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Original Research Article

Fetomaternal outcome following labour induction in oligohydramnios and borderline liquor: a retrospective study in a tertiary care hospital

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ABSTRACT

Background: Amniotic fluid provides a protective milieu for the growing fetus in pregnancy and labour. A decrease in the amniotic fluid volume has been associated with increased maternal morbidity and fetal morbidity and mortality. The purpose was to compare the effect of labour induction on the fetomaternal outcome in women with oligohydramnios, borderline liquor and normal liquor at term.

Methods: A retrospective study of all the labour induction in women with oligohydramnios, borderline liquor and normal liquor volume at 37-42 weeks gestation in a tertiary care teaching hospital. The demographic characteristics, maternal outcomes like mode of delivery, indication for operative delivery, meconium stained liquor and perinatal outcomes were compared in between the three groups. Parametric data was compared by chi-square test and non-parametric data by students' t-test. A p-value less than 0.05 was taken as significant.

Results: Among the 2338 deliveries during the study period, labour was induced in 266 women (11.3%). Out of which, 109 cases (40.9%) in oligohydramnios group, 111 cases (41.7%) in borderline liquor group and 46 cases in normal liquor group. The incidence of meconium stained liquor, the number of operative deliveries and fetal distress was significantly higher and significantly lower birth weight (<2.5 kg) in the group with oligohydramnios and borderline liquor ($p < 0.05$). Low Apgar score and admission to neonatal intensive care unit was higher in the oligohydramnios group ($p < 0.05$).

Conclusions: Induction of labour on detecting borderline liquor at term may help in reduction of maternal and fetal morbidity and mortality.

Keywords: Borderline liquor, Fetomaternal outcome, Labour induction, Obstetric outcome, Oligohydramnios

INTRODUCTION

Amniotic fluid provides a protective milieu for the growing fetus during pregnancy and labour. Amniotic fluid volume is a biophysical profile parameter with particular significance, as it provides valuable information about fetal well-being and decision for induction of labor. One of the etiologies for diminished amniotic fluid is due to chronic hypoxia since it results from diminished fetal urine output. This is secondary to compensatory redistribution of fetal circulation. The reported incidence of oligohydramnios (AFI <5), accounts for 0.5% and that of borderline liquor (AFI 5.1-

8), accounts for 5%. The amniotic fluid volume is quantified by ultrasonography, amniotic fluid index (AFI) is the commonly used semi quantitative measurement of amniotic fluid.¹ Oligohydramnios has been associated with increased maternal morbidity and fetal morbidity and mortality. An AFI of 5 cm or less has been used to define oligohydramnios and its association with adverse pregnancy outcome.¹

Borderline sonographic estimate of the amniotic fluid volume is defined as an AFI of 5.1 to 8.² Abnormalities like meconium staining, congenital malformations, growth restriction, dysmaturity, fetal hypoxia and

increased chance of operative delivery, has been associated with reduced amniotic fluid volume. Thus, the assessment of amniotic fluid volume is an important part of antenatal fetal surveillance. However, not all authors agree on the idea that AFI of 5 cm or lower is associated with an adverse pregnancy outcome.³ Since oligohydramnios has been associated with a variety of poor pregnancy outcomes, it has become an indication for induction of labor in pregnancies complicated by decreased amniotic fluid volume. 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.

Although little information is available on the perinatal risks associated with borderline AFI, recent observations have led to increased use of antepartum testing in women with a borderline AFI.

This study was undertaken because it was felt that there was an increasing trend of inducing patients who had borderline AFI after 37 weeks of gestation. There are numerous reported studies comparing the fetomaternal outcome between oligohydramnios and borderline liquor, but only limited number of studies compared the outcome after induction of labour in oligohydramnios, borderline liquor and normal liquor.

The present study was conducted with the objective to compare the fetomaternal outcome following induction of labor in between oligohydramnios, borderline liquor and normal liquor and to determine if patients with borderline liquor have pregnancy outcomes similar to oligohydramnios or normal liquor following induction.

METHODS

A retrospective study was conducted in a tertiary care teaching hospital at Puducherry of all the labour induction in women with oligohydramnios, borderline liquor and normal liquor volume for 2 years.

Inclusion criteria

- Women with singleton pregnancies with cephalic presentation induced between 37-42 weeks gestation.

Exclusion criteria

- Women with premature rupture of membranes and with congenital anomalies.

Induction of labour was done by dinoprostone and misoprostol as per the institutional protocol. The demographic characteristics, maternal outcomes like mode of delivery, indication for operative delivery, meconium stained liquor and perinatal outcomes like birth weight, Apgar at 5 min and NICU admissions were compared in between the three groups. Data was collected by verifying the medical records after obtaining approval of the Institutional Ethics Committee (Ref No. IEC:RC/16/157).

Collected data were entered in MS Excel spread sheet and statistical analysis was done using SPSS. Parametric data was compared by chi-square test and non-parametric data by students' t-test. A p-value less than 0.05 was taken as significant.

RESULTS

Among the 2338 deliveries during the study period, labour was induced in 266 women (11.3%). Out of which, 109 cases (41%) in oligohydramnios group, 111 cases (41.7%) in borderline liquor group and 46 cases (17.3%) in normal liquor group.

Among the three groups, majority belonged to the age group between 21-30 years. The differences in the mean age between the groups were not statistically significant. Majority of the women were primigravida induced between 37-40 weeks in all the three groups which was not statistically significant (Table 1).

Table 1: Distribution of subjects by age, gravidity and gestational age.

Parameter	Normal AFI AFI > 8 (n = 46)	Borderline AFI AFI 5.1 -8 (n =111)	Oligohydramnios AFI ≤ 5 (n = 109)	P- value
Age in years				
<20 years	2 (4.3%)	16 (14.4%)	9 (8.3%)	
21 -30 years	35 (76.1%)	86 (77.5%)	92 (84.4%)	
>30 years	9 (19.6%)	9 (8.1%)	8 (7.3%)	
Mean age	24.74	24.54	25.06	0.61
Gravidity				
Primigravida	31 (67.4%)	88 (79.3%)	79 (72.5%)	
Multigravida	15 (32.6%)	23 (20.7%)	30 (27.5%)	0.48
Gestational age in weeks				
37- 40	36 (78.3%)	97 (87.4%)	99 (90.8%)	
>40	10 (21.7%)	14 (12.6%)	10 (9.2%)	0.101

The rate of cesarean delivery was higher among the borderline liquor and oligohydramnios groups in comparison to the normal liquor group which was statistically significant. Fetal distress was the indication

for cesarean delivery in majority of the cases in both the groups (Table 2). There was no significant difference in the indications for cesarean delivery between the groups (Table 3).

Table 2: Comparison of mode of delivery.

Mode of delivery	Normal AFI (n=46)	Borderline AFI (n=111)	Oligohydramnios (n=109)	p-value
Normal vaginal delivery	42 (91.3%)	71 (64.0%)	68 (62.4%)	0.001
Instrumental delivery	4 (8.7%)	7 (6.3%)	5 (4.6%)	
LSCS	0 (0.0%)	33 (29.7%)	36 (33.0%)	

Table 3: Indication for cesarean delivery.

Indication	Normal AFI	Borderline AFI (n=33)	Oligohydramnios (n=36)	p-value
Fetal distress	0	16 (48.5%)	20 (55.6%)	0.32
Failed induction	0	2 (6.1%)	5 (13.9%)	
Others	0	15 (45.4%)	11(30.5%)	

The birth weight less than 2500 grams was higher among the oligohydramnios and borderline group in comparison with normal liquor group. The differences in the mean birth weight was statistically significant. Though meconium stained liquor was higher among the

oligohydramnios and borderline liquor group, it was not statistically significant. The Apgar <5 at 1min and <7 at 5min and NICU admissions were higher among the oligohydramnios group compared to the other two groups which was significant (Table 4).

Table 4: Comparison of fetal outcome.

Fetal outcome	Normal AFI (n=46)	Borderline AFI (n=111)	Oligohydramnios (n=109)	p- value
Birth weight				
< 2500 g	2 (4.3%)	16 (14.4%)	86 (78.9%)	<0.00001
>2500 g	44 (95.7%)	95 (85.6%)	23 (21.1%)	
Mean birth weight (in g)	3060	2890	2223	
Sex				
Female	20 (43.5%)	60 (54.1%)	54 (49.5%)	0.471
Male	26 (56.5%)	51 (45.9%)	55 (50.5%)	
Meconium stained liquor	0 (0.0%)	11 (9.9%)	10 (9.2%)	0.85
Apgar <5 at 1 min and <7 at 5 min	0 (0.0%)	0 (0.0%)	1 (0.9%)	0.485
NICU admission	2 (4.3%)	0 (0.0%)	11 (10.1%)	0.002

DISCUSSION

In the present study, majority of the cases belonged to the age group 21 to 30 years, as compared to other age groups which was similar to studies done by Akshaya K et al.² Incidence of oligohydramnios, borderline liquor and normal liquor was more among primigravida which was similar to as reported by Akshaya K et al.² There was increase in meconium stained liquor in oligohydramnios and borderline liquor group in contrast to studies that have shown oligohydramnios are at higher risk and the incidence is comparable between borderline liquor and

normal liquor.^{2,4,5} Gaikwad et al reported no significant difference between oligohydramnios and borderline liquor.⁶ Present study revealed the incidence of operative delivery was significantly higher in oligohydramnios group and borderline liquor compared to the normal group similar to Akshaya K et al.² Shahida et al and Wood et al have shown no significant difference in the incidence of operative delivery in the borderline AFI group and normal group.^{4,7}

Fetal distress was found to be the most common indication for cesarean delivery in the oligohydramnios

and borderline liquor groups compared to control group though not statistically significant similar as Akshaya K et al and Ashraf J et al.^{2,5} Several studies have reported significant increase in the incidence of LSCS and the indication for fetal distress among the oligohydramnios group and no significant difference in the borderline AFI group and normal group.^{4,6,8}

In present study, low Apgar score at 5 minute and admissions to NICU were significantly higher among the oligohydramnios group compared to the borderline and normal liquor group which was similar to various studies.^{4,9} On the contrary certain studies have reported neonatal complications were higher among borderline liquor in comparison to normal liquor group.^{5,10} Gumus et al reported an increase in the incidence meconium stained amniotic fluid, NICU admission, and intrapartum fetal distress in pregnancies with a borderline AFI compared to pregnancies with normal liquor.⁹

Studies have reported no statistical difference in neonatal outcome among the oligohydramnios and borderline liquor.^{6,8} In present study, there was a significant increase in low birth weight babies among the oligohydramnios group when compared to borderline and normal liquor groups which was similar to Locatelli et al.¹¹ Certain studies have reported increased incidence of IUGR among pregnancies with borderline liquor compared to those with normal liquor.^{7,9}

CONCLUSION

Induction of labor at term in women with oligohydramnios and borderline liquor are associated with an increased risk of cesarean section or instrumental vaginal delivery and intrapartum fetal distress and with increased risk of meconium stained liquor in comparison to normal liquor. Low Apgar score, low birth weight and admission to NICU was higher in the oligohydramnios group compared the other two groups. Induction of labour on detecting borderline liquor at term may help in reduction of maternal and fetal morbidity and mortality.

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