



**ORIGINAL RESEARCH PAPER**

**Obstetrics & Gynaecology**

**EVALUATION OF AMNIOTIC FLUID INDEX AND ITS PREGNANCY OUTCOME IN A TERTIARY CARE CENTER.**

**KEY WORDS:** Amniotic fluid index, Oligohydramnios, Polyhydramnios

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**ABSTRACT**

**Background:** Amniotic fluid assessment is an integral part of the antenatal evaluation of pregnancies at risk for an adverse pregnancy outcome especially in the third trimester.

**Methods:** This was prospective observational study conducted at tertiary teaching institute from January 2018 to December 2020. Total 350 patients were included in the study. On the basis of amniotic fluid index (AFI), patients were categorized in 3 groups, Normal AFI (6-24 cm), oligohydramnios (AFI <5cm) and polyhydramnios (AFI > 25 cm). Results were analysed in the form of incidence, mode of delivery and perinatal outcome which includes preterm, low birth weight, still births, NICU admissions and neonatal deaths in all the 3 groups

**Results:** Out of 350 patients, there was 270 cases of normal AFI, 57 cases of oligohydramnios and 23 cases of polyhydramnios. PIH was the most common etiological factor found in oligohydramnios (33.3%) and in polyhydramnios idiopathic cause (56.5%) was most common. Incidence of NICU admission was 32.4% in oligohydramnios and 55.5% in polyhydramnios group in comparison to 12.4% in normal AFI group.

**Conclusions:** Amniotic fluid index is an important part of antepartum fetal surveillance. Abnormalities of AFI are associated with high perinatal morbidity and mortality and maternal morbidity.

**INTRODUCTION**

Amniotic fluid acts as a protective layer which exerts a cushion-like effect for the growing fetus against mechanical and biological injury. Amniotic fluid may be regarded as the largest part of the fetal extracellular space, and it provides a more accessible means than fetal blood for investigation of the fetus and its environment. Amniotic fluid assessment is an integral part of the antenatal evaluation of pregnancies at risk for an adverse pregnancy outcome especially in the third trimester [1, 2]. Reduced amniotic fluid volume (AFV) is associated with adverse effects such as meconium staining, congenital anomalies, growth retardation, dysmaturity, and fetal asphyxia. Polyhydramnios is sometimes associated with major fetal anomalies, aneuploidy, macrosomia, and stillbirth [3-5].

As these disorders of liquor amnii has a significant impact on pregnancy and fetus, we are conducting this study to find out its effect on pregnancy outcome.

**METHODS**

This study is a prospective observational study done at tertiary teaching institute. From January 2018 to December 2020. During this study period, 350 patients were selected at our tertiary care centre. All routine antenatal investigations were done. AFI (Amniotic Fluid Index) was measured by four quadrant technique by USG and patients were grouped as normal (AFI 6-24 cm), oligohydramnios (AFI < 5 cm) and polyhydramnios (AFI > 25 cm). Cases were managed accordingly in 3 groups. Data were analysed in terms of incidence, etiology, mode of delivery, and perinatal outcome in the form of live births, still births, NICU admissions and neonatal mortality in all the three groups. The rate of each outcome was calculated in all the three groups and then the two groups that is oligohydramnios and polyhydramnios are compared with normal AFI group.

**INCLUSION CRITERIA**

- Antenatal patients in third trimester.
- Ready to give a consent

**EXCLUSION CRITERIA**

- Antenatal patients having premature rupture of membranes.

**RESULTS**

Out of total 350 patients, 270 patients were with normal AFI, 57 patients were with oligohydramnios and 23 patients were with polyhydramnios.

**Table 1: Number of patients in different groups.**

Normal AFI	Oligohydramnios	Polyhydramnios	Total number of patients
270	57	23	350

In oligohydramnios, main etiological factor found was PIH (33.33%), whereas in polyhydramnios, idiopathic was most common etiology (56.6%) were the most common associated factor was congenital anomalies.

**Table 2: Associated conditions**

Associated conditions	Normal AFI (%)	Oligohydramnios (%)	Polyhydramnios (%)
Pregnancy induced hypertension	29 (10.7%)	19 (33.33%)	2 (8.6%)
Intrauterine growth restriction (IUGR)	18 (6.6%)	16 (28%)	-
Congenital Anomaly	9 (3.3%)	1 (1.7%)	6 (26%)
Postdatism	11 (4%)	8 (14%)	-
Diabetes	15 (5.5%)	1 (1.7%)	2 (8.6%)
Idiopathic	-	12 (21%)	13 (56.5%)

Preterm delivery seen in 28 cases (49.1%) in oligohydramnios, 22 cases (95.6%) in polyhydramnios and 51 cases (18.8%) in normal AFI group.

Caesarean section was done in 39 cases (68.4%) in oligohydramnios, 9 cases (39.1%) in polyhydramnios in comparison to 56 cases (20.7%) in normal AFI group.

**Table 3: Indications of caesarean section.**

Indications	Normal AFI	Oligohydramnios	Polyhydramnios
Fetal distress	29	36	5
Pre-eclampsia	10	1	-
IUGR	1	2	-
Malpresentation	5	-	-
Prolonged labour	1	-	1
Cephalopelvic disproportion (CPD)	6	-	1
Antepartum haemorrhage (APH)	4	-	2

Majority of LSCS were done for fetal distress and preeclampsia. Fetal distress in the form of meconium stained liquor, fetal bradycardia or tachycardia were more in patients with abnormal liquor that is 92.3% in oligohydramnios and 55.55% in polyhydramnios as compared to normal liquor 51.7%.

A total 7 neonatal deaths occurred in normal AFI group, 6 in oligohydramnios group and 4 in polyhydramnios group.

**Table 4: Perinatal outcome.**

Perinatal outcome	Live birth	Still birth	Neonatal death
Normal AFI	259	4	7
Oligohydramnios	48	3	6
Polyhydramnios	17	2	4

**Table 5: Perinatal morbidity.**

Outcome	Low birth weight			Low APGAR			NICU admission		
	Normal	Oligo	Poly	Normal	Oligo	Poly	Normal	Oligo	Poly
Present study	33.3%	70%	88.4%	2.3%	26.6%	31.3%	12.4%	32.4%	55.5%

A total 70% babies in oligohydramnios group and 88.4% in polyhydramnios group were of LBW (<2.5 kg), in comparison to 33.3% in normal AFI group. APGAR score was low (< 7 at 5 min) in 26.6% of patients with oligohydramnios and 31.3% in polyhydramnios in comparison to 2.3% in normal AFI group (Table 5). NICU admission seen in 32.4% in oligohydramnios and 55.5% in polyhydramnios group in comparison to 12.4% in normal AFI group. In our study one maternal death occurred due to septicaemia in oligohydramnios group.

**DISCUSSION**

In present study, in majority of cases, the cause of oligohydramnios was PIH followed by IUGR and idiopathic. The most common cause for polyhydramnios was idiopathic. Study by Queenan and Gandow and Fawad A et al, on oligohydramnios also showed the results comparable with our study while the study on polyhydramnios by Akhter et al and Rajsriya et al showed that congenital anomalies cause was more common followed by idiopathic (6-9).

Preterm delivery was seen in 49.1% patients with oligohydramnios which is comparable with the study by Garmel and co-workers showing oligohydramnios prior to 37 weeks due to PIH, IUGR had a threefold increase in preterm births (10).

Incidence of Low birth weight was higher in patients with oligohydramnios and polyhydramnios that is 70% and 88.4% respectively as compared to normal AFI (33.3%). Akhter et al, showed 40% LBW babies in patients with normal liquor while 60% babies with LBW in patients with oligohydramnios (7). Chen KC et al, showed 22.6% babies with LBW in polyhydramnios compared to 6.1% in patients with normal liquor (11).

Low APGAR score was significantly higher in patients with oligohydramnios and polyhydramnios that is 26.6%

and 31.3% respectively compared to normal liquor (2.3%). In a study on oligohydramnios by Jandial C et al, showed 12% babies with low APGAR score while Chen KC et al study on polyhydramnios showed 11.1% babies with Low APGAR score which is also comparable with our study (11,12).

There was 32.4% and 55.5% NICU admissions in oligohydramnios and polyhydramnios respectively as compared to 12.4% in patients with normal AFI. Sadovsky et al, study on oligohydramnios showed 17% NICU admissions and Chen KC et al study on polyhydramnios showed 18.6% NICU admissions (11,13).

**CONCLUSION**

Abnormalities of AFI both reduced and excess liquor are associated with high maternal morbidity and perinatal morbidity and mortality. Ultrasonography proved to be an important tool for early and accurate diagnosis of oligo and polyhydramnios and also to rule out congenital malformations and hence to improve maternal and fetal outcome. AFI abnormalities demands intensive fetal surveillance and proper antepartum and intrapartum care. Timely decision for intervention is helpful in reducing perinatal morbidity and mortality.

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**REFERENCES**

- Magann EF, Chauhan SP, Bofil JA, et al. Comparability of the amniotic fluid index and single deepest pocket measurement in clinical practice. *Aust N Z J Obstet Gynecol.* 2003;43:75-7.
- Kofinas A, Kofinas G. Differences in amniotic fluid pattern and fetal biometric parameters in third trimester pregnancies with and without diabetes. *J Matern Fetal Neonatal Med.* 2006;19(10):633-8.
- Moore TR. Amniotic fluid dynamics reflect fetal and maternal health and disease. *Obstet Gynecol.* 2010;116:759-65.
- Hashimoto BE, Kramer DJ, Brennan L. Amniotic fluid volume: fluid dynamics and measurement technique. *Semin Ultrasound CTMR.* 1993;14:40-55.
- Sarno AP Jr, Ahn MO, Phelan JP. Intrapartum amniotic fluid volume at term. *J Reprod Med.* 1990;35:719-23.
- Fawad A, Danish N. Frequency, causes and outcome of polyhydramnios. *Gomal J Med Sci.* 2008;8:2.
- Akhter H, Guha K, Daisy KP. Amniotic fluid Index in high risk pregnancies and pregnancy outcome. *Dinajpur Med Col.* 2010;3(1):1-5.
- Sriya R, Singhai S, Rajan M. Perinatal outcome in patients with amniotic fluid index < 5cm. *J Obstet Gynaecol India.* 2001;51(5):98-100.
- Queenan JT. Polyhydramnios and oligohydramnios. *Contemp Obstet Gynecol.* 1991;36:60.
- Garmel SH, Chelmsow D, Sandra JS, Roan JT, D'Alton ME. Oligohydramnios and the appropriately grown fetus. *Am J Perinatol.* 1997;14(06):359-63.
- Chen KC, Liou JD, Hung TH, Kuo DM, Hsu JJ, Hsieh CC, et al. Perinatal outcomes of polyhydramnios without associated congenital fetal anomalies after the gestational age of 20 weeks. *Chang Gung Med J.* 2005;28(4):222-5.
- Jandial C, Gupta S, Sharma S, Gupta M. Perinatal outcome after antepartum diagnosis of oligohydramnios at or beyond 34 weeks of gestation. *JK Sci.* 2007;9(4):213-4.
- Sadovsky YO, Christensen MW, Scheerer LO, Crombleholme WR. Cord-containing amniotic fluid pocket: a useful measurement in the management of oligohydramnios. *Obstet Gynecol.* 1992;80(5):775-7.