

# Oligohydramnios And Its Perinatal Outcome

Dr Faaizah Husain

(Assistant Professor, Department Of Obstetrics And Gynaecology, Gmers-Godhra, Panchmahal)

---

## Abstract:

**Background:** Oligohydramnios is one of the major causes of perinatal morbidity and mortality. The sonographic diagnosis of oligohydramnios is usually based on an AFI  $\leq 5$  cm or on a single deepest pocket of amniotic fluid  $\leq 2$  cm<sup>3</sup>. Our study was aimed to study the perinatal outcome in oligohydramnios.

**Aim & Objectives:** To study obstetric risk factors associated with oligohydramnios and maternal outcome in the form of mode of delivery, and to assess neonatal complications in terms of APGAR score at birth, NICU admission rates, meconium stained liquor and still birth rates.

**Materials and Methods:** It was an Observational, Prospective, clinical study of 200 pregnant patients diagnosed with oligohydramnios by ultrasound, carried out in GMERS-Godhra, Panchmahal for period of 1 year. Detailed history on demographic profile, medical illness, obstetric history and antenatal complication if any in the present pregnancy; general examination, obstetric examination and bimanual examination were performed meticulously.

**Results:** Our study 53% cases of oligohydramnios were associated with some of the risk factors like PIH (54.29%), IUGR (42.86%), fetal anomaly (2.86%), systemic maternal disease (2.86%) and 47% of the cases were Idiopathic. LSCS was done in 85.71% cases with AFI  $< 5$  cm. Low birth weight was found in 51.43% cases with AFI  $< 5$  cm. NICU admission was required for 28.57% cases with AFI  $< 5$  cm.

**Conclusion:** AFI is an important and convenient screening test for prediction of perinatal outcome. In presence of oligohydramnios, the risk of fetal distress, operative delivery, low Apgar score, low birth weight, perinatal morbidity and mortality are more. Hence early detection of oligohydramnios, associated antenatal risk factors and timely management can improve the maternal and fetal outcome.

**Key Word:** Oligohydramnios, Amniotic fluid index, pregnancy induced hypertension, IUGR

---

Date of Submission: 29-02-2025

Date of Acceptance: 09-03-2025

---

## I. Introduction

Amniotic fluid has an important role in protecting fetus, providing nutrients and in the development of lungs and gastrointestinal tract. It has bacteriostatic properties also.<sup>1</sup> Amniotic fluid protects the growing fetus by cushioning effect against mechanical and biological injuries and facilitating growth.

Amniotic Volume levels peaks to 800-1000ml at 28-32 weeks then slowly decreases and plateaus near term with further reduction to only 400 ml at 42 weeks.<sup>3</sup> Amniotic fluid can easily be monitored by ultrasound by amniotic fluid index (AFI) or single largest pocket (SLP). Amniotic fluid volume is calculated by adding largest pockets in all four equal uterine quadrants. The sonographic diagnosis of oligohydramnios is usually based on an AFI  $\leq 5$  cm or on a single deepest pocket of amniotic fluid  $\leq 2$  cm (American College of Obstetricians and Gynecologists, 2012).<sup>3</sup> Phelan defined oligohydramnios as AFI less than or equal to 5 cm and 5.1 to 20cm as normal.<sup>4</sup>

In chronic placental insufficiency, there is brain sparing effect and reshuffling of blood flow at cost of renal and hepatic supply. This leads to reduced fetal urine output leading to oligohydramnios. So oligohydramnios is an indirect marker of placental insufficiency.

Long standing effects of decrease amniotic fluid includes pulmonary hypoplasia, potter's syndrome, club foot, club hand and dislocation of hip. High incidence of maternal and perinatal morbidity and mortality are associated with oligohydramnios.<sup>5</sup>

Many studies showed association between decreased amniotic fluid volume and still birth, fetal anomaly, abnormal FHR tracings in labor, increase in cesarean section for fetal distress, fetal hypoxia and acidosis.<sup>6</sup>

Antenatal fetal assessment includes fetal movement count, AFI or SLP, biophysical profile, non-stress test (NST) and fetal Doppler. AFI is one of the components of biophysical profile so important marker of fetal well-being.

Perinatal outcome in the form of meconium staining, IUGR, cesarean section for abnormal FHR tracing, low Apgar score and neonatal intensive care unit admission have been associated with reduced amniotic fluid volume.<sup>7</sup>

It has been observed that antepartum or intra partum AFI  $\leq 5$  cm is associated with a significant increase in lower segment caesarean section for fetal distress and low APGAR score at 5 minutes (APGAR score  $< 5$ ).<sup>8</sup>

### **Aim And Objectives**

To study obstetric risk factors associated with oligohydramnios and maternal outcome in the form of mode of delivery. And to assess neonatal complications in terms of APGAR score at birth, NICU admission rates, meconium stained liquor and still birth rates.

The objective of the study was to evaluate mode of delivery in oligohydramnios, perinatal outcome in the form of meconium stained liquor, APGAR score, NICU admission and still birth and maternal risk factors associated with oligohydramnios.

## **II. Material And Methods**

It was an Observational, Prospective and clinical study of 200 patients diagnosed with oligohydramnios by ultrasound, carried out in GMERS-Godhra, Panchmahal from March 2024 to February 2025. The study was conducted after ethical clearance and with informed consent in local language. Enrolled patients were subjected for a detailed history on demographic profile, medical illness, obstetric history and antenatal complication if any in the present pregnancy; general examination, obstetric examination and bimanual examination were performed. All cases underwent ultrasonography examination for estimation of amniotic fluid index by Phelen's method.

### **Inclusion criteria:**

1. Pregnant women aged  $\geq 18$  years of age.
2. All pregnant women between 24-40weeks gestation with amniotic fluid index less than 8cm in ultrasonography.

### **Exclusion criteria:**

1. Patients with history of PPRM (preterm premature rupture of membrane).
2. Various possible maternal as well as fetal outcomes studied during this observational study

### **Maternal Outcome**

#### **1.Antenatal complications**

- a) PIH (pregnancy induced hypertension)
- b) IUGR (intra uterine growth retardation)
- c) APH (antepartum hemorrhage)
- d) PROM (pre-term rupture of membrane)
- e) Any other

#### **2.Mode of delivery**

- a) Spontaneous/induced Vaginal Delivery.
- b) Caesarean Section
- c) Instrumental delivery- Forceps and Ventouse

### **Neonatal Outcomes**

- a) Birth weight, Sex, Apgar Score, Gestational Age
- b) Meconium stained liquor
- c) Birth asphyxia
- d) Any other neonatal complication

### **Statistical analysis**

Data was analyzed using SPSS version 20 (SPSS Inc., Chicago, IL). Sample size of 200 mothers was considered by using statistical formula. The difference was considered significant at  $P < 0.05$  and highly significant at  $P < 0.01$ . The data was entered in MS excel sheet windows 10. Student t test and z test of proportion was be used for analysis with help of SPSS IBM version 20.

## **III. Result**

A total of 200 cases were observed for the study: 70 in Group 1 (AFI  $\leq 5$ ) and 130 in Group 2 (AFI  $> 5$ ).

Mean maternal age in group 1 was  $25.43 \pm 3.41$  and in Group 2 it was  $27.62 \pm 4.15$  years and the difference in age was found to be statistically significant ( $P = 0.009$ ). (Table 1)

Mean gestational age in Group 1 was  $38.07 \pm 2.20$  and in group 2 was  $37.85 \pm 2.22$  weeks and difference was found to be statistically insignificant ( $P = 0.636$ ). (Table 1)

Also, a Mean ANC visit in Group 1 was  $9.71 \pm 2.09$  and in group 2 was  $9.81 \pm 2.09$  times and difference was also found to be statistically insignificant ( $P = 0.820$ ). (Table 1)

**Table no 1: Maternal Demography**

Maternal Demography	Group 1 AFI $\leq 5$ N=70	Group2 AFI $> 5$ N=130	P value
Mean maternal age	$25.43 \pm 3.41$	$27.62 \pm 4.15$	0.009
Mean gestational age	$38.07 \pm 2.20$	$37.85 \pm 2.22$	0.636
Mean ANC visits	$9.71 \pm 2.09$	$9.81 \pm 2.09$	0.820

38 (54.29%) women in group 1 PIH and 20 (15.00%) had PIH in group 2 and difference was found to be statistically significant ( $P < 0.001$ ).

IUGR was found in 30 (42.86%) and 14 (10.76%) among women of group 1 and group 2 respectively and difference was found to be statistically significant ( $P < 0.001$ ).

LSCS delivery was done in 60 (85.71%) women of group 1 and 80 (61.54%) women of group 2 and difference was also found to be statistically significant ( $P = 0.022$ ). (TABLE 2)

**Table no2 : Antepartum complication**

Antepartum complication	Group 1 AFI $\leq 5$ N=70	Group2 AFI $> 5$ N=130	P value
PIH	38 (54.29%)	20 (15.00%)	$< 0.001$
IUGR	30 (42.86%)	14 (10.76%)	$< 0.001$
Fetal anomaly	2 (2.86%)	0	-
Maternal disease	2 (2.86%)	0	-
LSCS	60 (85.71%)	80 (61.54%)	0.022

Among group 1, oligohydramnios was found in 100% women and was found to be the main indication of LSCS followed by PIH in 26 (43.33%), IUGR in 22 (36.67%), breech in 10 (16.67%) and previous LSCS in 6 (10.0%) each and fetal distress in 2 (3.33%) women whereas in group 2, oligohydramnios was found in 90% women and was found to be the main indication of LSCS followed by previous LSCS in 24 (30.0%) and breech, fetal distress, PIH and IUGR in 10 (12.5%) women respectively. Thus, overall statistically significant difference in proportion of women among groups regarding PIH and IUGR was found ( $P < 0.05$ ). (TABLE 3)

**Table no 3 : Indications of LSCS**

Indications of LSCS	Group 1 AFI $\leq 5$ N=60	Group2 AFI $> 5$ N=80	P value
Oligohydramnios	60(100%)	72(90.0%)	0.206
Breech	10(16.67%)	10(12.5%)	0.882
Fetal Distress	2(3.33%)	10(12.5%)	0.355
PIH	26(43.33%)	10(12.5%)	0.008
IUGR	22(36.67%)	10(12.5%)	0.036
Previous LSCS	6(10.0%)	24(30.0%)	0.085

Perinatal outcomes were also studied in both the groups and it was observed that 6 (8.57%) women in group 1 and 10 (7.69%) women in group 2 had meconium stained liquor and the difference was found to be statistically insignificant ( $P = 0.817$ ).

Low birth weight was found in 36 (51.43%) cases in group 1 and 24 (18.46%) cases in group 2 and this difference was found to be statistically significant ( $P = 0.001$ ).

NICU admission was required for 20 (28.57%) in group 1 and 12 (9.23%) in group 2 and this difference was found to be statistically significant ( $P = 0.026$ ).

Mean birth weight was found to be  $2.57 \pm 0.47$ kg in group 1 and  $2.76 \pm 0.64$  kg in group 2 and this difference was found to be statistically significant ( $P = 0.002$ ). (TABLE 4)

**Table no 4: Perinatal outcome**

Perinatal outcome	Group 1 AFI $\leq 5$ N=70	Group2 AFI $> 5$ N=130	P value
Meconium stained liquor	6 (8.57%)	10 (7.69%)	0.817
LBW	36 (51.43%)	24 (18.46%)	0.001
NICU admission	20 (28.57%)	12 (9.23%)	0.026
Mean Birth Weight	$2.57 \pm 0.47$	$2.76 \pm 0.64$	0.002

#### **IV. Discussion**

Amniotic fluid is important marker for fetal wellbeing. Oligohydramnios is associated with many maternal and fetal factors, like PIH, IUGR, maternal systemic disease, fetal anomalies, and unexplained. In our study, amniotic fluid volume was assessed by ultrasonography using amniotic fluid index. Majority of study participants were in age group between 20-30 years. Demographic factors like age, parity, religion and gestational age were comparable in both groups.

In our study Mean maternal age in group 1 was  $25.43 \pm 3.41$  and in Group 2 was  $27.62 \pm 4.15$  years, which is similar to mean maternal age of  $22.48 \pm 3.4$  in a study by panda et al.<sup>9</sup> Mean gestational age in Group 1 was  $38.07 \pm 2.20$  which is similar to Mean gestational age of  $38.85 \pm 1.57$  in a study by panda et al.<sup>9</sup> These findings indicates that the problem of oligohydramnios was more common in later part of pregnancy.

In present study, 38 (54.29%) women had associated pregnancy induced hypertension (PIH) in group 1 (AFI < 5cm) and 20 (15.00%) had associated PIH in group 2 (AFI > 5cm) and difference was found to be statistically significant ( $P < 0.001$ ); compared to 38.46% and 31% PIH associated with oligohydramnios in study by Chandra P et al.<sup>10</sup> and Sriya R et al.<sup>11</sup> In our study IUGR was found in 30 (42.86%) and 14 (10.76%) among women of group 1 and group 2 respectively and difference was found to be statistically significant ( $P < 0.001$ ); compared to 61% cases of IUGR in study by Dalal N et al.<sup>12</sup> which shows significant correlation between oligohydramnios and IUGR. In our study association of PIH, IUGR was seen more with group 1 compared to group 2.

In our study, LSCS delivery was done in 60 (85.71%) women of group 1 and 80 (61.54%) women of group 2 and difference was also found to be statistically significant ( $P = 0.022$ ); compared to 64% LSCS in study by Chate P et al.<sup>13</sup> . in our study main indications for LSCS were fetal distress, associated antepartum complications like, PIH, IUGR and previous LSCS, breech.

In our study, perinatal outcomes were also studied in terms of meconium stained liquor, low birth weight, NICU admission in both the groups. Meconium stained liquor was observed in 6 (8.57%) women in group 1 and 10 (7.69%) women in group 2 and the difference was found to be statistically insignificant ( $P = 0.817$ ); Similar studies conducted by Baron et al.<sup>14</sup> and Voxman et al.<sup>15</sup> concluded that there is no difference between the groups with regard to meconium-stained liquor.

In present study, Low birth weight (LBW) was found in 36 (51.43%) cases in group 1 and 24 (18.46%) cases in group 2 and this difference was found to be statistically significant ( $P = 0.001$ ); which is comparable to study by panda et al.<sup>9</sup> showing LBW in 32 % in group 1 and 12 % in group 2 women, indicating oligohydramnios had an association with fetal growth restriction.

In our study, NICU admission was required for 20 (28.57%) in group 1 and 12 (9.23%) in group 2 and this difference was found to be statistically significant ( $P = 0.026$ ). which is comparable to study by panda et al.<sup>9</sup> where NICU admission among babies in group 1 versus group 2 was 34 (24 %) versus 56 (12 %), and this was found to be statistically significant ( $p = 0.020$ ).

In our study, we found oligohydramnios was associated with 43.33% cases of PIH. IUGR was found to be in 36.67% cases of oligohydramnios followed by 2.87% cases were due to fetal anomaly and 2.87% cases due to maternal disease. Thus 53% cases of oligohydramnios were associated with some of the risk factors and 47% of the cases were Idiopathic. Panda et al.<sup>9</sup> found PIH among 17 %, IUGR among 18%, postdatism in 11% and 54% cases were idiopathic.

#### **V. Conclusion**

AFI is an important and convenient screening test for prediction of perinatal outcome. In presence of oligohydramnios, the risk of fetal distress, operative delivery, low Apgar score, low birth weight, perinatal morbidity and mortality are more. Hence early detection of oligohydramnios, associated antenatal risk factors and timely management can improve the maternal and fetal outcome. Isolated oligohydramnios in the absence of any other maternal or fetal complicating factor is found to increase the operative intervention and adversely affect the fetal outcome. Hence, prevention of isolated oligohydramnios without any complicating factor is an area of further research.

#### **References**

- [1]. Ghimire S, Ghimire A, Chapagain S, Paudel S. Pregnancy Outcome In Cases Of Oligohydramnios After 28 Weeks Of Gestation. *International Journal Of Advanced Medical And Health Research*. 2016 Feb 1;3(2):68.
- [2]. Bansal V, Bansal A, Bansal AK. Effectiveness Of L-Arginine In Oligohydramnios On Amniotic Fluid Index. *World Journal Of Pharmaceutical Research*. 2015 July;4(8):1354-1358.
- [3]. American College Of Obstetricians And Gynecologists. Antepartum Fetal Surveillance. *ACOG Practice Bulletin*. 1999 Oct;9:275-85.
- [4]. Phelan JP, Smith CV, Broussard P, Small M. Amniotic Fluid Volume Assessment With The Four-Quadrant Technique At 36-42 Weeks' Gestation. *Journal Of Reproductive Medicine For The Obstetrician And Gynecologist*. 1987 Jan 1;32(7):540-2.
- [5]. Bansal D, Deodhar P. A Clinical Study Of Maternal And Perinatal Outcome In Oligohydramnios. *J Res Med Den Sci*. 2015 Oct 1;3(4):312-6.

- [6]. Chamberlain PF, Manning FA, Morrison I, Harman CR, Lang CR. The Relationship Of Marginal And Decreased Amniotic Fluid Volumes To Perinatal Outcome. *Am J Obstet Gynecol.* 1984;150(3):245-9.
- [7]. Cunningham FG, Gant NF, Leveno KJ, Gilstrap LC, Hauth JC, Wenstrom KD. *Obstetrical Hemorrhage.* Williams Obstetrics 21st Edition. Ed., Macdonald PC.
- [8]. Kahkhaie KR, Keikha F, Keikhaie KR, Abdollahimohammad A, Salehin S. Perinatal Outcome After Diagnosis Of Oligohydramnios At Term. *Iranian Red Crescent Medical Journal.* 2014 May;16(5).
- [9]. Panda S, Jayalakshmi M, Kumari GS, Mahalakshmi G, Srujan Y, Anusha V. Oligoamnios And Perinatal Outcome. *The Journal Of Obstetrics And Gynecology Of India.* 2017 Apr 1;67(2):104-8.
- [10]. Chandra P, Kaur SP, Hans DK, Kapila AK. The Impact Of Amniotic Fluid Volume Assessed Intrapartum On Perinatal Outcome. *Obstet Gynaecol.* 2000 Aug;5(8):178-81.
- [11]. Sriya R, Singhai S, Rajan M. Perinatal Outcome In Patients With Amniotic Fluid Index < 5cm. *J Obstet Gynaecol India.* 2001;51(5):98-100.
- [12]. Dalal N, Malhotra A. Perinatal Outcome In Cases Of Severe Oligohydramnios. *International Journal Of Reproduction, Contraception, Obstetrics And Gynecology.* 2019;8(4):1539.
- [13]. Chate P, Khatri M, Hariharan C. Pregnancy Outcome After Diagnosis Of Oligohydramnios At Term. *Int J Reprod Contracept Obstet Gynecol.* 2013 Mar;2(1):23-6.
- [14]. Baron C, Morgan MA, Garite TJ. The Impact Of Amniotic Fluid Volume Assessed Intrapartum On Perinatal Outcome. *American Journal Of Obstetrics And Gynecology.* 1995 Jul 1;173(1):167-74.
- [15]. Voxman EG, Tran S, Wing DA. Low Amniotic Fluid Index As A Predictor Of Adverse Perinatal Outcome. *Journal Of Perinatology.* 2002 Jun;22(4):282-5.