

# Association of Adverse Perinatal Outcome with Oligohydramnios during Third Trimester of Pregnancy

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## ABSTRACT

**Background:** For the growth and development of the unborn child, amniotic fluid is absolutely necessary. Strong interactions between the fetus, placenta, and parts of the mother are given their volume<sup>1</sup>. Oligohydramnios is defined as having an amniotic fluid index (AFI) <5th percentile or AFI 5 cm during pregnancy and no water at a depth of 23 cm before the cornea. This is a common problem that occurs in 35% of pregnancies during childbirth<sup>2</sup>.

**Aim:** To determine the correlation between oligohydramnios in pregnant women who are late in pregnancy (3rd trimester) and adverse birth outcomes such as partial surgery, decreased Apgar score, and lower birth weight.

**Study design:** Cohort study

**Study set up:** Obstetrics and Gynecology Department, Fatima Memorial Hospital Lahore.

**Study period:** six months starting 15-01-2022 to 14-07-2022

**Methods:** 242 females were enrolled. Two groups of participants were created: group II had normal AFI and group I had oligohydramnios. Females given intra venous fluids to group I after ruling out any contra indication. The perinatal result was then documented. SPSS version 20 was used to enter and evaluate all of the gathered data.

**Results:** In exposed group the mean age was 27.79±6.72 years, whereas in unexposed group the mean age was 28.25±6.77 years. The C-section was done in 124(51.2%) females. RR = 0.693 [1.25-3.49] While the Low Birth Weight and poor APGAR score has shown protective effect.

**Practical implication:** Oligohydramnios means decreased amniotic fluid around the fetus. There is deficiency of amniotic fluid < 200 ml at a time. Approximately 8-10% of pregnant ladies may have decreased level of amniotic fluid but 5% have been confirmed diagnosis of oligohydramnios.

**Conclusion:** So complications of surgery are directly related to the severity of oligohydramnios in pregnant women while low birth weight and poor APGAR scores has shown protective effect in women presented in last trimester of pregnancy.

**Keywords:** Oligohydramnios, Low Birth Weight, Perinatal Outcome, APGAR SCORES, Pregnancy

## INTRODUCTION

Amniotic fluid gives protection to the fetus and it is essential for the development and growth of the fetus. Strong communication between placenta, fetus and mother is needed to maintain its level<sup>1</sup>. Having an amniotic fluid index is what is meant by oligohydramnios (AFI) <5th percentile or AFI 5 cm during pregnancy and no liquid cm depth of 23 packs. This is a common problem that occurs in 35% of pregnancies during pregnancy<sup>2</sup>. Amniotic fluid level can be decreased in any trimester but it is most commonly seen in the latter stage of pregnancy. It has a connection to variety of birth defects such as fetal malformations and fetal, maternal and placental abnormalities<sup>3</sup>.

Amniotic fluid can be measured in a variety of ways. Initially amniotic fluid was measured by amniocentesis which was difficult to perform and nowadays ultrasonic devices are used to measure amniotic fluid which include a single deep packet (SDP) process, 2-meter packs, and AFI because it is non-invasive and easy to perform. <sup>4</sup>Decrease in amniotic fluid volume has association with arrhythmias abnormal meconium retrieval, Apgar <7 points, and the introduction of the newborn care unit. Different studies have shown LSCS incidence was 54% in patients with lower amniotic fluid volume and 23% in patients whose amniotic fluid volume is normal. This was statistically significant ( $p < 0.001$ )<sup>7</sup>. Another case-control research reveals that 64% of people had LSCS. decreased amniotic fluid volume group and 22% in normal amniotic fluid volume group. This was statistically significant ( $p < 0.001$ ). Apgar scores of 7 or less in 5 minutes were found in 16% and 6% of oligohydramnios cases and the standard AFI group, respectively ( $p > 0.05$ ).

**Low Birth Weight:** <2.5kg observed in 62% cases of patients with decreased amniotic fluid volume while in patients with normal amniotic fluid volume it is observed in 28% cases. ( $p < 0.001$ )<sup>8</sup>. Myocardial infarction is the most common cause of

oligohydramnios. However, because amniotic fluid is primarily in the urine of babies during late pregnancy, slow fetal production and obstruction of the baby's urinary tract can also cause oligohydramnios. Physical swallowing in infants reduces water content, and a lack of swallowing or blockage in the intestines can lead to polyhydramnios. Newborns produce 5,00-1,200 ml of urine and ingest 210-790 ml of amniotic fluid a day<sup>17</sup>.

Causes of oligohydramnios are: Pediatric urinary tract infections, etc. B. Renal aplasia, polycystic kidney disease and other obstruction of the urinary tract (such as the posterior urethral valves)<sup>18</sup>. Maternal diabetes or post mature syndrome when pregnancy lasts 42 weeks of pregnancy. (18) Common clinical features are short-term sensory sensitivity, unnecessary exposure to fetal components, and decreased volume of amniotic fluid. Hypoplasia and intrauterine impairment development. The amniotic membrane nodosum is also present (a lump in the area of the fetal amniotic membrane)<sup>9</sup>. There is controversy regarding association of oligohydramnios with pregnancy complications<sup>10</sup>. Absent or decrease in amniotic fluid volume associated with Potter Syndrome characterized by abnormal facial features, pulmonary hypoplasia and paralysis. A two-year-old genealogy of a baby is the most common cause of a baby's urinary deficiency<sup>3</sup>. The amount of amniotic fluid is tested by dividing the mother's uterus into four parts. Oligohydramnios is defined as the absence of an AFI of less than 7cm or a liquid packet of 23 cm depth in ultrasonography<sup>4,7,11</sup>. In one study, a 24-34 week decline in AFI pregnancy, including borderline AFI and oligohydramnios, was probably associated with severe fetal malformations, as well as a lack of disability, fetal development and childbirth. It's hard to prevent before severe paralysis was more common in oligohydramnios (25%) and borderline AFI pregnancy (10%) than in normal water (2%) pregnancy<sup>11</sup>. Transplantation (intravenous and oral) has been shown to significantly improve amniotic fluid volume in the third trimester by separating oligohydramnios<sup>12</sup>. There is limited literature available in local setting. Therefore, the study was to investigate the association between oligohydramnios in pregnant women with late pregnancy and adverse maternal incidence.

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**METHODOLOGY**

This cohort study was conducted in Dept. of Obstetrics & Gynecology, Fatima Memorial Hospital Lahore during six months period. Using 80% test power, a sample size of 242 cases (121 in each group), representing the expected percentage of low apgar scores—16% in women with oligohydramnios and 6% in women with normal AFI during the third trimester was calculated<sup>8</sup>.

**Sampling approach:** Consecutive, non-probability sampling

**Selection criteria:**

1. Females aged 18 to 40, with a parity of five or less, and a singleton pregnancy that manifests at 28 to 40 weeks' gestation (on LMP).
2. Group I: Transabdominal ultrasound revealed an AFI of 5cm.
3. Group II has an AFI of less than 11 cm on transabdominal ultrasonography.

**Exclusion Criteria**

1. Patients with fetal anomaly (on ultrasound).
2. PPROM or PROM patient (diagnosed on per speculum examination).
3. Individuals with gestational diabetes (BSR>186mgdl) and hypertensive pregnancies (BP140/90mmHg with or without proteinuria+1 on dipstick).
4. Patients with cephalopelvic disproportion.

**Data collection procedure:** 242 pregnant women who met the eligibility requirements were registered in the labour room of the Obstetrics and Gynecology Department at Fatima Memorial Hospital in Lahore. For the goal of using personal data for study, informed consent was acquired. Demographic data (name, age, gestational age, parity, BMI) was recorded. Participants were divided into two groups: group I had oligohydramnios, while group II had normal AFI. I provided intra venous fluids to group I after checking out any contraindication. Following that, women were monitored through delivery. It was noted whether the baby was delivered by normal vaginal birth or a caesarean section. After delivery, the neonate's Apgar score was noted at 5 minutes, and if it was below 7, it was described as having a poor Apgar score. The birthweight was measured, and LBW was identified (according to the operational definition). This data was entered into a template that was created especially for it.

**Data Analysis:** SPSS 20 was used to enter and evaluate the data. Age, gestational age, and BMI are examples of quantitative variables for which mean and standard deviation have been determined. For qualitative characteristics like parity and poor perinatal outcome, frequency and percentage were calculated (cesarean section, poor Apgar, LBW). Relative Risk (RR) was estimated to measure the connection between unfavourable perinatal outcome and oligohydramnios. Significant was defined as an RR>1 value. Age, gestational age, BMI, and parity stratified the data. After stratification, chi-square was used to examine how impact modifiers affected various perinatal outcomes. P-values lower than 0.05 were regarded as significant.

**RESULTS**

In our study, 72 (29.8%) females had low APGAR scores, of whom 25 (20.7%) were from the unexposed group and 47 (38.8%) were from the exposed group. In the exposed group, there was a 0.615 times greater protective risk of having a low APGAR score than in the unexposed group, or RR=0.615[0.436-0.867].

In this study 63 (26%) females were found to have the LBW, of whom 22 (18.2%) were from the unexposed group and 41 (33.9%) were from the exposed group. The relative risk showed 0.631 times protective risk of LBW in exposed group than to unexposed group i.e. RR=0.631 [0.440-0.907] (Table 2).

Table 2: Comparison of LBW with study groups

LBW	Study Group		Total
	Exposed	Unexposed	
Yes	41(33.9%)	22(18.2%)	63(26%)
No	80(66.1%)	99(81.8%)	179(74%)

P value 0.005, RR 0.631(0.440-0.907)

Significantly protective effect of CS in exposed group than to unexposed group when stratified by age, gestational age between 34-37 weeks and females with abnormal BMI (Table 3).

Significantly protective effect of poor APGAR score in exposed group than to unexposed group in females with age ≤ 30 years, null and primary parity, the females with 34-37 weeks of gestation, and females with normal BMI (Table 4).

Table 3: Comparison of CS with study groups stratified by age, parity, GA and BMI

CS		Study groups		P value	RR
		Exposed	Unexposed		
<b>Age (Years)</b>					
≤30	Yes	43(58.1%)	30(39.5%)	0.022	0.688 (0.49-0.96)
	No	31(41.9%)	46(60.5%)		
>30	Yes	30(63.8%)	21(46.7%)	0.098	0.703 (0.46-1.07)
	No	17(36.2%)	24(53.3%)		
<b>Parity</b>					
Primi	Yes	46(63.9%)	29(48.3%)	0.072	0.711 (0.49-1.03)
	No	26(36.1%)	31(51.7%)		
Multi	Yes	27(55.1%)	22(36.1%)	0.046	0.702 (0.49-1.01)
	No	22(44.9%)	39(63.9%)		
<b>Gestational age</b>					
34-37	Yes	42(63.6%)	28(35.4%)	0.001	0.588 (0.42-0.81)
	No	24(36.4%)	51(64.6%)		
38-40	Yes	31(56.4%)	23(54.8%)	0.875	0.96 (0.61-1.52)
	No	24(43.6%)	19(45.2%)		
<b>BMI</b>					
Abnormal	Yes	42(59.2%)	30(40%)	0.021	0.68 (0.49-0.95)
	No	29(40.8%)	45(60%)		
Normal	Yes	31(62%)	21(45.7%)	0.11	0.711 (0.47-1.08)
	No	19(38%)	25(54.3%)		

Table 2: Comparison of poor APGAR score with study groups stratified by age, parity, GA and BMI

Poor score	APGAR	Study groups		P value	RR
		Exposed	Unexposed		
<b>Age (Years)</b>					
≤30	Yes	27(36.5%)	14(18.4%)	0.013	0.600 (0.38-0.95)
	No	47(63.5%)	62(81.6%)		
>30	Yes	20(42.6%)	11(24.4%)	0.006	0.637 (0.37-1.08)
	No	27(57.4%)	34(75.6%)		
<b>Parity</b>					
Primi	Yes	27(37.5%)	9(15%)	0.004	0.47 (0.26-0.85)
	No	45(62.5%)	51(85%)		
Multi	Yes	20(40.8%)	16(26.2%)	0.105	0.73 (0.49-1.10)
	No	29(59.2%)	45(73.8%)		
<b>Gestational age</b>					
34-37	Yes	26(39.4%)	14(17.7%)	0.004	0.56 (0.36-0.88)
	No	40(60.6%)	65(82.3%)		
38-40	Yes	21(38.2%)	11(26.2%)	0.213	0.72 (0.42-1.25)
	No	34(61.8%)	31(73.8%)		
<b>BMI</b>					
Abnormal	Yes	22(31%)	15(20%)	0.127	0.74 (0.48-1.13)
	No	49(69%)	60(60%)		
Normal	Yes	25(50%)	10(21.7%)	0.004	0.48 (0.27-0.85)
	No	25(50%)	36(78.3%)		

**DISCUSSION**

This cohort study was undertaken at Unit 3 Obstetrics & Gynecology, Fatima Memorial Hospital Lahore to determine the correlation between adverse birth outcomes, Apgar scores, LBW and oligohydramnios in pregnant women at the end of pregnancy. Oligohydramnios means decreased amniotic fluid around the fetus. There is deficiency of amniotic fluid < 200 ml at a time. Approximately 8 to 10 percent of expectant women may have reduced amniotic fluid levels but 5% have been confirmed diagnosis of oligohydramnios. There are varieties of ways by which amniotic fluid can be measured. Typically, AFI testing or deep packet measurement (MPD) or high packet depth is used<sup>12,13</sup>. In this study, category c was made up of 124 (51.2%) women, 73 (60.3%) in the identified group and 51(42.1%) women in the unnamed group. It was not-i. e RR = 0.693<sup>1,17</sup>. Results from LBW and APGAR indicated a protective effect. LBW was found in 63 women (26%), 41(33%) of them. 9% were women in the identified group, and 22 women (18.2%) were in the unnamed group. eRR = 0.631 [0.4400.907]. The lowest APGAR rate was observed in 72

women (29.8%), and 47 women (38.8%) in the identified group and 25 women (20.7%) in the unidentified group i. eRR = 0.615 [0.4360.867]. Some of the studies described below show the results as they are.

Case control studies showed that LSCS cases accounted for 64% and 22%, respectively, in AFI broad groupings and oligohydramnios, respectively. The significance of this was statistical (p0.05). Standard AFI Group LBW <7 (RR, 1.85; 95% CI, 0.69-4.96), NICU (RR, 2.09; 95% CI, 0.805.45). This was statistically significant (p with 23% of oligohydramnios cases and a typical AFI group (p <10th percentile) <sup>13</sup> Babar Shrikant A and Shanbhag S. D (64) showed that women with oligohydramnios were highly correlated. and fetus intrinsic heart rate (FHR). H. Fetal depress, meconium color, Apgar <7 school, or hospitalization at NICU Additionally, those with an AFI of 5.0 cm or less had increased rate of surgery due to infant stress. A study by Jayati Nath et al. Oligohydramnios has increased rate of pregnancy complications and has been reported to be associated with increased fertility and mortality. It can help identify women and prevent pregnancy complications. Hosted by this unit. In the control group, 33% had LSCS and 67% gave birth to a vagina (SVD). In the study group, 34% had a vaginal discharge and 66% had LSCS <sup>18</sup>. In our study, 5 <7 minutes of APGAR were observed in 34% of the study group and 11% of the control group. 33% of newborns in the control group and 64% of the study group have low birth weight. Another study by Asavari Ashok Bachhav et al. In the study group, 86% of patients had oligohydramnios as their primary diagnosis, compared to 53% of patients in the control group who were born for reasons other than oligohydramnios. 33% of the control group had LSCS, while 67% didn't had a vaginal discharge. In the study group, 34% had a female genital mutilation and 66% had LSCS. In our study, 5 <7 minutes of APGAR were observed in 34% of the study group and 11% of the control group. 33% of the control group and 64% of the study group weighed less than 2.5 kg at birth. When oligohydramnios is associated with kidney development or stiffness, signs / symptoms include severe fetal degeneration due to intrauterine obstruction (Potter syndrome). Obstructive Uropathy also includes external pressure on the flat surface and fall epicanthic fold, hypertelorism, straight ears, Mongoloid tilt of palpebral fractures, wrinkles under the lower lip, and micrognathism. Creating an error. Chest compression is also possible<sup>20</sup>.

Oligohydramnios adversely affects fetal lung growth, causes pulmonary hypoplasia and often leads to death due to respiratory failure. Other side effects of the baby include genu varum, one umbilicus, gastrointestinal atresia, and small breasts after external pressure. Newborn babies are younger than the reported gestational age<sup>13</sup>. When a baby test in this clinical setting finds abdominal weight, it is usually due to multiple renal dysplasia, urinary hypertrophy, or Prune belly syndrome. [8] Predictability is usually best if polyhydramnios may be associated with other findings. According to Desmedt et al. The maternal mortality rate in polyhydramnios related to fetal or placenta deformities is 61%<sup>9</sup>. About 20% of infants with polyhydramnios have something unusual. In these cases, the prediction depends on the severity of the anomaly.

## CONCLUSION

Studies have concluded that the adverse effects of cesarean section on pregnancy are directly related with high risk of oligohydramnios in pregnant women but LBW and APGAR scores

have shown the effects of late pregnancy in pregnant women (3rd trimester).

**Conflict of interest:** Nil

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