

# A Study Of Oligohydraminos On Mode Of Delivery In Antenatal Patients Attending Tertiary Care Center

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## **Abstract:**

*Background: The amniotic fluid is the fluid that collects within the amniotic cavity surrounding the embryo. Oligohydraminos is the condition with reduced amniotic fluid. The theory is the reduced perfusion of the placenta causes hypovolemia, and automatic redistribution of fetal blood volume to vital organs resulting in reduced blood supply to kidneys leading to reduced production of urine. Oligohydramnios is a frequent complication of pregnancy that is found to be associated with a bad perinatal outcome and it affects the mode of delivery or requires interventions.*

*Aims and Objectives: To study how oligohydramnios affects mode of delivery and perinatal outcome in patients with oligohydraminos.*

*Materials and Methods: This is an observational study was conducted at government medical college, Akola-Maharashtra. 100 pregnant women attending hospital from January 2021 to December 2021 with oligohydramnios were included after permission from institutional Ethics Committee, and consents from the patients & was evaluated regarding risk factor and complications. SPSS versions 20 was used for statistical analysis.*

*Results: In patients with oligohydramnios, it was observed that there is significant rise in incidence of LSCS and there is also increased risk of complications like preterm labour, PROM, PPROM, Preeclampsia, abruption, IUGR.*

*Conclusions: Oligohydraminos is having adverse effects on pregnancy and fetal outcome. But a careful antenatal care and timely ANC visits to hospitals are very useful in cases with oligohydramnios.*

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## **I. INTRODUCTION:**

Nature has made floating bed in foam of amniotic fluid cavity filled with liquor amnii for the requirement of fetus, for its existence and growth in sterile environment, regulation of temperature, avoidance of external injury and reduction of impact of uterine contractions.

Oligohydramnios is defined as decreased amniotic fluid volume (AFV) for gestational age. The volume of amniotic fluid changes over gestation, increasing linearly until 34 to 36 weeks gestation, at which point the AFV levels off (approximately 400mL) and remains constant until term.

The AFV then begins to decrease steadily after 40 weeks gestation, leading to reduced volume in post-term gestations. This pattern allows for clinical assessment of AFV throughout pregnancy using fundal height measurements and ultrasound evaluation. Oligohydraminos is threatening condition to maternal and fetal health. It is clinical condition characterized by amniotic fluid index < 5cm by sonographic assessment.

The amniotic fluid volume (AFV) is regulated by several systems, including the in-tramembranous pathway, fetal production (fetal urine and lung fluid) fetal urination is the main source of amniotic fluid production and another important source is lung secretion.

Amniotic fluid is primarily produced by fetal urine in later half of pregnancy, therefore in absence or reduction of fetal urine production or blockage in urinary tract can result in oligohydramnios . However rupture of membranes is most common cause of oligohydramnios. decline in amniotic fluid influences 1-5 % of term pregnancies.

## **II. Materials and Methods:**

This is was a hospital based observational study conducted on 100 pregnant women who came with complaints of oligohydramnios and its mode of delivery. The study has been approved by the Institutional Ethics Committee. After explaining the purpose of study in vernacular language , those who agreed and consented to take part in study were included. The patients identity and details were kept confidential.

### **Inclusion Criteria:**

- After written informed consent
- AFI more than 5
- Single live intrauterine gestation

### **Exclusion Criteria:**

- Non consenting patients
- AFI more than 5
- Multiple live intrauterine gestation

The study was done at our tertiary care centre in the department of department of Obstetrics and Gynaecology all oligohydromnios patients with AFL <5 at outpatient and/or indoor department attending OPD/IPD of Tertiary care Hospital after due permission from the Institutional Ethics Committee and Review Board and after taking Written Informed Consent from the patients.

Women who fulfill the inclusion and exclusion criteria were included in the study after explaining to them study objectives and after obtaining valid informed consent and also after obtaining approval from IEC and due permission from the concerned heads of units in the department of Obstetrics and Gynecology.

A detailed history and examination was done.

All the required investigations done were education, history of presenting complain, obstetric history, history, family history, clinical signs like pallor, pedal edema, etc., per-abdomen examination findings (Lie, Presentation, Head position, Effacement, etc.), details of delivery (type of labour, Mode of Delivery, Indications for LSCS, etc.), NICU admission, fetal mortality, etc.

All the pregnant women in the study who went into spontaneous labor were allowed to deliver irrespective of gestational age with continuous fetal heart rate monitoring. Caesarean delivery or instrumental vaginal delivery were performed in these women for non-reassuring fetal heart pattern during labor. Women not in labor with the gestational age between 34-37 weeks were closely monitored.

Oligohydramnios was confirmed by measuring AFI.

Routine management in form of rest, left lateral position. USG at the time of admission was recorded including fetal biometry, amniotic fluid volume. Decision of delivery by either induction or elective or emergency LSCS was done as per requirements.

Outcome was noted in the form of

- 1) Perinatal outcome -• APGAR Score • NICU admission • fetal birth weight
- 2) Mode of delivery-The outcome measures recorded were labor, gestational age at delivery, amniotic fluid index (AFI), mode of delivery, indication for cesarean section, instrumental delivery, APGAR score at 1 minute and 5 minutes, birth weight.

**STATISTICAL ANALYSIS:** Quantitative data was presented with the help of Mean and Standard deviation. Comparison among the study group was done with the help of unpaired 't' test as per results of normalcy test. Qualitative data was presented with the help of frequency and percentage table. Association among the study groups is assessed with the help of Fisher's test, Student 't' test and Chi square test. 'p' value less than 0.05 is taken significant.

The Chi square statistic was used for testing relationships on categorical variables. Student t-test was used to compare the means of a normally distributed interval dependent variable for two independent groups. The Fisher's exact test was used when we wanted to conduct a Chi-square test, but one or more of cells had an expected frequency of five or less.

Results were graphically represented where deemed necessary.

Appropriate statistical software, including but not restricted to MS-Excel. SPSS version 20 was used for statistical analysis. Graphical representation was done in MS-Excel 2010.

**III. Result :**

**Distribution of patients according to Gestational Age:**

Majority of the patients (66%) were at 37-40 weeks of gestational age followed by 41-42 weeks (13.4%), 32-36 weeks (11.3%) and >42 weeks (9.3%).

**Table 1: Distribution according to Gestational Age**

Incidence of PIH	N	%
Mild PIH	60	76.9%
Severe PIH	18	23.1%
<b>Total</b>	<b>78</b>	<b>100%</b>

**Distribution of patients according to Incidence of Pregnancy Induced Hypertension (PIH) :** 78 patients had pregnancy induced hypertension (PIH) of which 60(76.9%) patients had mild PIH and 18(23,1%) had severe PIH.

**Table 2: Distribution of patients according to Incidence of PIH**

Gestational Age	N	%
32-36 weeks	17	11.3%
37-40 weeks	99	66%
41-42 weeks	20	13.4%
>42 weeks	14	9.3%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Distribution of patients according to Induction of Labour :**

60 (40%) patients underwent induction of labour

**Table 3: Distribution of patients according Induction of Labour**

Induction of Labour	N	%
Yes	60	40%
No	90	60%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Distribution of patients according to Mode of Delivery**

The mode of delivery was vaginal in 58 (38.7%) patients and Lower Segment Caesarean Section (LSCS) in 92 (61.3%) patients.

**Table 4: Distribution of patients according to Mode of Delivery**

Mode of Delivery	N	%
Vaginal	58	38.7%
LSCS	92	61.3%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Distribution of neonates according to Birth Weight :**

The birth weight of 19 (12.7%) neonates was <2 kgs while it was in the range of 2-2.5 kgs and >2.5 kgs for 83 (55.3%) and 48 (32%) neonates respectively

**Table 5: Distribution according to Birth weight**

Birth Weight	N	%
<2 kgs	19	12.7%
2-2.5 kgs	83	55.3%
>2.5 kgs	48	32%
<b>Total</b>	<b>150</b>	<b>100</b>

**Distribution of neonates according to APGAR Score :**

The APGAR score at 1 minute was <7 and ≥7 for 93 (62%) and 57 (38%) neonates respectively while the APGAR score at 5 minutes was <7 and ≥7 for 86 (57.3%) and 64 (42.7%) neonates respectively

**Table 6: Distribution of neonates according to APGAR**

APGAR Score	N		%
<b>1 Minute</b>	<7	93	62%
	≥7	57	38%
<b>Total</b>		150	100%
<b>5 Minutes</b>	<7	86	57.3%
	≥7	64	42.7%
<b>Total</b>		150	100%

**Distribution of patients according to Indication of LSCS (n=92) :**

The most common indication of LSCS was Previous LSCS with impending scar dehiscence (18.4%) followed by Oligo with Doppler changes (16.3%), Foetal distress (11.9%), Severe oligohydramnios (10.9%), Oligo with MSL (9.8%), CPD in labour (6.62%), Primi breech in labour (4.4%), Failure of induction (4.4%), Cord Prolapse (4.4%), Severe preeclampsia (2.2%), Previous LSCS with PROM (2.2%), IUFD with Oblique lie (2.2%), Gestational hypertension (2.2%), Cord presentation (2.2%) and Breech (2.2%)

**Table 7: Distribution of patients according to Indication of LSCS (n=92)**

Indication of LSCS	N	%
Previous LSCS with impending scar dehiscence	17	18.4%
Oligo with Doppler changes	15	16.3%
Foetal distress	11	11.9%
Severe oligohydramnios	10	10.9%
Oligo with MSL	9	9.8%
CPD in labour	6	6.6%
Primi breech in labour	4	4.4%
Failure of induction	4	4.4%
Cord Prolapse	4	4.4%
Severe preeclampsia	2	2.2%
Previous LSCS with PROM	2	2.2%
IUFD with oblique lie	2	2.2%
Cord presentation	2	2.2%
Gestational hypertension	2	2.2%
Breech	2	2.2%
<b>Total</b>	92	100%

**Distribution of neonates according to NICU Admission:**

84 (56%) neonates were admitted in NICU. 31 (20.7%) and 20 (13.3%) neonates were admitted in NICU due to term low birth weight and fetal distress respectively while 17 (11.3%) and 16 (10.7%) neonates were admitted in NICU due to preterm low birth weight and meconium-stained liquor respectively.

**Table 8: Distribution of neonates according to NICU Admission**

NICU Admission		N	%
<b>Yes (n=84)</b>	<b>Term low birth weight</b>	31	20.7%
	<b>Fetal distress</b>	20	13.3%
	<b>Preterm low birth weight</b>	17	11.3%
	<b>Meconium-Stained Liquor</b>	16	10.7%
<b>No</b>		66	44%
<b>Total</b>		150	100%

**Distribution of neonates according to Perinatal Morbidity :**

13 (8.7%) neonates had meconium aspiration syndrome (MAS) and 4 (2.7%) neonates had congenital malformation. There were 7 (4.7%) cases of still birth.

**Table 9: Distribution of neonates according to Perinatal Morbidity**

Perinatal Morbidity	N	%
Meconium Aspiration Syndrome	13	8.7%
Congenital malformation	4	2.7%
Still birth	7	4.7%

**Distribution of neonates according to Perinatal Mortality :**

There were 8 (5.3%) neonatal death and 7 (4.7%) stillbirth in our study.

**Table 10: Distribution of neonates according to Perinatal Mortality**

Perinatal Mortality	N	%
Neonatal death	8	5.3%
Still birth	7	4.7%
No	135	90%
<b>Total</b>	<b>150</b>	<b>100%</b>

**IV. Discussion :**

A hospital based observational study was conducted with 150 patients to evaluate clinical study of oligohydramnios on mode of delivery in antenatal patients attending tertiary care centre. It was observed in our study that majority of the patients (66%) were at 37-40 weeks of gestational age followed by 41-42 weeks (13.4%), 32-36 weeks (11.3%) and >42 weeks (9.3%). This is comparable to the studies of Patil SV et al95 and Figueroa L et al90. Patil SV et al95 study assessing pregnancies with Oligohydramnios [(amniotic fluid index) AFI≤5cm] at or beyond 34 weeks found mean gestational age was 38.1 weeks and out of the 50 cases of oligohydramnios (AFI≤5) at or beyond 34 weeks of gestation and 50 were 50 normal liquor (AFI≥5 and ≤25) and matched for age, parity and gestational age. Age and gestational ages were not significant between cases and controls. Amniotic fluid index (AFI) was significantly decreased in cases (3.74±1.2) compared (12.54±2.5) with controls. It was observed in our study that majority of the patients Patil SV et al95 study assessing pregnancies with Oligohydramnios [(amniotic fluid index) AFI≤5cm] at or beyond 34 weeks found mean gestational age was 38.1 weeks and out of the 50 cases of oligohydramnios (AFI≤5) at or beyond 34 weeks of gestation and 50 were 50 normal liquor (AFI≥5 and ≤25) and matched for age, parity and gestational age. Age and gestational ages were not significant between cases and controls. Amniotic fluid index (AFI) was significantly decreased in cases (3.74±1.2) compared (12.54±2.5) with controls. In the present study, 78 patients had pregnancy induced hypertension (PIH) of which 60 (76.9%) patients had mild PIH and 18 (23.1%) patients had severe PIH. PIH can be attributed to be one of the aetiological factors for oligohydramnios. This is concordant to the studies of Madhavi K et al96, Figueroa L et al90, Jagatia K et al89 and Ganesh K et al97.

Madhavi K et al96 prospective hospital-based study found incidence of PIH was high (52%) in the study group.

Figueroa L et al90 prospective study showed hypertensive disorders were more common in women with oligohydramnios, 4.6% compared to 2.2%.

Jagatia K et al89 study found most common cause of Oligohydramnios was idiopathic (52%) and second commonest cause was PIH (25%).

Ganesh K et al97 study found significant association of PIH with oligohydramnios. 73

In our study, 60 (40%) patients underwent induction of labour. al89 and Madhavi K et al96.

Patil SV et al95 study showed Induction of Labour was Because of the fear of poor pregnancy outcome if the women with Oligohydramnios remained undelivered, there is increased incidence of induction of labor in the Oligohydramnios group. Similar findings were observed by Patil SV et al95, Jagatia K et LSCS for fetal distress for 36%, 8% for IUGR, 12% for other inductions like 4% breech presentation, 4% for CPD, 2% for persistent occipito posterior, 2% for women with two previous LSCS.

Jagatia K et al89 study observed 25 patients had induction of labour. Out of them cerviprim was used in 18 and misoprost in 4 and oxytocin in 3 patients.

Madhavi K et al96 prospective hospital-based study showed induction of labour was significantly high in study group (48%).

It was observed in the present study that the mode of delivery was vaginal in 58 (38.7%) patients and Lower Segment Caesarean Section (LSCS) in 92 (61.3%) patients. There is increased incidence of caesarean delivery in Oligohydramnios. This increased incidence is due to increased induction of labor leading to fetal distress. This finding was like the studies of Jagatia K et al89 and Madhavi K et al96.

Jagatia K et al89 study observed 64% had vaginal delivery and 36% caesarean section. The observed rate of caesarean was highest in 26-30 years and lowest in patients of >39 years of age.

74 In our study, 60 (40%) patients underwent induction of labour. Because of the fear of poor pregnancy outcome if the women with Oligohydramnios remained undelivered, there is increased incidence of induction of labor in the Oligohydramnios group. Similar findings were observed by Patil SV et al95, Jagatia K et al89 and Madhavi K et al96.

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Jagatia K et al<sup>89</sup> study observed 64% had vaginal delivery and 36% caesarean section. The observed rate of caesarean was highest in 26-30 years and lowest in patients of >39 years of age.

Madhavi K et al<sup>96</sup> prospective hospital-based study found incidence of caesarean section rate (75%), spontaneous onset of labour pains the incidence of instrumental delivery (13 %) and caesarean section rates (42%).

The most common indication of LSCS in the present study was Previous LSCS with impending scar dehiscence (18.4%) followed by Oligo with Doppler changes (16.3%), Foetal distress (11.9%), Severe oligohydramnios (10.9%), Oligo with MSL (9.8%), CPD in labour (6.62%), Primi breech in labour (4.4%), Failure of induction (4.4%), Cord Prolapse (4.4%), Severe preeclampsia (2.2%), Previous LSCS with PROM (2.2%), IUFD with Oblique lie (2.2%), Gestational hypertension (2.2%), Cord presentation (2.2%) and Breech (2.2%). Similar observations were noted in the studies of Jagatia K et al<sup>89</sup>, Madhavi K et al<sup>96</sup> and Patil SV et al<sup>95</sup>.

Jagatia K et al<sup>89</sup> study observed most common reason to perform caesarean was fetal distress which was either due to cord compression or IUGR.

Madhavi K et al<sup>96</sup> prospective hospital-based study observed indications for caesarean section fetal distress was dominant indication in study group (40%) when compared to control (10%) with significant difference and other indications for caesarean sections were PIH, cephalo-pelvic disproportion and failed induction.

Patil SV et al<sup>95</sup> study observed in cases of induced labor in 14 (28%) and spontaneous labor in 36 (72%). In cases, full term normal vaginal delivery was in 15 (30%), PVD in 6 (12%), LSCS in 28 (56%) and instrumental vaginal delivery in 1 (2%). In controls, full term normal vaginal delivery was in 41 (82%), PVD in 5 (10%), LSCS in 4 (8%) and instrumental vaginal delivery nil. 56% of women underwent caesarean delivery. LSCS for fetal distress was done for 36%, 8% for IUGR, 12% for other inductions like 4% breech presentation, 4% for CPD, 2% for persistent occipito posterior, 2% for women with two previous LSCS.

It was observed in our study that the birth weight of 19 (12.7%) neonates was <2 kgs while it was in the range of 2-2.5 kgs and >2.5 kgs for 83 (55.3%) and 48 (32%) neonates respectively. Birth weights were significantly less in newborns with Oligohydramnios. The incidence of low-birth-weight babies is higher in Oligohydramnios except in post maturity where the babies may have average birth weight. This is similar to the studies of Patil SV et al<sup>95</sup>, Madhavi K et al<sup>96</sup> and Figueroa L et al<sup>90</sup>.

Patil SV et al<sup>95</sup> study showed found birth weight is <2.5 kgs was in 31 (62%) and >2.5 was in 19 (38%) and in controls, < 2.5 kgs was in 12 (24%) and >2.5 kgs was in 38 (76%).

Madhavi K et al<sup>96</sup> prospective hospital-based study showed incidence of low birth weight babies was as high as 56% and mean birth weight in the study group was 2.4kg.

Figueroa L et al<sup>90</sup> prospective study showed mean birth weight was significantly lower in the oligohydramnios group with a mean difference of - 162.3 g.

In the present study, the APGAR score at 1 minute was <7 and ≥7 for 93 (62%) and 57 (38%) neonates respectively while the APGAR score at 5 minutes was <7 and ≥7 for 86 (57.3%) and 64 (42.7%) neonates respectively. This is comparable to the studies of Patil SV et al<sup>95</sup> and Madhavi K et al<sup>96</sup>.

Patil SV et al<sup>95</sup> study showed APGAR score measured <7 at 1 minute was in 19 (38%) and at 5 minutes was in 5 (10%) in cases and in controls APGAR score at 1 minute was in 13 (26%) and at 5 minutes was in 2 (4%).

Madhavi K et al<sup>96</sup> prospective hospital-based study observed APGAR scores at 5 minutes between the study and control groups were 20 % of the cases in study group had APGAR less than 7 compared to 4% of cases in control group.

In our study, 84 (56%) neonates were admitted in NICU. 31 (20.7%) and 20 (13.3%) neonates were admitted in NICU due to term low birth weight and fetal distress respectively while 17 (11.3%) and 16 (10.7%) neonates were admitted in NICU due to preterm low birth weight and meconium-stained liquor respectively. Jagatia K et al<sup>89</sup>, Madhavi K et al<sup>96</sup> and Vyas A et al<sup>93</sup> noted similar observations in their studies.

Jagatia K et al<sup>89</sup> study stated Oligohydramnios was related to higher rate of growth retardation and NICU admission.

Madhavi K et al<sup>96</sup> prospective hospital-based study showed incidence of NICU admission in study group (34%) when compared to 8% in control group. Vyas A et al<sup>93</sup> observational prospective study reported borderline AFI group had a higher rate of perinatal complications such as Apgar score of <7, respiratory distress syndrome, neonatal intensive care unit admission, intrauterine growth restriction, and low birth weight.

It was observed in the present study that 13 (8.7%) neonates had meconium aspiration syndrome (MAS) and 4 (2.7%) neonates had congenital malformation. There were 7 (4.7%) cases of still birth. This is concordant to the studies of Chauhan SP et al98, Patil SV et al95 and Madhavi K et al96.

Chauhan SP et al98 reported clear association between oligohydramnios and increased incidence of meconium aspiration syndrome as well as NICU admissions.

Patil SV et al95 study showed IUGR was reported in 9 (18%) in cases and 1 (2%) in controls.

Madhavi K et al96 prospective hospital-based study found incidence of meconium aspiration syndrome (MAS) was 6% in study group while nil in control group.

There were 8 (5.3%) neonatal death and 7 (4.7%) still birth in our study. Similar finding was observed by Figueroa L et al90.

Figueroa L et al90 prospective study reported women with oligohydramnios compared to those without had higher risk for stillbirths (80.5 per 1000 births vs. 14.9 per 1000 births), neonatal deaths within 28 days (75.0 vs 16.7 per 1000 live births), low birth weight (29.9% vs 11.7%) and preterm birth (31.8% vs 11.4%). Congenital anomalies were more common among the offspring of women with oligohydramnios compared to without oligohydramnios (2.6% vs. 0.1%, respectively).

Vyas A et al93 observational prospective study reported borderline AFI group had a higher rate of perinatal complications such as Apgar score of <7, respiratory distress syndrome, neonatal intensive care unit admission, intrauterine growth restriction, and low birth weight.

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## **V. Conclusion :**

Oligohydramnios is frequent occurrence and demands intensive fetal surveillance and proper antepartum and intrapartum care.

Proper antenatal care with emphasis on clinical and ultrasonographic assessment of liquor preventing antenatal complications like pregnancy induced hypertension, post term pregnancies can probably reduce the incidence of oligohydramnios. Early intervention in the form of induction of labour, close intrapartum monitoring, artificial rupture of membranes in active phase of labour and grading of liquor and early decision-making regarding mode of delivery are the steps to be taken to prevent poor perinatal outcome.

Decision between vaginal delivery and caesarean section should be well balanced so that unnecessary maternal morbidity can be prevented and timely intervention can reduce perinatal morbidity and mortality.

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