



## Maternal & Fetal Outcome after Diagnosis of Oligohydramnios at Term

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### Abstract

**Objectives:** *The aim of the study was to evaluate the effects of oligohydramnios on maternal and fetal outcome at term pregnancy.*

**Methodology:** *A case control study on pregnancy outcome in 100 women with AFI <5cm after 37 completed weeks of pregnancy compared with 100 controls with no oligohydramnios with matched age and parity.*

**Results:** *Non stress test (NST) was non-reactive in 40% of oligohydramnios and 20% of controls and was statistically significant ( $P < 0.05$ ). Ominous fetal heart patterns were seen in 60% of oligohydramnios and 30% of controls but it was statistically not significant. Thick meconium stained amniotic fluid was seen in 50% of oligohydramnios and 20% of the controls and was significant ( $P < 0.001$ ). In oligohydramnios, 54% were induced whereas in controls, only 24% and was significant ( $P < 0.002$ ). For fetal distress, 88% of oligohydramnios and 90% of controls underwent LSCS and was not significant. APGAR score <7 was insignificant between the two groups. LBW and NICU admission were more in oligohydramnios and was significant ( $P < 0.05$ ,  $< 0.01$ ). Perinatal mortality was not significant between the two groups.*

**Conclusion:** *Oligohydramnios (AFI <5) is valuable for predicting fetal distress in labour requiring caesarean section, used as an adjunct to other fetal surveillance methods. Oligohydramnios (AFI <5 cm) detected after 37 weeks of gestation is an indicator of poor pregnancy outcome.*

**Keywords:** *AFI, oligohydramnios, LBW.*

### Introduction

Nature has made of amniotic fluid cavity filled with liquor amnii, as floating bed for the fetus, for its growth in sterile environment, regulation of temperature, avoidance of external injury and reduction of impact of uterine contractions. Amniotic fluid Index (AFI) by four quadrant technique via transabdominal ultrasonography (USG), better identifies fetus at high risk than clinical estimation of amniotic fluid<sup>1</sup>.

Amniotic fluid index (AFI) of  $\leq 5$  cm is oligohydramnios as, described by Phelan et al<sup>2</sup>. It has been correlated with increased risk of

intrauterine growth retardation, meconium aspiration syndrome, severe birth asphyxia, low APGAR scores and congenital abnormalities<sup>1,2</sup>. Oligohydramnios is also associated with maternal morbidity in form of increased rates of induction and/or operative interference<sup>3</sup>. Increased induction of labor and elective caesarean deliveries are currently practiced for better perinatal outcome. The etiology, management and the outcome is different in late onset oligohydramnios compared to early onset oligohydramnios. Studies show that amniotic fluid index is a poor predictor of adverse outcome<sup>3</sup>. Thus this study is conducted to find out

the value of oligohydramnios in perinatal outcome and maternal outcome in pregnancies beyond 37 completed weeks.

### Materials and Methods

After approval of Institutional Ethical Committee, proper counseling and consent of patients, study was conducted from May 2016 onwards in Department of OBG, GMC, Bettiah. Hundred (100) number of consecutive patients with diagnosis of oligohydramnios (with AFI  $\leq$  5 cm) by ultrasound after 37 completed weeks selected after satisfying inclusion and exclusion criteria and compared with 100 controls without oligohydramnios and matched for other variables like age, parity, gestational age and any pregnancy complication. Inclusion Criteria- 1) Singleton pregnancy with cephalic presentation, 2) pregnancies after 37 completed weeks of gestation, 3) AFI < 5 cm. The amniotic fluid volume is considered normal if amniotic fluid index is between 5.1 and 20 cm. All cases were monitored by continuous electronic fetal monitoring in labor. Those who developed significant variable decelerations and repetitive late decelerations or other ominous FHR pattern with or without meconium stained liquor which persisted inspite of corrective measures like change in maternal position, hydration, O<sub>2</sub> inhalation and stopping oxytocin were delivered by LSCS or forceps delivery. After 3 cm dilatation of the cervical os in primigravida and 4 cm dilatation in multigravida artificial rupture of membranes was done. Cases with thick meconium stained liquor was taken for emergency LSCS. Study was conducted to observe outcome of labour in form of spontaneous or induced labour, modes of delivery and perinatal outcome like fetal distress, APGAR scores of newborn, birth weight, NICU admission and neonatal mortality. Data were collected in structured proforma and analysis was done with suitable statistical tools. Frequency distribution and chi-square tests were applied to analyse the data. P value of less than 0.05 was taken as statistically significant.

### Results

The mean age for study group was 21.5 years and that of control group was 20.5 years. The mean gravidity was 2 and 1.8 and mean parity was 0.8 and 0.8 respectively for cases and controls. The mean gestational age was 39 weeks for study group and 39.4 weeks for control group which was similar. Idiopathic (58%) was the most common cause of oligohydramnios. PIH (35%) and post term (10%) pregnancy were other causes of oligohydramnios. The mean AFI for study group was 3.55cm and control group was 9.55cm [table 1].

**Table 1: Distribution of Amniotic Fluid Index (AFI)**

AFI in cm	Number
<b>Study group</b>	
<2	4
2-3	30
3.1-4	26
4.1-5	40
Total	100
<b>Control group</b>	
5-8	38
8.1-11	26
11.1-14	28
14.1-17	8
Total	100

Oligohydramnios is associated with more number of non-reactive NST (40%) as compared to controls (20%). There was statistically significant difference between the two groups in the occurrence of non-reactive and reactive NST ( $p < 0.05$ ) (table 2). Most common FHR abnormality included variable deceleration which was considered significant if it was in oligohydramnios. In the control group 18(18%) women developed variable decelerations and 12(12%) women had late deceleration. However, these ominous FHR were seen in those women of control group who had an AFI in the lower range. There was no significant difference in two groups in occurrence of FHR decelerations statistically ( $P = 0.66$ ) [table 2].

**Table 2: Distribution of Non-stress test, Variable fetal heart rate pattern and Nature of amniotic Fluid in oligohydramnios and controls**

Category	Study group		Control group		P-Value
	No	%	No	%	
<b>Non Stress Test</b>					
Reactive	60	62	80	80	P<0.05
Non reactive	40	38	20	20	
<b>Abnormal fetal heart rate patterns</b>					
Variable deceleration	40	40	18	18	P=0.66
Late deceleration	20	20	12	12	
Total	60	60	30	30	
<b>Nature of amniotic fluid</b>					
Clear	38	38	74	74	P<0.001
Thin meconium	12	12	6	6	
Thick meconium	50	50	20	20	
Total	100	100	100	100	

Oligohydramnios is associated with more number of women (48 %) with thick meconium stained amniotic fluid. The difference in occurrence of meconium stained amniotic fluid between two groups was statistically significant (P<0.001) [table 2]. The labour was induced in 54 (54%) women with oligohydramnios and 24 (24%) of controls. The decision for induction or allowing for spontaneous labour was made depending upon AFI, gestational age, presence of complications like preeclampsia, post term pregnancy, non reactive NST and favorability of cervix. The difference between two groups in this category was statistically significant (P<0.001) [table 2]. LSCS was done in 48 and forceps delivery in 12 cases of oligohydramnios. A total of 50 (50%) women developed fetal distress in oligohydramnios. Among 50 women of fetal distress, 44 (88%) of them were delivered by caesarean section; 6 (12%) by forceps delivery. In controls 20 (20%) developed fetal distress. Among the 20 cases of fetal distress, 18 (90%) were delivered by caesarean section and 2 (10%) by forceps delivery. The difference was statistically non significant (P=0.98) [table 3].

**Table 3: Distribution of oligohydramnios and mode of termination, mode of delivery and interventions for fetal distress**

Category	Study group		Control group		P-Value
	No	%	No	%	
<b>Mode of Termination</b>					
Induced	54	54	24	24	P<0.002
Spontaneous	46	46	76	76	
Total	100	100	100	100	
<b>Modes of delivery</b>					
Normal vaginal delivery	40	40	72	72	P=0.98
LSCS	48	48	22	22	
Forceps delivery	12	12	6	6	
Total	100	100	100	100	
<b>Interventions for fetal distress</b>					
LSCS Deliveries	44	44	18	18	P=0.98
Instrumental Deliveries	6	6	2	2	
Total interventions	50	50	20	20	

The determination of AFI < 5 cm as a screening test in predicting fetal distress during labor requiring caesarian delivery has a sensitivity of 72%, specificity of 60%, positive predictive value of 45% and negative predictive value of 82.5%. A better sensitivity and negative predictive value makes it a good screening test. The occurrence of cesarean section rate was high in oligohydramnios group when associated with non reactive NST (52.5%). Even when the NST was reactive in oligohydramnios 38.7% had LSCS (table 4).

**Table 4 : LSCS for fetal distress in Non-reactive & Reactive NST**

Groups	Non-reactive NST	LSCS for fetal distress	Percentage
Oligohydramnios	40	20	52.51%
Controls	20	8	40.00%
Groups	Reactive NST	LSCS for fetal distress	Percentage
Oligohydramnios	60	24	40.00%
Controls	80	10	12.50%

The mean APGAR score in cases of oligohydramnios was 6.9 at 1 minute, 8.02 at 5

minutes. In controls, it was 7.8 at 1 minute and 9.2 at 5 minutes. The mean APGAR score and difference in the occurrence of APGAR score <7 was statistically not significant (P=0.9) [table 5].

**Table 5: Perinatal Outcome in Oligohydramnios and Controls**

Category	Study group		Control group		P-Value
	No	%	No	%	
<b>APGAR Score &lt;7</b>					
1 minute	32	32	18	18	0.9
5 minutes	16	16	6	6	
<b>Birth weight</b>					
1.5 – 2 kg	12	12	0	0	<0.05
2.1 – 2.5 kg	52	52	28	28	
2.6 – 3 kg	22	22	48	48	
3.1 – 3.5 kg	10	10	24	24	
>3.5 kg	4	4	0	0	
Total	100	100	100	100	
<b>NICU admission</b>					
NICU admission	40	40	12	12	<0.01
<b>Neonatal mortality</b>					
Neonatal death	8	8	2	2	0.61

The mean birth weight was 2.3 kg in oligohydramnios and 2.64 kg in control group. The difference in mean birth weight was not statistically significant. But, babies with birth weight <2.5kg were seen in 64% of oligohydramnios cases, whereas in controls, it was only 28%.The occurrence of low birth weight (<2.5kg) was statistically significant (p<0.05). In oligohydramnios, 20 babies (20%) were admitted to NICU for various morbidities like, birth asphyxia, neonatal seizures and meconium aspiration syndrome, whereas in controls, only 12% admitted. The difference in the two groups was statistically significant (p<0.01). Difference in the neonatal deaths was nonsignificant between two groups (p=0.61) [table 5].

## Discussion

Various outcomes like age, parity, gestational age in our study are comparable with other Indian and Western studies<sup>3,4,5</sup>. The non-reactive NST rates are high in women with oligohydramnios. The rate of nonreactive NST is 38% in our study and is

comparable to Meena Khatri et al<sup>4</sup> and Krishna Jagatia et al<sup>5</sup>, who reported non-reactive NST rates to be 38% and 32% respectively. Abnormal fetal heart rate in the form of variable and late decelerations during the intrapartum period indicates fetal distress and common in oligohydramnios. The variable and late decelerations FHR patterns noted in 60% in our study is more compared to 48% and 8% in studies by Casey et al<sup>6</sup> and Sangeetha et al<sup>7</sup> respectively. The meconium stained amniotic fluid is high in women with oligohydramnios. In our study thick meconium stained liquor was noted in 48% and is comparable to Preshit Chate et al<sup>4</sup> who reported 46% of patient with grade III meconium stained amniotic fluid. Whereas, Sangeetha et al<sup>7</sup> reported thick meconium stained amniotic fluid in only 18% of oligohydramnios cases. Rates of LSCS for fetal distress in oligohydramnios vary in different studies. In our study, it was 88% and is more compared to Bhat S et al<sup>8</sup> and Madhavi et al<sup>9</sup> who reported 68% and 70% respectively. The efficacy of oligohydramnios in predicting fetal distress and requirement of LSCS had a sensitivity of 72% and specificity of 60%, positive predictive value of 45% and negative predictive value of 82.5%. In this study, a better sensitivity and negative predictive value makes it a good screening test. Sangeetha et al<sup>7</sup> also concluded that it can be considered as a good screening test for the appearance of fetal distress in the intrapartum period requiring a cesarean delivery. The rate of LSCS was more with those with oligohydramnios and nonreactive NST (52%). Even with reactive NST, 38% developed fetal distress and LSCS was done, and is comparable to Krishna Jagatia et al<sup>5</sup> and Sangeetha et al<sup>7</sup>. The 5 minute APGAR Score <7 is seen in 16% of oligohydramnios group. This is in full agreement with studies by Vidyadhar B Bangal et al<sup>10</sup> (16%), Bhat S et al<sup>8</sup> and Krishna Jagatia et al<sup>5</sup> (15%) and Madhavi et al<sup>9</sup> (20%). Newborns were admitted in the neonatal ward for various morbidities like birth asphyxia, meconium aspiration, etc in 40% of our cases is comparable to Preshit Chate et al of 42%. But in studies by

Bhat S et al<sup>8</sup> and Krishna Jagatia et al<sup>5</sup> NICU admission was comparatively less 28% and 22% respectively. Neonatal death in this study was 8%. Whereas Krishna Jagatia et al<sup>5</sup> reported 4%, Chate et al<sup>4</sup> reported 2% and Vidyadhar B Bangal et al<sup>10</sup> reported higher percent of 24%.

### Conclusion

Oligohydramnios detected after 37 completed weeks of pregnancy is an indicator of poor pregnancy outcome. Non-reactive NST, intrapartum abnormal FHR tracing, thick meconium stained liquor, development of fetal distress, the rate of LSCS, low 5 minute APGAR score, low birth weight and perinatal mortality are high in cases of oligohydramnios.

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### References

1. Umber A. Perinatal Outcome in Pregnancies Complicated by Isolated Oligohydramnios at Term. *Annals*. 2009; 15: 35-7.
2. Phelan JP, Smith CV, Broussard P, Small M. Amniotic fluid volume assessment using the four-quadrant technique in the pregnancy at 36-42 weeks gestation. *J Reprod Med*. 1987; 32(7): 540-2.
3. Sultana S, Akbar Khan MN, Khanum Akhtar KA, Aslam M. Low amniotic fluid index in high-risk pregnancy and poor apgar score at birth. *J Coll Physicians Surg Pak*. 2008; 18(10): 630-4.
4. Chate P, Khatri M, Hariharan C. Pregnancy outcome after diagnosis of oligohydramnios at term. *Int J Reprod Contracept Obstet Gynecol*. 2013; 2(1): 23-6.
5. Jagatia K, Singh N, Patel S. Maternal and fetal outcome in Oligohydramnios: A Study of 100 Cases. *International Journal of Medical Science and Public Health*. 2013; 2(3): 724-27.
6. Casey BM, McIntire DD, Bloom SL, Lucas MJ, Santos R, et al. Pregnancy outcome after antepartum diagnosis of oligohydramnios at or beyond 34 weeks of gestation. *Am J Obstet Gynecol*. 2000; 182(4): 909-12.
7. Sangeetha K, Rao J, Ashwini AP, Kumar A. Pregnancy Outcome in Amniotic Fluid Index Less than 5 in Term Low-Risk Pregnancy. *International Journal of Scientific Study*. 2015; 3(3): 69-73.
8. Bhat S, Kulkarni V. Study of effect of Oligohydramnios on Maternal and Fetal Outcome. *International Journal of Medical and Dental Sciences*. *IJMDS*. 2015; 4(1): 582-88.
9. Madhavi K, Rao C. Clinical Study of Oligohydramnios, Mode of Delivery and Perinatal Outcome. *IOSR Journal of Dental and Medical Sciences*. 2015; 14(4): 6-11.
10. Shiva Kumar HC Hiriyyur Chidandaiah, Chandrashekhar K, Suman Gaddi : Pregnancy outcome after diagnosis of oligohydramnios at term, *The New Indian Journal of OBGYN*. 2017; 4(1):37-41.