

# Ultrasonographic Study of Fetal Anomalies in Hydromnios Complicating Pregnancy

P. Ananthlakshmi<sup>1</sup>, P. Sarweswar Reddy<sup>2</sup>

## ABSTRACT

**Introduction:** Polyhydromnios has been recognized as a clinical land mark of congenital malformations and impending severe perinatal compromise. So the present study aims to ascertain the incidence of various etiological factors, maternal complications and associated foetal anomalies in cases of polyhydromnios.

**Material and Methods:** The present prospective study conducted for a period of 1 year on fifty pregnant women with polyhydromnios which was clinically suspected. All cases of overdistended uterus were taken for study. The study was conducted over a period of 1 year.

**Results:** The present study comprised of fifty cases of polyhydromnios confirmed by ultrasound and looked for congenital malformations. Most of these patients belonged to low socioeconomic status about 70%. Most of these cases were in age group of 20-30 years. Coming to parity most of these cases were multiparous women, among them grandmulti were about 8%. Teenage pregnancies were about 22%. Among the 50 cases studies most of these were mild variety, severe variety was 8% of cases. Toxaemia of pregnancy was observed in 22%.

Rh isoimmunisation was found in 2% of cases. Anaemia is the most common associated medical condition seen in all grades of hydromnios, (which was seen in 64% of cases). Multiple pregnancy was observed in 8% of cases. Twin pregnancy was 6%, out of which Monozygotic twins were 4%, Dizygotic twins were 2%, Triplets were 2%. In this study the overall incidence of congenital malformation was 20%. Most commonly seen congenital anomalies were open neural tube defects.

**Conclusion:** This study ascertained the incidence of various etiological factors, maternal complications and associated foetal anomalies of polyhydromnios. The technical innovations in the medical field should be utilised properly.

**Keywords:** Ultrasonography, Polyhydromnios, congenital malformation.

## INTRODUCTION

Prenatal diagnosis of volume of amniotic fluid when done by physical examination alone may be difficult and is frequently inaccurate. Amniotic fluid and its distribution throughout the uterine cavity is readily identified by ultrasound examination. This objective method of evaluation may be used to evaluate amniotic fluid volume and its adequacy. Semi quantitative estimation of amniotic fluid volume by an ultrasound method is a component of fetal bio-physical profile scrutiny.<sup>1</sup>

Hydromnios is associated with maternal diseases and fetal conditions which may require active intervention, planning and management. Apart from inherent problems of hydromnios such as unstable lie, malpresentation, premature rupture of membranes, cord prolapse, uterine inertia, accidental haemorrhage, post partum haemorrhage and retained placenta, the overall incidence of congenital anomalies in hydromnios is also high, ranging from 15-20% reported by several authors

throughout the world.<sup>3</sup> Perinatal death rate is 80-90% in those cases where the hydromnios is associated with congenital anomalies of fetus indicating poor prognosis. Ultrasound is playing an important role in the antenatal diagnosis and management of the congenital anomalies in utero.

Early detection of defects of fetus by ultrasound allows decision to be made regarding continuation of pregnancy, termination of pregnancy, or in utero treatment, mode of delivery, place of delivery, post-partum management of problems like P.P.H, retained placenta and counseling of the parents regarding management of the problem, prognosis and risk of recurrence and at the same time we can give genetic counseling to the couple. An additional important application is the detection of deformation secondary to uterine constraining. If the fetus is in an unusual lie, a careful ultrasound examination should be done also to determine if deformation related to abnormal positioning are present. At the same time we can also know the fetal wellbeing and maturity of the fetus.

The present study aimed to ascertain the incidence of various etiological factors, maternal complications and associated foetal anomalies in cases of polyhydromnios

## MATERIAL AND METHODS

The present prospective study was conducted on fifty pregnant women with polyhydromnios which were clinically suspected and confirmed by USG. All cases of over distended uterus (clinically suspected hydromnios were scanned, those cases confirmed by ultrasound) were taken for study. The study was conducted over a period of 1 year from July 2013 to June 2014 in Government maternity hospital, Hyderabad. Ethical clearance was obtained from the Hospital Ethical Committee and informed consent was taken from the patients before the start of the study. Ultrasound that was used in this study was real time ultrasound scanner using linear array transducer with the patient in supine position.

The cases were taken after clinical examination. The criteria for diagnosing hydromnios was single amniotic fluid pocket vertical diameter 8 cm and more than 8 cm at any period of gestation on ultrasound examination. The cases we graded into mild, moderate and severe according to the definitions proposed by hill and associates from Mayo's clinic depending upon the

<sup>1</sup>Assistant Professor, Government Maternity Hospital, Petlaburj, Hyderabad, <sup>2</sup>Associate Professor, Kurnool Medical College, Kurnool, India

**Corresponding author:** Dr. Ananthlakshmi, Assistant Professor, Government Maternity Hospital, Petlaburj, Hyderabad, India

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size of the amniotic pocket measured in four quadrants with electronic calipers of the ultrasound system. Mild hydromnios is 25-29 cms, Moderate hydromnios is 30-34cms, Severe hydromnios is 35- or more. These patients that were taken under study were followed until delivery to estimate the complications during delivery and to know fetal outcome.

### STATISTICAL ANALYSIS

Microsoft office 2007 was used for the making tables. Descriptive statistics like mean and percentages were used to infer data.

### RESULTS

Table-1 shows the grading of hydromnios based on age distribution, Socio-Economic status, parity, amniotic fluid pocket vertical diameter, various religions, history of consanguinity. In the present study majority of women are between the age of 20-25 years of about 46% and next commonly seen age group was being 26-30 years. Between age group 20-30 the number of cases observed were 72%. It was observed that majority of these patients belonged to class 3 and class 4 i.e of about 94%. In this study regarding gravidity of these patients high incidence of hydromnios was seen in primi gravida (30%) and in 2<sup>nd</sup> gravida about 28%, in 3<sup>rd</sup> gravida about 22%, in 4<sup>th</sup> gravida about 12% and in grand multi about 8%. In present study incidence of hydromnios of mild variety is being 62% and severe variety is only 8%. In all cases of severe hydromnios association of congenital anomalies of fetus was seen. In this study, majority of the patients belonged to Hindu religion (70%), next were muslims (28%), least commonly observed in Christian patients (2%). History of consanguineous marriage was present in about 16 cases of which about 9 cases were 1<sup>o</sup> relative (56.2%) and 7 were 2<sup>o</sup> relatives(43.8%).

Table-2 shows grading of hydromnios in relation to gestational age, in relation to polyhydromnios, in relation to number of fetuses, based on maternal condition. In the present study, the various gestational periods at random was taken and most of the women were between 33-36 weeks (32%), between 28-32 weeks (14%). In the present study most of the cases were idiopathic ie, about 60% of cases, congenital anomalies were found in about 20% of cases, 8% were multiple pregnancies, 10% diabetic and 2% erythroblastosis foetalis. Most of the cases in this study hydromnios was seen with singleton pregnancies i.e about 92%. Among multiple pregnancies twins were seen in 6% and triplets 2%, among twins monozygotic twins were 4% and dizygotic twins were 2%.In the present study about 64% of the patients had anaemia. The others maternal condition observed in this study were diabetes 10%, Rh isoimmunisation 2% and urinary tract infection in 2% of the cases.

Out of 10 cases of congenital anomalies 4 cases (40%) were anencephaly. 3 cases (30%) of anencephaly are associated with meningo myelocele. Out of 10 cases, 4 cases are hydrocephalus, 30% associated with meningocele, cleft lip, cleft palate and one case with absent ears. The anomalies that were not detected on ultrasound examination but detected at the time of birth were absence of ears and meningocele (Table-3). In the present study among 50 cases of polyhydromnios studied, total number of congenital anomalies were 10, out of which 1 case was not detected by ultrasound. It was missed, making the ultrasonic

Age Group (in years)	Number of cases	Percentage
15- 19	11	22%
20-25	23	46%
26-30	13	26%
31-35	01	2%
36-40	02	4%
Socio-Economic Status		
Class-1	03	6%
Class-2	--	--
Class-3	17	34%
Class-4	30	60%
Parity		
Primi	15	30%
2 <sup>nd</sup> gravid	14	28%
3 <sup>rd</sup> gravid	11	22%
4 <sup>th</sup> gravid	06	12%
Grand Multi	04	08%
Liquor		
Mild (25-29 cms)	31	62%
Moderate (30-34 cms)	10	20%
Severe (35 and above)	4	8%
Religion		
Hindus	35	70%
Muslims	14	28%
Christians	01	02%
History of consanguineous marriage		
Absent	34	68%
Present	16	32%
In 1 <sup>st</sup> degree relatives	09	56.2%
In 2 <sup>nd</sup> degree relatives	07	43.8%

Table-1: Demographic data

Gestational Age (weeks)	Number of cases	Percentage
0-28	07	14%
28-32	07	14%
33-36	16	32%
37-40	20	40%
Cause		
Unknown Causes (Idiopathic)	--	60%
Congenital malformation of foetus		
gestational diabetes	--	8%
Erythroblastosis Foetalis	--	10%
Acute Hydromnios	--	02%
Gestations		
Single ton pregnancies	46	92%
Twins	03	08%
Monozygotic twins	02	04%
Dizygotic twins	01	02%
Triplets	01	02%
Maternal condition		
Anaemia	--	64%
Toxemia of pregnancy	--	22%
Diabetes	--	10%
Rh isoimmunisation	--	02%
UTI	--	02%

Table-2: Grading of hydromnios

accuracy in detecting congenital anomalies of the fetus was being 90%.

Structural Anomaly	Detected by U.S.G	Found at birth	Not detected by U.S.G
Anencephaly	7	--	--
Meningomyelocele	3	1	1
Hydrocephalus	4	--	--
Encephalocele foetal ascites	1	--	--
Clift lip, cleft plate	1	--	--
Ears Absent	--	1	1
Polydectly	--	--	--
Trachio Oesophageal fistula	--	--	--
Posterior urethral valves	--	--	--
Hydronephrosis congenital talipes, equinovarus	--	--	--
Total	16	2	2
Studies	Detected	Not detected	Accuracy
50	10	1	90% <sub>s</sub>

Table-3: Structural anomalies

Mode of delivery	Number of cases	Percentage
Abdominal L.S.C.S	11	22%
Vaginal	39	78%
Aided	7	18%
Un-aided	32	82%
Complications		
Premature rupture of membranes	4	8%
Abruption placenta	2	4%
Hypotonic uterine inertia	2	4%
Atonic post partum haemorrhage	6	12%
Adherent placenta	36	72%
Intra Uterus deaths		
Preterm foetus <37 weeks	30	60%
Mature foetus ≥37 weeks	20	40%
Birth Weight (Kgs)		
1-1.5	10	20%
1.5-2.0	13	26%
2.0-2.5	15	30%
2.5-3.0	08	16%
3.0-3.5	02	04%
3.5-4.0	02	04%
Cause of deaths		
Congenital Anomalies	90	18%
Incompatible with life prematurity	05	10%
Birth trauma	02	04%
Intra uterine growth retardation	01	02%

Table-4: Mode of delivery

Table-4 shows mode of delivery in 50 cases of polyhydromnios, complications during delivery, term and preterm labour, intra uterus death, birth weight of foetuses, various causes of prenatal deaths. Regarding the mode of delivery in these cases 11 cases were delivered by lower segment cesarean section, 39 cases were by vaginal delivery, out of which 7 cases (18%) were by forceps deliveries and vaccum extractions and rest of them 32 cases (82%) were normal vaginal deliveries. In the present study it was observed as intra uterine death in 6% of cases and preterm fetuses in 60% of cases and mature fetuses in 40% cases. Among them 31 were male fetuses 29 were female fetuses. The birth weight of fetuses in the present study were as follows: Between 1-1.5 kg 20%, between 1.5-2.0 kg 26%, between 2-2.5 kg 30% (higher incidence) between 2.5-3 kg 16%, but 3-3.5 kg 4% and between 3.5-4 kg also 4%. In majority of the cases the perinatal

death was found to be due to prematurity (34%). In the rest of the cases the death were due to congenital anomalies incompatible with life (20%), birth trauma (6%) and dysmaturity 2%.

## DISCUSSION

The present prospective study comprised of fifty cases of polyhydromnios that were taken from the obstetrics department of government maternity hospital petlaburj hyderabad and which were confirmed by ultrasound only were taken for the study. All these 50 cases were screened for congenital malformation of the fetus and the results were given in detail. Out of 50 cases studies 46% were in the age group of 20-25 years. 26% between 26-30 years 22% below 19 years, 2% between 31-35 years and 4% in 36-40 years age group. According to the religion hindus were 70%, muslims 28 % and Christians 2%. Majority of the patients in this study belonged to low socio economic status 60% and rest are middle class (34%) and higher class (6%).

Regarding the gravidity 70% were multigravidae, 30% were primigravidae and 8% of grand multitis. These cases of hydromnios were graded by detection of vertical diameters of amniotic fluid pockets by ultrasonogram. It was observed that mild hydromnios (25-29 cms) in 20% of cases and severe hydromnios (35 cm and above) in 8% of cases was present. Most of these patients were from rural areas (Table-1). The present study was correlated with the study of Hill and his colleagues from mayo's clinic.<sup>4</sup> According to Carlson DE<sup>5</sup> the criteria for diagnosing hydramnios was amniotic fluid pocket size 8cm or more at any period of gestation. Regarding the various ethological factors found in hydromnios in the present study no cause was found in 60% of cases and in 40 % of cases the following were probable causes. Congenital malformation 20% diabetes 10% multiple gestation 8% and Rh isoimmunisation in 2% of the cases. Maternal conditions associated with hydromnios in the present study were anaemia 64%, toxemia of pregnancy 22% other material conditions that were associated with polyhydromnios was 2% of cases with Rh isoimmunisation and others 2% with urinary tract infection. In the present study singleton pregnancies was found in 92% of cases and twin pregnancies in 6% and triplets in 2% (Table-2). Out of 3 cases of twin pregnancies 2 were monogygotic twins and 1 dizygotic twins. So hydromnios seems to be more common in monozygotic twins. Hydromnios was found in these cases at about 30-32 weeks of gestation and these cases were managed by bedrest and haematinics. Among 4 cases of multiple gestation, 2 cases of twins had uneventful

vaginal deliveries at 37 to 38 weeks of gestation. The weight of these babies were between 1.8kg to 2.3kg and they were healthy. There was no perinatal mortality observed in these cases. One case had preterm labour at 35 weeks of gestation and both babies were alive with birth weight 1.5kg and 1.2kg. another case of triplets was undiagnosed and was misdiagnosed as twins three babies were alive at birth age 2-4 and birth weight 1kg, 1.2kg, and 1kg.2. This case had preterm labour at 33 weeks gestation and three babies died of prematurity. The amniotic fluid pocket vertical diameter in Hill study<sup>7</sup> was mild 80% moderate 17% severe 5%. Beverly Hashimoto and colleagues<sup>8</sup> in their study of ultrasound evaluation of polyhydramnios – twin gestation was identified in 25% of cases; but in present study the incidence was somewhat low ie, 8%. According to the incidence of congenital malformation in twin pregnancy it was found to be 6-7% but in the present study there was no congenital anomaly detected in multiple gestation. they also stated that polyhydramnios associated with monozygotic twins, the incidence of congenital anomalies of the fetus was high. As such these patients must be closely scrutinized to exclude congenital anomalies of fetus. Another study of Stoll CG et al<sup>9</sup> shows that the frequency of congenital malformation was nearly twice in multiple pregnancies, when compared to singleton pregnancies. In this study the association of diabetes with polyhydramnios is being 25-50%. Among the 5 cases, 2 cases were clinically established insulin dependent diabetes mellitus. One patient's blood sugar was under control. One patient was on insulin therapy throughout the pregnancy. She had a bad obstetric history. (4<sup>th</sup> gravida with previous 3 pregnancy losses.) Patient had intrauterine growth restriction. Pregnancy was terminated at 38 weeks of gestation by elective L.S.C.S in view of B.O.H and I.U.G.R. an alive female child with dysmaturity weighting 2.5 kg was delivered and the baby is alive and well. Other cases of diabetes were under control with diet alone. Patients had uneventful deliveries at term, babies were mature, alive and weighing about 2-2.5kg each. The gross structural fetal anomalies detected in this study were 20%, most common anomalies that were observed in polyhydramnios were being open neural tube defects. Out of 10 cases of congenital anomalies that were detected, 6 cases were anencephaly out of which 2 cases were associated with meningocele, 3 cases were hydrocephalus, out of which 1 case had absent of ears and eyes along with hydrocephalus. Remaining one case with hydropsfetalis (Table-3).

All anencephalus cases were accurately diagnosed by ultrasonogram (100%). In all these, the pregnancies were terminated soon after diagnosis. All were female fetuses. Over all accuracy rate of ultrasonography to detect structural abnormalities of the fetus in this study was 90% whereas Hotta M<sup>10</sup> reported the incidence as 75%: In the present study 3 cases of hydrocephalus were observed. All were diagnosed antenatally by ultrasonogram out of these 3 cases 2 cases presented as cephalic and one presented as breech. In cases of cephalic presentations CSF tapping was done and delivered subsequently. 1 patient had atonic P.P.H which was managed by the routine measures. 2 case of mild hydrocephalus detected in the present study were associated with meningocele which was not detected ultrasonographically. One case of hydrocephalus that was detected in the present study, ears and eyes were absent with cleft lip and palate. One case of fetal

ascites was detected in this study. Out of 50 cases, 78% had vaginal delivery and the rest of 22% had caesarean section.

Indication for caesarean section in these cases was mostly obstetric cause. Among 50 cases, 36% had preterm vaginal deliveries and rest of 64% had term deliveries. The gross perinatal mortality encountered in this study was 34%. The various causes for perinatal mortality was being congenital malformations incompatible with life in 1 case, Birth trauma in 2 cases; prematurity in 5 cases; dysmaturity in 1 case (Table-4).

## CONCLUSION

This study ascertained the incidence of various etiological factors, maternal complications and fetal anomalies associated with polyhydramnios. The technical innovations in the medical field should be utilised properly. At least all the Government maternity Hospitals should be provided with high resolution ultrasound units and trained technical personnel so that routine ultrasonography will be offered to all the antenatal patients.

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