

Perinatal Outcome and Congenital Anomalies due to Polyhydramnios –A prospective study in a South Indian Setup

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Abstract

Background: The amniotic fluid which sheathes the fetus acts to be a protective shroud. Fetal well-being is embodied by the amniotic fluid index. If the amniotic fluid index exceeds 25cms, it leads to polyhydramnios resulting in high rate of perinatal mortality and congenital malformations.

Objectives: To evaluate the occurrence of congenital malformations and report perinatal outcome in polyhydramnios.

Study Design: A Prospective study was conducted in Neonatal intensive care unit and gynecology wards of Owaisi Hospital and Research Centre for a period of 2 years.

Methods: 50 cases of polyhydramnios were evaluated and followed up based on amniotic fluid index which was measured by conducting ultrasound scans; congenital malformations were observed both by ante natal and post natal ultrasound scans. The perinatal outcome such as congenital anomalies, fetal distress, mortality etc was recorded.

Results: 50 cases of Polyhydramnios formed the study population. Congenital malformations were found in 12% neonates of which Diaphragmatic hernia and hydrops fetalis were most commonly noted. 8% neonatal deaths were recognized. 2% cases with fetal distress were observed. If amniotic fluid index exceeded 30cms there was increased mortality rate and congenital malformations.

Conclusion: Attributable to Polyhydramnios, risk of congenital malformations, neonatal mortality and fetal distress was often observed and risks were greater with amniotic fluid index over 30cms.

Keywords: Polyhydramnios; Congenital anomalies; Neonatal mortality, Amniotic fluid.

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Introduction

Amniotic fluid or liquor amnii is the protective liquid accommodated in the amniotic sac throughout pregnancy. Amniotic fluid acts as a shield to the fetus by safeguarding the mother's abdomen, it enables fetal movements to be easier and nurtures skeletal development, it protects from infection, helps in the growth of lungs and formation of urine and meconium.

Polyhydramnios is defined as amniotic fluid index more than 25 cm.⁽¹⁾ The incidence of polyhydramnios ranges from 0.5-1.5% of all pregnancies.^(2,3) Congenital malformations occurs more likely due to polyhydramnios and affects nearly all organ systems. But, more commonly these malformations are associated with systems that implicates absorption of fluids and gulp down in the fetus.^(4,5) The persistent anomalies noted are Anencephaly, duodenal or esophageal atresia and renal agenesis. With regard to amniotic fluid index, the more severe the polyhydramnios, greater is the occurrence of congenital anomalies and deficient perinatal outcome. The purpose of this study was to evaluate the incidence of congenital malformations and to report the perinatal outcome in pregnant women with polyhydramnios.

Materials and Methods

Study Site and Study Duration: This prospective study was conducted in the neonatal intensive care unit

and the maternity wards of Owaisi Hospital and Research Centre, Hyderabad. The study period was 2 years (Jan 2015-Jan 2017) 50 newborns were included in this study. Ultrasonography scans was used to determine the amniotic fluid index and authenticate as polyhydramnios. A detailed obstetric and gynec history and clinical examination such as postnatal ultrasound scans, x rays, CT scans were done depending on the patients condition and history provided.

Study population: A prospective study was conducted in 50 newborns with congenital abnormality formed the **inclusion criteria** whereas newborns with either no congenital abnormality, fetal death and still birth were excluded from the study.

Randomization, Masking and plan of work: Ultrasonography scan was used to determine the amniotic fluid index and authenticate polyhydramnios. The Amniotic fluid index was analyzed by placing the patient supine; the uterus was observed as four equal quadrants. The ultrasound was converted perpendicular to the plane of the floor and aligned longitudinally with the patients' spine, vertical depth of the largest amniotic fluid pocket was studied and the amniotic fluid index was calculated from the sum of four quadrant pocket depths. Congenital anomalies were identified by an antenatal ultrasound and recorded and other investigations were done post natively if required the

outcome was determined by following up the newborn in the neonatal wards.

Data Analysis: Data with a normal distribution were summarized as mean ± standard deviation. The Chi square test and Single Sample T test Calculator was used to calculate the statistical significance of the data obtained. P value was obtained at P <0.10 which was considered statistically significant.

Ethical Approval: was provided by the Hospital Ethics Committee. All participants provided written informed consent.

Table 1: Congenital malformations observed in polyhydramnios in relation to AFI

Amniotic fluid index	Cases	Congenital malformations
25-30	35(31.06) [0.5]	06(9.94)[1.56]
>30	15(18.94)[0.82]	10(6.06)[2.56]
Total	50	16

The Chi Square Statistic is 5.441. The P Value is 0.01967. This result is significant at p<0.10

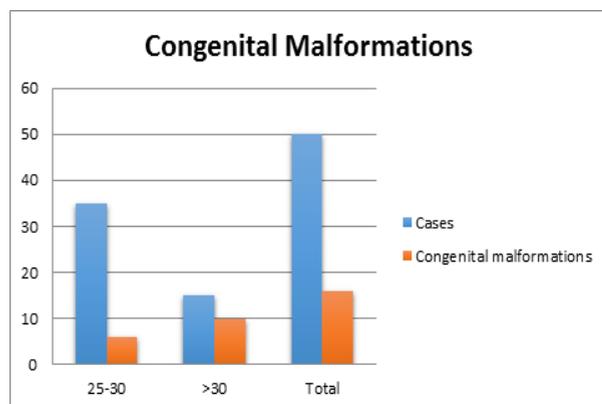


Fig. 1: Congenital malformations observed in polyhydramnios in relation to AFI

Table 2: Neonatal mortality detected in polyhydramnios in relation to AFI

Amniotic fluid index	Cases	New Born Mortality
25-30	35(33.04)[0.12]	02(3.96)[0.97]
>30	15(16.96)[0.23]	04(2.04)[1.9]
Total	50	06

The Chi Square Statistic is 3.212. The P Value is 0.07306. This result is significant at p<0.10

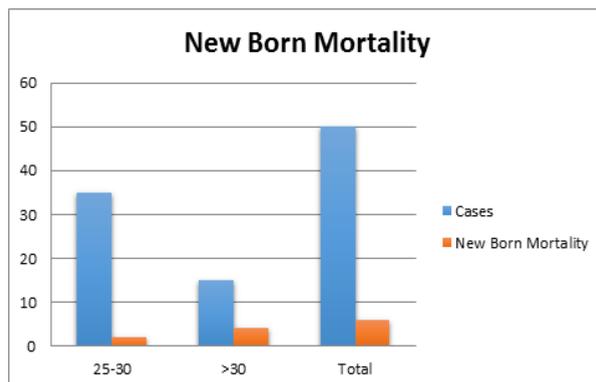


Fig. 2: Neonatal mortality detected in polyhydramnios in relation to AFI

Table 3: Neonatal Outcome & polyhydramnios

Neonatal Outcome	No. of Cases (%)
Congenital Malformation	06(12)
Gastrointestinal Abnormalities (Oesophageal atresia/ duodenal atresia)	02 (4)
Bochdalek's hernia (Non development of Pleuro peritoneal membranes)	01(2)
Antenatal Bartter Syndrome (Fetal Renal Disorder)	02(4)
Anencephaly (Neurological abnormalities)	01(2)
Down's & Edwards Syndrome (Chromosomal Abnormality)	01(2)
Skeletal Dysplasia (Dwarfism)	01(2)
Cord Prolapse	01(2)
Placental abruption	02(4)
Premature birth	02(4)
Perinatal Death	01(2)
Hydrops Fetalis	01(2)
Micrognathia	01(2)

Single Sample T test Calculator was used to calculate P Value for the above table with one tailed hypothesis. The T- Value is -61.00. The P-value is <0.00001. The result is significant at P < 0.10.

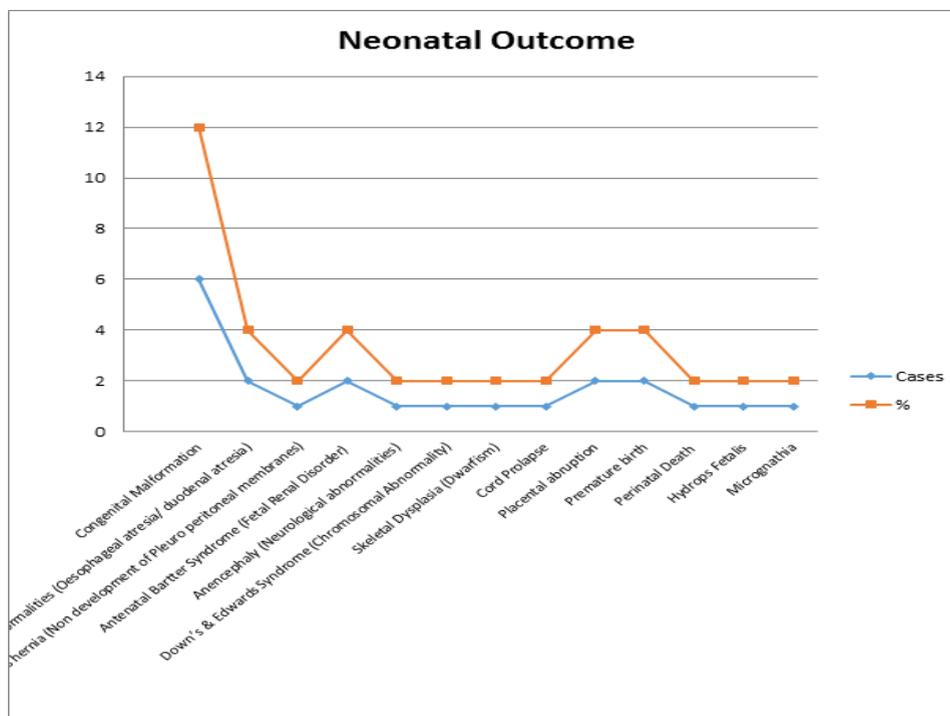


Fig. 3: Neonatal Outcome & polyhydramnios

Results

In our study amidst 50 cases of polyhydramnios; congenital malformations were observed in 16 cases (32%). The new born mortality was 6 (12%), 2 cases each of diaphragmatic hernia and hydrops fetalis, 1 case each of micrognathia, duodenal atresia and anencephaly were also observed. 8 newborns (16%) had fetal distress. The mode of delivery was Caesarean in 18 (36%). The total number of cases, were further classified on the basis of the amniotic fluid index as more than 30cms (15 cases) and between 25-30cms (35 cases).

Discussion

Various studies on Polyhydromnios were supervised to obtain a deliberate data. Congenital anomalies were identified in 16 newborns among 50 cases of polyhydramnios included in our study which corresponds to a significant high risk of 32% which was found comparable with studies conducted by Romero Gutierrez⁽⁶⁾ (24%), Ben-Chetrit A⁽⁷⁾ (21.8%), Lyndon M Hill⁽⁸⁾ (20%), R William Quinlan⁽⁹⁾ (18%) and Desmedt Els⁽⁴⁾ (17.8%) nevertheless the incidence of congenital anomalies were lower in the studies conducted by Shabnam⁽¹⁰⁾ (2.8%), Kaukab Tashfeen⁽¹¹⁾ (8.1%), Joseph R Biggo⁽¹²⁾ (8.4%), Dashe⁽¹³⁾ (11%) and Lazebnik⁽¹⁴⁾ (14.5%).

A study conducted by Desmedt Els,⁽⁴⁾ shows 20 percent of the congenital anomalies not detected by an antenatal ultrasound, whereas in our study all reported congenital anomalies were detected by an antenatal ultrasound. There were 2 preterm deliveries (4%) in our

study and 7.7% preterm deliveries in a study conducted by Shabnam.⁽¹⁰⁾ Fetal distress was observed during 2 deliveries (4%) in our study with contrast to 4.1% in a study conducted by Baron.⁽¹⁵⁾ The mode of delivery was caesarean in 18 newborns (36%) in our study which was found to be similar to 27.9% observed in a study by Shabnam.⁽¹⁰⁾

The perinatal mortality was 2% in our study, which was significantly lower than the perinatal mortality observed in studies by Stoll⁽⁵⁾ (4.3%), Desmedt Els⁽⁴⁾ (4.9%) and Lyndon M Hill⁽⁸⁾ (7%).

Conclusion

Polyhydramnios, an estate in pregnant women should be initially detected as its frequent association with fetal malformations and perinatal mortality is high. Antenatal ultrasound scans is found to be accurate and easiest method to detect congenital anomalies. In severe polyhydramnios when the amniotic fluid index exceeds 30cm, there are chances of congenital malformations as well as perinatal mortality showing a risk of 50%. With the risk of fetal distress also being significant. The perinatal outcome is mostly influenced by repeated evaluation of amniotic fluid index and regular antenatal checkups of those pregnant women in which polyhydramnios is well identified. Counseling the patients about the outcome of polyhydromnios is very important.

Conflict of Interest

The authors have no conflicts of interest to declare.

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References

1. Cunningham FG, Leveno KJ, Bloom SL, et al. Disorders of amniotic fluid volume. In: Cunningham FG, Leveno KL, Bloom SL, et al, eds. Williams Obstetrics. 23rd Ed. New York, NY: McGraw-Hill; 2010: chap 21.
2. Brace RA, Wolf EJ. Normal amniotic fluid volume changes throughout pregnancy. *Am J Obstet Gynecol.* 1989 Aug;161(2):382-8.
3. Brady K, Polzin WJ, Kopelman JN, Read JA. Risk of chromosomal abnormalities in patients with idiopathic polyhydramnios. *Obstet Gynecol.* 1992 Feb;79(2):234-8.
4. Desmedt EJ, Henry OA, Beischer NA. Polyhydramnios and associated maternal and fetal complications in singleton pregnancies. *Br J Obstet Gynaecol* 1990;97:1115-22.
5. Claude G. Stoll, Yves Alembik, Beatrice Dott, Study of 156 cases of polyhydramnios and congenital malformations in a series of 118,265 consecutive births. *Am J Obstet and Gynecol.* 1991 September;165(3): Pg 586-90.
6. Romero Gutierrez G, Fuentes Paramo H, Membrilla Alfaro E, Vargas Huerta M. Ultrasonographic diagnosis of polyhydramnios and its association with congenital malformations. *Ginecol Obstet Mex.* 1996 Jan;64:1-5.
7. Ben-Chetrit A, Hochner-Celnikier D, Ron M, Yagel S. Hydramnios in the third trimester of pregnancy: a change in the distribution of accompanying fetal anomalies as a result of early ultrasonographic prenatal diagnosis. *Am J Obstet Gynecol.* 1990 May;162(5):1344-5.
8. Hill, Lyndon M, Breckle, R, Thomas Marion L, Fries, Joanne K Polyhydramnios: Ultrasonically Detected Prevalence and Neonatal Outcome. *Obstet Gynecol.* 1987;69:21-25.
9. Quinlan RW, Cruz AC, Martin M. Hydramnios: ultrasound diagnosis and its impact on perinatal management and pregnancy outcome. *Am J Obstet Gynecol.* 1983 Feb 1;145(3):306-11.
10. Shabnam MM, Syed S, Rizvi G. Polyhydramnios: Risk factors and outcome. *Saudi Med J.* 2008;29:256-60.
11. Kaukab Tashfeen and Ilham Moosa Hamdi Polyhydramnios as a Predictor of Adverse Pregnancy Outcomes *Sultan Qaboos Univ Med J.* 2013 February;13(1):57-62.
12. Biggo JR, Wenstrom KD, Dubard MB, Cliver SP. Hydramnios prediction of adverse perinatal outcome. *Obstet Gynecol.* 1999;94:773-7.