

## PREGNANCY OUTCOME FOLLOWING INDUCTION OF LABOUR IN OLIGOHYDRAMNIOS AND BORDERLINE LIQUOR AT TERM: A COMPARATIVE STUDY

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**ABSTRACT: OBJECTIVE:** The purpose of this study was to compare the feto-maternal outcome after induction of labor in oligohydramnios and borderline liquor at term. **STUDY DESIGN:** This retrospective study was conducted in a medical college and general hospital with women of 37–42 weeks' gestation. The amniotic fluid index (AFI) was determined in all cases using the four-quadrant technique. The cases were divided into two groups based on their AFI. Oligohydramnios group (n=102) with AFI  $\leq$  5 cm and borderline liquor group (n=99) with AFI of 5.1 to 8 cm. Induction of labor was done by misoprostol in all cases. Different maternal outcomes like mode of delivery, indication for operative or instrumental delivery, meconium stained liquor and perinatal outcomes were compared in between the two groups. **RESULTS:** The two groups were similar with regard to maternal age, parity, and gestational age. Meconium staining of the amniotic fluid was significantly higher in the group with AFI  $<$  5 cm ( $p = 0.05$ ). The number of cesarean deliveries and incidence non-reassuring fetal heart (fetal distress) were similar in both the groups. There was no significant difference between the two groups with regard to Apgar scores or admission to neonatal intensive care unit (NICU). **CONCLUSION:** Induction of labor at term in women with oligohydramnios is associated with an increased incidence of meconium staining of the amniotic fluid but the risk of cesarean delivery or fetal distress it is not increased as compared with borderline liquor.

**KEYWORDS:** Amniotic fluid index; Borderline liquor; Induction of labor; Fetal distress Oligohydramnios at Term.

**INTRODUCTION:** Amniotic fluid has important functions during pregnancy and Labor. During labor it forms a hydrostatic wedge which helps in dilatation of the cervix, prevents marked interference with placental circulation during uterine contractions and flushes the birth canal at the end of first stage of labor. As it possesses certain bacteriostatic properties that protect against potential infectious processes so decrease in amniotic fluid volume may impair the gravid woman's ability to combat such infections.<sup>1</sup> Abnormalities like meconium staining, congenital malformations, growth restriction, dysmaturity and fetal hypoxia has been associated with reduced amniotic fluid volume. Thus, the assessment of amniotic fluid volume is an important part of antenatal fetal surveillance. It is also an important indicator of fetal well-being during labor.

Although there are different methods to quantify amniotic fluid volume, ultrasonography is routinely used for its assessment. Out of different measurements in ultrasonography, amniotic fluid index (AFI) is the commonly used semi quantitative measurement of amniotic fluid.<sup>2</sup> An AFI of 5 cm or less has been used to define oligohydramnios and adverse pregnancy outcome.<sup>2-3</sup> However, not all authors agree on the idea that AFI of 5 cm or lower is associated with an adverse pregnancy outcome.<sup>4-5</sup> Phelan et al originally defined a borderline sonographic estimate of the amniotic fluid

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volume as an AFI of 5.1 to 8cm. <sup>2</sup> Different authors used different cut-off values of AFI to define borderline AFI. <sup>6-8</sup> Two American College of Obstetricians and Gynecologists' practice bulletins have defined an AFI of greater than 5.0 cm as consistent with a normal amniotic fluid volume. <sup>9-10</sup> Whether a borderline AFI is also linked to an adverse pregnancy outcome and should be combined with the group with an AFI of 5 cm or less and managed similarly is uncertain.

There are numerous reported studies in literature comparing the fetomaternal outcome between oligohydramnios and borderline liquor but only limited number of studies compared the outcome after induction of labor. The present study was conducted with the objective to compare the fetomaternal outcome following induction of labor in between oligohydramnios and borderline liquor.

**MATERIAL AND METHODS:** This retrospective study was conducted in a medical college and hospital after taking permission from institutional ethical committee. Data was collected from labor room record for the period of October 2012 to September 2013. Oligohydramnios was defined as AFI  $\leq$  5 cm and AFI of 5.1 to 8 cm was taken as borderline liquor. <sup>2</sup> Pregnant women who had induction of labor at term for oligohydramnios or borderline liquor were included for the study. Singleton pregnancy at term with cephalic presentation and without any obstetrics complications were the inclusion criteria. Cases already in labor, gestational age less than 36 weeks or more than 42 weeks, premature rupture of membrane (PROM) and induction done for other indications were excluded from the study. Data was collected regarding maternal age, gestational age and parity. The method of induction was uniform in all cases by misoprostol. Outcome parameters were mode of delivery, indication for operative or instrumental delivery, birth weight, one minute Apgar score less than 5 and 5 minute Apgar score less than 7, meconium stained liquor, NICU admission, pulmonary hypoplasia and neonatal death.

Collected data was entered in MS Excel spread sheet and statistical analysis was done by EPI info. Parametric data was compared by chi-square test and non-parametric data by students'-test. P value less than 0.05 was taken as significant.

**RESULTS:** Out of total 232 cases only 201 cases were considered for the study as in the remaining 31 cases the value of AFI was not mentioned. There were total 102 cases in oligohydramnios group and 99 cases in borderline liquor group. Table 1 shows the distribution of age, parity and gestational age in between two groups. The differences in mean age was statistically not significant in between two groups ( $p=0.64$ ). Table 2 shows the comparison of mode of delivery in between two groups. Although the rate of LSCS was more in oligohydramnios group it was statistically not significant ( $p=0.1$ ). The indications for cesarean section in between two groups are compared in table 3. Non reassuring fetal heart rate pattern was the indication for cesarean section in majority of cases in both groups. There was no significant difference in the indications of cesarean section in between two groups ( $p=0.15$ ). Different perinatal outcome measures were compared in between two groups in table 4. Low birth weight babies were significantly higher in oligohydramnios group ( $p=0.04$ ). Though there were differences in mean birth weight it was statistically not significant ( $p=0.07$ ). Although more new-borns in oligohydramnios group had low Apgar score, meconium stained liquor, NICU admission, pulmonary hypoplasia and neonatal death, only the incidence meconium stained liquor was significantly higher ( $p=0.05$ ).

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Parameter	Oligohydramnios (AFI≤5 cm) (n=102)	Borderline Liquor (AFI=5.1 to 8 cm) (n=99)	'p' value
<b>Age in years</b>			
< 20 y	05(4.9%)	03(3.03%)	
≥20 to 29 y	87(85.29%)	85(85.85%)	
≥30 y	10(9.8%)	11(11.11%)	
Mean[S.D] age in years	24.63[3.41]	24.86[3.62]	0.64
<b>Parity</b>			
Para <sub>0</sub>	78(76.47%)	77(77.77%)	0.35
Para <sub>1</sub>	18(17.64%)	20(20.2%)	
Para <sub>2</sub> or more	06(5.88%)	02(2.02%)	
<b>Gestational Age in weeks</b>			
37 to 40 weeks	78(76.47%)	81(79.41%)	0.35
40.1 to 42 weeks	24(23.52%)	18(18.18%)	
Table 1: Distribution of subjects by age, parity and gestational age			

Mode of Delivery	Oligohydramnios (AFI≤5 cm) (n=102)	Borderline Liquor (AFI=5.1 to 8 cm) (n=99)	'p' value
Normal Vaginal Delivery	61(59.80%)	68(66.66%)	0.1
LSCS	38(37.25%)	29(28.43%)	
Instrumental Delivery	03(2.94%)	02(2.02%)	
Table 2: Comparison of mode of delivery in between two groups			

Indications	Oligohydramnios (AFI≤5 cm) (n=38)	Borderline Liquor (AFI=5.1 to 8 cm) (n=29)	'p' value
Non Reassuring Fetal Heart	29(76.31%)	24(82.75%)	0.15
Cephalopelvic Disproportion (CPD):			
- Primary	01(2.63%)	01(3.44%)	
- Secondary	02(5.26%)	02(6.89%)	
Failed induction	01(2.63%)	02(6.89%)	
Deep Transverse arrest (DTA)	02(5.26%)	Nil	
Non progress of Labor	02(5.26%)	Nil	
Severe IUGR	01(2.63%)	Nil	
Table 3: Comparison of indications for Cesarean Section in between two groups			

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Mode of Delivery	Oligohydramnios (AFI≤5 cm) (n=102)	Borderline Liquor (AFI=5.1 to 8 cm) (n=99)	‘p’ value
Birth weight: • < 2.5 kg • ≥ 2.5 kg	39(38.23%) 63(61.76%)	27(27.27%) 72(72.72%)	0.04
Mean[SD] Birth in weight in kg	2.61[0.46]	2.72[0.46]	0.07
Apgar score <5(1min) &<7(5min)	03(2.94%)	Nil	
Meconium stained Liquor	23(22.54%)	12(12.12%)	0.05
NICU admission	08(7.84%)	03(3.03%)	0.06
Pulmonary Hypoplasia	01(0.98%)	Nil	
Neonatal Death	02(1.96%)	Nil	
<b>Table 4: Comparison perinatal outcome in between two groups</b>			

**DISCUSSION:** In spite of the controversy regarding the best applicable method of assessing amniotic fluid volume and its usefulness in predicting perinatal outcome, the AFI remains widely used in clinical practice.<sup>11-14</sup> Reduced amniotic fluid in high-risk pregnancies carries an increased risk of intrapartum complications.<sup>15</sup> However, the picture in low risk pregnancies is less clear. Conflicting views are expressed in different studies.<sup>16-17</sup>

In our study, both the groups were comparable in relation to age distribution, mean age, parity and gestational age. Although the percentage of vaginal deliveries were less in oligohydramnios group it was statistically not significant. Different studies showed different rates of cesarean section in pregnant women with amniotic fluid index of <5 cm ranging from 20% to 64%.<sup>18-20</sup> When the rate of cesarean section was compared between AFI <5 cm and AFI ≥5 cm, different studies reported different findings. Desai et al reported that, there was no significant difference in rates of cesarean section and instrumental vaginal delivery in pregnant women with AFI ≤5cm and >5cm.<sup>18</sup> While Haifa et al and Chate et al reported that the overall cesarean section rate was significantly higher in the group with AFI ≤5 cm as compared to AFI > 5 cm.<sup>19-20</sup>

Indications for cesarean section were significantly not different in between the two groups. The commonest indication for cesarean section in both the groups was non reassuring fetal heart rate pattern (fetal distress). Desai et al reported that, there was no significant difference in the indications of cesarean section in between two groups with AFI ≤5 cm and >5 cm but the commonest indication in their study was non progressive labor.<sup>18</sup> The rate of non-reactive fetal heart rate pattern was significantly higher in AFI ≤5 cm group as compared to AFI 5.1 to 20 cm in the study by Chate et al (p=0.04).<sup>20</sup> Haifa et al reported that, more cesarean sections were performed for fetal distress in the group with AFI ≤5 cm as compared to AFI > 5 cm (p < 0.0001).<sup>19</sup>

Although the incidence low birth weight neonates and meconium stained liquor were significantly more in AFI <5 cm group, other neonatal outcome measures were significantly not different in our study. The incidence of a low Apgar score at 1 min and admission to NICU was statistically significant (p = 0.025 and 0.043, respectively) in AFI ≤5 cm group in the study by Hafia et al.<sup>19</sup> Chate et al also reported that the incidence of low birth weight and admission to NICU was

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significantly higher in AFI  $\leq 5$  cm group but there was no significant difference in incidence of neonatal death and Apgar score of  $<7$  at 1 min and 5 min.<sup>20</sup> Kreiser et al found a small but insignificant increase in babies born with low Apgar score at 5 minutes when the AFI was less.<sup>8</sup> But they had neither any perinatal mortality nor admission of these babies in NICU. Both Greenwood et al and Desai et al reported that the incidence of meconium stained liquor was significantly not higher in AFI  $\leq 5$  cm group.<sup>18 & 21</sup> Desai et al also reported that the incidence of cord prolapse was significantly not higher in AFI  $\leq 5$  cm group.<sup>18</sup>

The number of cases in this study was too small to draw any conclusion about pulmonary hypoplasia and neonatal death.

**CONCLUSION:** We conclude that induction of labor with vaginal misoprostol at term in women with AFI  $< 5$  cm is not associated with an increased risk of cesarean section or instrumental vaginal delivery and intrapartum fetal distress but it is associated with increased risk of meconium stained liquor. A larger prospective study is needed to draw more firm conclusions.

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