of amniotic fluid is considered excessive and termed as polyhydramnios. It is identified in approximately 1% of pregnancies [1]. Polyhydramnios can be idiopathic or it can be associated with several aetiological factors [2-4]. The factors can be foetal, placental or maternal. The majority of cases are mild or moderate in severity and are idiopathic. When it is severe an underlying foetal cause is likely. The clinical diagnosis of polyhydramnios should always be confirmed by ultrasonography. Methods used are the measurement of the single deepest pocket and the measurement of amniotic fluid index. Polyhydramnios is associated with a number of maternal (Respiratory distress, Pre-eclampsia, Abruption placentae, Placenta accrete, Body weight gain ≥ 20 kg during pregnancy, Post partum haemorrhage) and foetal (Preterm delivery, Premature rupture of membranes, Umbilical cord prolapse, Low birth weight, Large for gestational age baby, Intra uterine foetal death, Meconium stained amniotic

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fluid)complications [5]. Early detection of polyhydramnios and its appropriate antenatal management can help the clinician prevent the foreseen complications related to perinatal outcome [6-9]. So, in this observational study design, we planned to identify the risk factors associated with polyhydramnios and followed up the cases to relate it to the perinatal outcome.

Methods

In this study, 70 antenatal cases after 20 weeks of gestation were taken into consideration after a detailed history and examination.

Inclusion criteria:

- All cases of polyhydramnios, irrespective of age and parity, either singleton/multiple pregnancies having AFI ≥ 25 cms or maximum vertical pocket ≥ 8 cms.
- Gestational age 20-42 weeks.

Exclusion criteria:

- Pregnancies associated with overdistended abdomen other than polyhydramnios.
- First trimester pregnancies

The cases suspected to have polyhydramnios clinically were subjected to ultrasonographic assessment of their amniotic fluid index. Diagnosis of polyhydramnios was confirmed if patient had AFI ≥ 25 cms or maximum vertical pocket ≥ 8 cms [10]. The subjects who had polyhydramnios were carefully followed for associated risk factors and perinatal outcome associated with the condition was observed.

Results

When studied according to gestational age of diagnosis, it was found that, 20 (28.57%) of them were diagnosed at gestational age < 28 weeks, 15 (21.42%) were diagnosed at gestational age between 28-32 weeks, 30(42.85%) between 33-37 weeks and 5(7.14%) were diagnosed between 38-42 weeks (table 1).

Table 1: Gestational age in weeks at diagnosis

Gestational age (wks)	No. of Patients (%)
Less than 28	20(28.57%)
28-32	15(21.42%)
33-37	30(42.85%)
38-42	5(7.14%)

Table 2: Amniotic fluid volume

Categories	AFI (Amniotic fluid index)	Maximum vertical pocket depth	Number (%)
Mild	25-30 cms	8-11 cms	40(57.14%)
Moderate	30.1-35 cms	12-15 cms	25(35.71%)
Severe	≥ 35.1 cms	≥16 cms	5(7.14%)

Using the ultrasound to confirm polyhydramnios, 40 (57.14%) of the cases had a deepest pool of the amniotic fluid volume in the range of 8-11 cms and AFI in range of 25-30cms, 25(35.71%) had deepest pool in the range of 12-15 cm and AFI 30.1-35 cms, and in 5(7.14%) the deepest pool was more than ≥ 16 cm with AFI ≥ 35.1 cms (table 2).

Table 3: Screening for associated risk factors in the current pregnancy

Risk factors	Number of patients (%)
No Risk Factors	38(54.28%)
Maternal factors	
Diabetes mellitus	5(7.14%)
Intrauterine infections	1(1.42%)
Multiple Pregnancies	5(7.14%)
Foetal factors	
Rhesus Isoimmunisation Complicated with hydrops fetalis	4(5.71%)
Neural tube defects	12(17.14%)
Gastrointestinal defects	3(4.28%)
Cleft lip & palate	2(2.85%)

It was found that 38(54.28 %) of the cases had no related risk factors, while 32 (45.72%) of them had risk factors. These risk factors were maternal - diabetes

mellitus in 5(7.14%), 5(7.14%) cases had multiple pregnancies and 1(1.42%) had intrauterine infections and foetal - rhesus isoimmunisation complicated with hydrops fetalis in 4(5.71%), neural tube defects in 12 (17.14%), gastrointestinal defects in 3(4.28%) and 2(2.85%) had cleft lip and palate (table 3).

Regarding the complications arising during the current pregnancy, 7 (10%) developed preterm labour, 3(4.28%) suffered from acute abdominal pain, 5(7.14%) had premature rupture of membranes and

Table 4: Complications arising during the current pregnancies

Complications	No. of Patients (%)
Developed preterm labour	7(10%)
Acute abdominal pain	3(4.28%)
Premature rupture of membranes	5(7.14%)
Intrauterine fetal deaths	3(4.28%)
Pre-eclampsia	4(5.71%)
Placental abruption	3(4.28%)
Post partum haemorrhage	3(4.28%)
Body weight gain > 20 kgs.	2(2.85%)
No complication	40(57.1%)

3(4.28%) ended with intrauterine fetal deaths, 4(5.71%) had pre-eclampsia, 3(4.28%) had placental abruption, 3(4.28%) had post partum haemorrhage, 2(2.85%) had body weight gain > 20 Kgs, and the others 40 (57.1%) had no complication.(table 4)

Regarding the gestational age at delivery, 5(7.14%) delivered at gestational age less than 28 weeks, 12(17.14%) between 28-32 weeks, 15 (21.42%) between 33-37 weeks and 38(54.28%) delivered at gestational age between 38-42 weeks. In relation to the mode of delivery, 36(51.42%) delivered spontaneous vaginal delivery, 12(17.14%) had induced labor, 16(22.85%) were delivered by emergency caesarean section and 6(8.57%) by elective Caesarean section for various obstetric indications.

When compared for perinatal outcome, 53(75.7%) of the newborns were alive, 2(2.85%) were fresh stillbirths, 3(4.28%) were intrauterine deaths and 12(17.14%) ended with early neonatal deaths. Regarding the birth weight, out of 70 cases, 15 (21.43%) newborns weighed less than 2.5 Kgs, 50 (71.42%) ranged between 2.5-4 Kgs and 5 (7.14%) weighed more than 4 Kgs. Fifty six (80%) of the newborns had no apparent congenital malformations whereas in 14(20%) of them, apparent congenital malformation were observed. The distribution of the apparent congenital malformation were as follows: anencephaly in 10(71.42%) of cases, 2(14.28%) had cleft lip and palate, and 2(14.28%) had encephalocele .

Discussion

In relation to gestational age at diagnosis in weeks most of the patients (71.4%) were diagnosed after 28 weeks and only (28.5%) were diagnosed before that, this indicates that polyhydramnios accumulates gradually and only noticed after 30 weeks while in few cases polyhydramnios accumulates quickly and diagnosed earlier. Forty (57.14%) of the cases had mild polyhydramnios, 35.71% had moderate and in 7.14% it was severe polyhydramnios. These results are similar to the study done by Jacoby and Chales [11] where 59.3% were mild, 35.3% moderate and 6.4% severe out of 156 cases. Hills et. al. [1] found mild polyhydramnios in 79% cases, moderate in 16%, and severe in 5% cases, out of total 85 cases. This can be explained by the fact that, most of the cases of polyhydramnios are mild.

It is observed that 54.28 % of the cases had no related risk factors in the current pregnancy, while 45.72% of them had risk factors; 7.14% of the total cases were diabetic, (24.2%) had structural congenital malformations, these results are similar to that from the study done in Switzerland in 1993 by Golan A et al [5].

In this study, 57.1% of the patients had no complications arising during the current pregnancy and this can be explained by that most of the cases were idiopathic and mild. Preterm labour represented the most frequent complication (10%), 4.28% suffered from acute abdominal pain, 7.14% had premature rupture of membranes and 4.28% ended with intrauterine fetal deaths, 5.71% had pre-eclampsia, 4.28% had placental abruption, 4.28% had post partum

haemorrhage, 2.85% had body weight gain > 20 Kgs. Jaccoby and Charles [11], in their study detected 156 cases of polyhydramnios, various maternal and fetal complications were diabetes 26.3%, preterm labor 25.6%, pre-eclapmsia 14%, premature rupture of membrane 19.3%, breech presentation 11%, anemia 9.6%, postpartum haemorrhage 6.4%, Rh isoimmunisation 3.8%, cord prolapse 2.5% and antepartum haemorrhage 1.2%. Hills et al. [1] detected 102 cases of mild-severe polyhydramnios, there were 21.6% cases of preterm labor, 14.7% of twin pregnancy and 1% cases of Rh-isoimmunisation. It is clear that preterm labor is a major complication of polyhydramnios and is an important cause of increased neonatal morbidity and mortality. Results of present study are in close association with above studies.

In present study, 7.14% were delivered at gestational age of less than 28 weeks, 17.14% between 28-32 weeks, 21.42% between 33-37 weeks and 54.28% delivered at gestational age between 38-42 weeks. This is similar to the study done by Taskin et al. [12], where the gestational age at the time of delivery ranged from 24 to 41 weeks, and the mean gestational age in the groups were 38.4±1.9. This can be explained as some cases had preterm delivery, which was the most frequent complication, and some patients had induction of labor prematurely because of the presence of congenital malformations.

In relation to the mode of delivery 31.4% of patients delivered by caesarean section and this high rate of caesarean section could be explained by the fetal macrosomia, and complications such as footling breech, cord prolapse, abruptio placentae, as reported in study from United States done by Sohaey R et al. in 1997 [13].

In this study, 75.7% of the newborns were alive, 2.85% were fresh stillbirths, 4.28% were intrauterine deaths and 17.14% ended with early neonatal deaths. This can be explained by the fact that most cases of polyhydramnios were mild and idiopathic. In our study 7.14% were stillbirths and intrauterine deaths. The early neonatal deaths were found to be 17.14% and this confirmed the high association between polyhydramnios and perinatal mortality. The high perinatal mortality can be explained by increased incidence of congenital malformations and prematurity in the newborns.

In this study, 7.14% of newborns had birth weight more than 4 Kgs, this can be explained by the association between macrosomia and polyhydramnios and gestational diabetes mellitus. Most of the newborns (80%) had no apparent congenital malformation and this is because most of the patients had no risk factors in their current pregnancy. Twenty percent newborns with congenital malformations, neural tube defect accounted for 85.7% cases with anencephaly being the commonest. This incidence was comparable to similar results in the studies conducted by Romero Gutierrez (24%), Ben-Chetrit A (21.8%), Lyndon M Hill (20%), R William Quinlan (18%) and Desmedt (17.8%) [14-18]. However the incidence of congenital anomalies were lower in the studies conducted by Shabnam (2.8%), Kaukab Tashfeen (8.1%), Joseph R Biggo (8.4%), Dashe (11%) and Lazebnik (14.5%) [19-23].

Conclusion

In this study, most of the cases had been diagnosed after the gestational age of 28 weeks and most of them had idiopathic and mild polyhydramnios. Diabetes and congenital malformation were the frequent associated risk factors of polyhydramnios. Preterm labour represented the dominant complication of polyhydramnios. Caesarean section as a mode of delivery was found to be higher in cases of polyhydramnios than the international rate. There is a high incidence of fetal macrosomia in cases of polyhydramnios even in non diabetic mothers. Neural tube defect and intestinal obstruction are the commonest congenital malformation associated with polyhydramnios. Polyhydramnios is associated with high perinatal mortality and morbidity rate.

Conflict of interest: None. **Disclaimer:** Nil.

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