

# Amniotic Fluid Index in Predicting the Pregnancy Outcomes: A Prospective Hospital Based Study

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## ABSTRACT

**Background:** Amniotic fluid is vital to the well-being of the fetus. Oligohydramnios or reduced amount of amniotic fluid volume is a commonly observed obstetric problem during third trimester of pregnancy. It accompanies a broad range of reproductive disorders including anomalies of fetus and functional disorders of mother, fetus and placenta.

**Aim and objectives:** To find out incidence of polyhydramnios and oligohydramnios in our setup and to discover various possible etiological factors for abnormal AFI.

**Material and Methods:** We performed a study on 90 patients over a period of one year. Study was conducted in the department of Obstetrics and Gynaecology, Pacific medical college & hospital, Bhilo ka bedla, Udaipur. Detailed history, general examination and local examination were done. All the cases were subjected to ultrasonography to see for maturity, AFI, congenital anomalies. Analysis was made regarding mode of delivery and perinatal outcome.

**Results:** There were total 32 cases of oligohydramnios and 13 cases of polyhydramnios and 45 cases with normal AFI. In ultrasonography, 68 cases had full term maturity and 22 cases were preterm. 37 cases had AFI  $\leq 5$  cm, 8 cases had AFI  $\geq 24$ , and 45 cases had AFI between 6-23.

**Conclusion:** Amniotic fluid index assessment has become an important part of ante-partum fetal surveillance and also continuous intrapartum fetal monitoring and good neonatal care support is essential for optimum perinatal outcome.

**Key words:** Maternal Outcome, Amniotic Fluid Index, Polyhydramnios, Oligohydramnios.


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## INTRODUCTION

Amniotic liquid is key to the prosperity of the baby. It pads the hatchling from damage, counteracts pressure of the umbilical line, and enables space for it to move and grow. Moreover, its bacteriostatic activity anticipates disease of the intra-amniotic condition. The quantity of amniotic fluid at any time in gestation is the product of water exchange between the mother, fetus, and placenta, and is maintained within a relatively narrow range. Disorders of this regulatory process can lead to either polyhydramnios or oligohydramnios, in which too much or too little fluid exists, respectively. Oligohydramnios or reduced volume of amniotic fluid poses challenge to obstetrician, when it is diagnosed before term. Oligohydramnios can develop in any trimester, although it is more common in third trimester.<sup>1</sup>

These disorders may result from abnormal fetal or maternal conditions and, conversely, may be responsible for alterations of fetal well-being as well. With the advent of real-time ultrasonography, assessment of amniotic fluid has been possible, resulting in earlier recognition of abnormal conditions and possible

intervention. Since, these disorders of liquor amnii has a significant impact on pregnancy and fetus, it prompted us to carry out this study with sincere efforts to find out its effect on pregnancy outcome.<sup>2,3</sup>

## MATERIALS AND METHODS

We performed a study on 125 patients over a period of one year. Out of 125, only 90 patients completed our study on the basis of inclusion and exclusion criteria. The Study was conducted in the Department of Obstetrics and Gynaecology, Pacific Medical College & Hospital, Bhilo ka bedla, Udaipur.

Detailed history was taken. Cases were enquired for any complaints of decrease fetal movement, leaking per vaginam, abdominal pain, pressure symptoms or symptoms of pre-eclampsia. Particular enquiry was done about the last menstrual period (to rule out wrong dates). History of polyhydramnios or oligohydramnios in past pregnancy, any malpresentation or congenital anomalies to the previous baby was also inquired.

History was also taken regarding any medical disorders like diabetes mellitus, thyroid, and hypertension. General examination of each patient was done with attention to vitals, weight, Cardio and Respiratory System.

All the cases were subjected to ultrasonography to see for

maturity, AFI. Fetal evaluation included daily fetal movement count, non-stress test, ultrasound, and antenatal Doppler (selected cases) with continuous monitoring of FHS. Depending upon the severity of condition decision regarding induction of labour or elective / emergency LSCS were taken.

**Table 1: Maternal characteristics of study population**

Group	Oligohydramnios	Polyhydramnios	Normal AFI
<b>Incidence</b>			
No. of cases	32	13	45
<b>Age-wise Distribution</b>			
<20 years	1	2	12
21-29 years	25	4	24
≥30 years	6	7	9
<b>Gestational age</b>			
28-32 weeks	2	3	3
33-36 weeks	4	1	10
37-40 weeks	18	7	24
≥40 weeks	8	2	8
<b>Admission Status</b>			
Emergency	22	7	25
Booked	10	6	20
Total	32	13	45
<b>Mode of Delivery</b>			
LSCS	18	4	13
Vaginal	14	9	32

**Table 2: Distribution of cases in relation to clinical presentation**

Group	Oligohydramnios	Polyhydramnios	Normal AFI
Decreased fetal movement	6	-	1
Leaking per vaginum	5	2	7
Abdominal pain	4	6	34
Pressure symptoms	-	1	-
No complains (Diagnosed clinically/ USG)	12	3	-
Headache/ edema feet	5	1	3

## RESULTS AND DISCUSSION

90 patients over a period of one year were studied. There were total 32 cases of oligohydramnios and 13 cases of polyhydramnios and 45 cases with normal AFI as per Table – 1.

In the present study, majority of patients suffering from Oligohydramnios were in the age group 20 to 29 years, as compared to other age groups. Thus 78% of cases of oligohydramnios in the present study were between 21 to 30 years of age. In one study 142 cases of oligohydramnios were studied and the mean maternal age found was  $23.9 \pm 5.9$  years.<sup>4</sup> One study showed that mean maternal age was  $22.8 \pm 4.2$  years.<sup>5</sup> Also 56% of women with polyhydramnios were in the age group of 26 to 30 years. One study reported that 52% of cases were between the age group of 25 to 30 years which was comparable to our study.<sup>6</sup>

Incidence of Polyhydramnios is higher with maternal age more than 30 years. Only 480 cases of abnormal AFI were found in our

institute during the study duration of one year. Incidence of oligohydramnios was 4.7% and polyhydramnios was 1.2%. Whereas in other studies, incidence of oligohydramnios was found to be 3.9% and 3.1%.<sup>7,8</sup> Incidence of polyhydramnios according to one study was 2%,<sup>9</sup> which is in accordance to our study.

As per Table 1, majority of the patients that was 68% of oligohydramnios and 53% of polyhydramnios were emergency admissions and many were referred. In the one study, the percentage of emergency admissions was 55% and 45% respectively.<sup>9</sup>

Present study showed that 59% cases were primi para and 26% were 2<sup>nd</sup> para of oligohydramnios, thus incidence of oligohydramnios is more common in primi gravida patients. Study conducted by Donald D. Meintire, et al. in April 2000 on oligohydramnios showed 40% cases in his study were primi para patients. In the present study polyhydramnios was found more in

multi gravida i.e. 57% of cases in 2<sup>nd</sup> para and 25% were 3<sup>rd</sup> para, so 82% of cases in the present study were multi gravida suggesting that incidence of polyhydramnios was more in multi gravida cases. One study mentioned there was significant rise in polyhydramnios with advanced maternal age, in their study 12.2% of subjects were over 40 years old and were that of multi gravid.<sup>10</sup> In present study, there were 18 cases (56%) of oligohydramnios occurs in the 37 to 40 weeks as per Table – 1. One author mentioned that oligohydramnios developing early in pregnancy is less common and frequently has a poor prognosis. By contrast, in pregnancies that continue beyond term, diminished fluid volume may be found often. There were 7 case of polyhydramnios occurred in the 37 to 40 weeks. One study mentioned mean gestation age for polyhydramnios was 38.6 ± 1.2 weeks.<sup>11</sup> Another study pointed that mean gestation age for polyhydramnios was 40.3 ± 1.6 weeks.<sup>12</sup> In the present study, in cases of oligohydramnios, 6 cases presented with decrease fetal movement, 5 cases presented with leaking per vaginum, 4 cases presented with abdominal pain, 12 cases diagnosed clinically or by use of oligohydramnios, whereas in case of polyhydramnios, 2 cases presented with leaking per vaginum, 6 cases presented with abdominal pain, 1 case presented with pressure symptoms, 3 cases diagnosed by ultrasound as per Table 2. So, majority of patients with

oligohydramnios at the time of presentation were symptomless which were diagnosed clinically or by ultrasonography, and majority of patients of polyhydramnios were presented with abdominal pain.

In the present study majority of cases, the cause of oligohydramnios is idiopathic in 11 cases, preeclampsia in 8 cases. Table 3. For polyhydramnios 6 cases were idiopathic type accounts for majority of the cases. These findings are in accordance with the previous similar study that most common etiological factor was idiopathic in 68 cases, followed by congenital in 13 followed by GDM in 7 cases.<sup>13</sup>

Thus, the most common etiological factor for oligohydramnios is idiopathic which is followed by PIH and post datism, the most common cause for polyhydramnios is also idiopathic followed by congenital anomalies followed by diabetes. This is in accordance with the previous studies.<sup>10-12</sup>

In our study, in oligohydramnios, there were total 26 cases of vertex presentation, 4 cases of breech presentation. So, there were more chances of abnormal presentation in case of oligohydramnios as compared to cases with normal AFI. In case of polyhydramnios there were total 7 cases of vertex presentation, and 3 cases with abnormal presentation, so there were even more chances of abnormal presentation compared to normal AFI cases. (Table 4)

**Table 3: Distribution of cases according to associated maternal conditions**

Group	Oligohydramnios	Polyhydramnios	Normal AFI
Pre-eclampsia	8	1	3
Anemia	1	-	4
Multiple pregnancy	-	-	1
Diabetes	1	2	1
Rh incompatibility	-	1	-
Post dated	6	1	5
PROM	2	-	6
Congenital and chromosomal anomalies	1	2	-
Cardiac disease	1	-	-
Idiopathic	11	6	24
Thyroid disorders	1	-	1

**Table 4: Distribution of cases in relation to presentation of fetus**

Group	Vertex	Breech	Other	Total
Oligohydramnios	26	4	2	32
Polyhydramnios	7	3	3	13
Normal AFI	38	5	2	45

**Table 5: Ultrasonographic findings in study population**

USG Findings		
Maturity	Preterm	22
	Full term	68
AFI	≤5	37
	6-23	45
	≥24	8

**Table 6: Post-partum maternal complications in study group**

Complications	Oligohydramnios	Polyhydramnios	Normal AFI
Atonic PPH	-	1	1
Puerperal pyrexia	4	1	-
DIC	1	-	1
Anemia	1	1	4
Sub involution	3	1	2
Uncomplicated	23	9	37
Total	32	13	45

Ultrasonography was done in all cases (n=90), all patients had AFI as measured by 4 gradient technique. 68 cases had full term maturity and 22 cases were preterm, 37 cases had AFI  $\leq$  5 cm, 8 cases had AFI  $\geq$  24, and 45 cases had AFI between 6-23. (Table 5) As per Table 6, majority of post-partum complications associated with oligohydramnios were puerperal pyrexia in 4 cases which were associated with PROM, DIC in 1 case which were associated with PIH, Anemia in 1 case.

In present study, 89% of babies were live of abnormal AFI, 2% babies were still birth, and 9% babies were PNM.

### CONCLUSION

Thus, we concluded that amniotic fluid index assessment is an essential part of ante-partum fetal surveillance and also it has a prognostic value for fetal and newborn outcome. With advent of ultrasonography, the incidence of oligohydramnios seems to be on rise since almost all cases diagnosed nowadays which were previously undetected, and incidence of polyhydramnios decreases because of early detection of anomalies like anencephaly by ultrasonography. Thus, USG and Doppler have revolutionized the diagnosis and management of patients with abnormal AFI. Timely intervention by an obstetrician definitely will help in improving perinatal outcome.

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