

Reduced Amniotic Fluid Index– Does It Affect Maternal And Perinatal Outcome In Low Risk Term Pregnancy?

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Abstract: To study the Maternal and perinatal outcome in reduced amniotic fluid index (AFI) at term in low risk pregnancies. A Prospective case control study of term, low risk pregnancy, reduced AFI within two study groups, group b1 (AFI=5-8cm) 98 patients and group b2 (AFI=less than 5cm) 95 patients diagnosed by ultrasound after 37 completed weeks of gestation compared with 180 controls (AFI>8cm). The selected outcomes showed significant variations in two study groups. There were increased chances of induced labor, thick meconium, increased caesarean rates in study group b2 (AFI less than 5cm) but did not affect perinatal outcome which was statistically significant. Isolated reduced AFI at term is not associated with adverse perinatal outcomes. However, it increases the risk of labour induction and Caesarean section rate.

Keywords: Caesarean section, isolated, reduced AFI, perinatal outcome

INTRODUCTION

Oligohydramnios complicates 1% to 5% of pregnancies at term and is associated with increased maternal and foetal morbidities in high risk patients[1,2]. The perinatal morbidity and mortality is high due to foetal distress, low APGAR scores and meconium aspiration syndrome in the foetus[3]. This could be due to umbilical cord compression, potential utero-placental insufficiency and the increased incidence of meconium stained liquor and oligohydramnios[4,5]. Many centres induce labor when the AFI is less than 8 cm in low risk pregnancies due to above listed fetal complications [6-8]. However, recent studies on isolated oligohydramnios in term low risk patients did not show any effect on perinatal outcome [9]. Due to these conflicting views in literature we aimed to study the effect of isolated oligohydramnios in low risk term pregnancies in Indian population.

MATERIAL AND METHODS

This Prospective observational Study was conducted in the Department of Obstetrics and Gynaecology at ESIC Medical College and Safdarjung hospital from October 2015 to March 2017. The study was approved by institutional ethical committee. After a written informed consent, total 373 women were selected fulfilling the inclusion criteria. Each participant was allocated to one of the two Groups A or B after measurement of AFI.

Group A (n=180) – women with AFI more than 8cm

Group B (n=152) – women with AFI less than 8cm.

Group B1 (n=78) – AFI 5-8cm

Group B2 (n=75) – AFI less than 5cm

Inclusion criteria

- Antenatal women between 37 -40weeks of gestation,
- Single fetus in cephalic presentation.

Exclusion criteria

- Maternal medical diseases like severe preeclampsia, jaundice, diabetes or heart diseases, chronic renal or liver disease
- Previous caesarean section
- History of ante partum hemorrhage
- congenital malformations,

- IUGR
- PROM
- prematurity (< 37th gestational week)
- Post-dated (>40 weeks)

All women recruited for study, underwent complete antenatal examination and investigation. Gestational age was confirmed by last menstrual period and first trimester sonography. AFI measurements were performed with a real time ultrasound instrument equipped with a 3.5 MHz linear array transducer between 37 -40 weeks. All measurements were performed according to the “four quadrants technique” defined by Phelan and colleagues. According to the measurement of AFI, two groups were formed as: group a; AFI >8 (normal AFI) and group b; AFI ≤ 8cm (oligohydramnios) which further subdivided into, group b1;AFI 5-8cm(mild oligohydramnios) group b2;AFI <5cm (severe oligohydramnios). Fetal assessment was done by NST, DFMC and patients were allowed for spontaneous onset of labour. Intrapartum monitoring was done as per hospital protocol. Mode of delivery and indications for caesarean delivery were recorded. Neonatal outcomes were analysed by 1st and 5th minute Apgar scores. Other tests and treatment given to the babies were determined by attending paediatrician.

Statistical Analysis

Data was recorded on a predesigned preform and deciphered at the end of the study. Data was expressed as Mean ± 2 SD (95% confidence intervals), numbers (percentages) and median and was analysed using Pearson’s chi square/ Fisher’s exact test, repeated measures ANOVA (parametric or nonparametric) or multiple logistic regression techniques, whichever was appropriate depending upon their nature. In all cases, p value< 0.05 was considered (IBM, Armonk, NY, USA) was used for data presentation and statistical analysis.

RESULTS

Total 333 patients were recruited in study and divided into three groups on the basis of the AFI as discussed earlier. There was no difference in

demographic profile between study groups and control group as shown in Table 1. In the study group b2, induction of labor was required in 60% women for low biophysical profile score(less than 8) (24%), non-reassuring nonstress test(26.67%), history of previous IUD (9.33%), while on the converse 23.08% in group b1 and 20% in group a patients had undergone induction of labor for similar indications. This was statistically significant (p value=.001) that induced labor was higher in patients of isolated oligohydramnios (AFI less than 5cm). (Table 2)

Thick meconium stained liquor was found in 20% of women in group b2 while on the contrary 3.84% and 10% in group b1 and group a respectively which was found to be statistically significant(p=0.002) shown in table 3.

Increase in the number of caesarean deliveries was found in group B2(66.67%) for failed induction(34.67%), foetal distress(26.67%) , non-progress of labour(4%) as compared to group B1 (7.69%) and group A (8.33%) respectively depicted in table 4. The rates of both elective and emergency caesarean section for failed induction were high in the oligohydramnios group demonstrating the low threshold for caesarean section among the obstetricians in the oligohydramnios group. Therefore, increased rate of caesarean delivery was attributed to the induction process.

Neonatal outcome as discussed in table 5 on following parameters i.e. birth weight, Apgar score, NICU admission, need for ventilator support, neonatal death, prolonged nursery stay compared in among three groups with no statistical difference. Our study has shown that pregnancies complicated by isolated oligohydramnios are not associated with adverse perinatal outcomes. No difference was found in the perinatal mortality and morbidity and low Apgar scores in the study groups when compared with the control group.

Table 1: Demographic profile

	Group b1(n=98)	Group b2(N=95)	Group a(N=180)
Average age	26.4	26.2	27.2
PARITY			
primigravida	52	55	95
multigravida	46	40	85
	There is no demographic difference in age and parity between groups		

Table 2: Comparison among three groups on maternal and fetal outcome

characteristic	Group b2(<5cm) n=95	Group a(>8cm) n=180	P value Group b2 and a	Group b1(5-8cm) n =98	P value Group b1 and a
Induced labor	57(60.0%)	36(20%)	.0001(s)	23(23.5%)	ns
INDICATION OF INDUCTION					
Non reassuring NST	25(26.32%)	26(14.44%)	0.06(ns)	15(15.3%)	ns
Previous IUD	09(9.47%)	05(2.78%)	Ns	05(5.1%)	ns
Decrease FM+BPP	23(24.21%)	05(2.78%)	.0004(s)	03(3.1%)	ns

Table 3: Color of liquor

characteristic	Group b2(<5cm) n=70	Group a(>8cm) n=150	P value Group b2 and a	Group b1(5-8cm) n =75	P value Group b1 and a
clear	65(68.4%)	153(85%)	.071(ns)	89(90.826%)	ns
thin	11(11.6%)	08(4.44%)	.22(ns)	06(6.12%)	ns
thick	19(20%)	19(10.56%)	.002(s)	03(3.06%)	ns

Table 4: Mode of delivery

characteristic	Group b2(<5cm) n=70	Group a(>8cm) n=150	P value Group b2 and a	Group b1(5-8cm) n =75	P value Group b1 and a
Vaginal delivery	30(31.56%)	156(86.67%)	.001(s)	87(88.78%)	ns
Operative vaginal	11(11.58%)	9(5%)	.344(ns)	04(4.08%)	ns
Caesarean delivery	64(67.37%)	15(8.33%)	.0001(s)	07(7.14%)	ns
Fetal distress	26(27.37%)	11(6.11%)	.002(s)	03(3.06%)	ns
Failed induction	34(35.79%)	2(1.11%)	.0001(s)	03(3.06%)	ns
Non progress of labor	04 (4.21%)	02(1.11%)	1.0(ns)	01(1.02%)	ns
Total	48(68.6%)	12(8%)	.0001(s)	05(6.6%)	ns

Table 5: Perinatal outcome

characteristic	Group b2(<5cm) n=70	Group a(>8cm) n=150	P value Group b2 and a	Group b1(5-8cm) n =75	P value Group b1 and a
Apgar score <7	19 (20%)	14 (7.78%)	.372(ns)	12(12.24%)	ns
Nicu admission	14 (14.74%)	08 (4.44%)	.336(ns)	08(8.16%)	ns
Baby needing ventilatory support	03 (3.16%)	04 (2.22%)	.820(ns)	01(1.02%)	ns
Neonatal death	01 (1.05%)	01 (0.56%)	.778(ns)	00	ns
Prolonged Nursery Stay	01(1.05%)	01(0.56%)	ns	00	ns

DISCUSSION

Most of the studies on the effect of reduced liquor have been done on the group with AFI less than 5cms. All the same, demographic profile of our study groups and control group was comparable with other studies[10-31].

In the present study, significantly higher induction i.e. 60% of labour was performed among women with AFI less than 5cm. Similar study by ahead *et al.* depicted the rate of induction of labour was found to be as high as 63% in patients with isolated oligohydramnios compared to an induction rate of 14 % in the unexposed group. (p < 0.001)[14] This is similar to other authors who also reported 50% of low risk

women with reduced amniotic fluid volume underwent induction of labour[15].

Regarding thick meconium stained liquor, it was found in 20%, 3.84% and 10% in group b2,b1 and group a respectively. This difference was statistically significant. Similar study done by Chate P *et al.* revealed increased incidence of meconium stained liquor after amniotomy in patients with amniotic fluid index less than 5cm[16].

Pregnancies with AFI less than 5cm have been reported with higher rates of caesarean section which was 66.67% as compared with pregnancies AFI more than 5cm. While it was seen most common indication for caesarean section was failed induction, followed by fetal distress and non-progress of labour. In concordance to our study, Conway's retrospective, case-controlled study, women who were induced for oligohydramnios had an increased rate of caesarean section when compared women with oligohydramnios who were in spontaneous labor. The authors postulated that this increase was caused by the induction process itself[17].

In a Meta-analysis, reduced amniotic fluid volume was associated with increased risk of Caesarean section due to foetal heart rate abnormalities[18]. Others have also reported similar findings[15,19].

Rainford's study of outcomes in exclusively term, low-risk patients failed to show significant outcome differences in rates of caesarean delivery for non-reassuring fetal heart rate monitoring, but this study was limited due to its retrospective design[10].

Similarly, In a case-control study by Conway, 183 low-risk, term parturient with oligohydramnios were matched to 183 women of similar gestational age and parity who presented in spontaneous labour. The patients with isolated oligohydramnios were induced and showed an increased caesarean delivery rate. The increased rate of caesarean delivery was not due to non-reassuring fetal surveillance and was attributed to the induction process[17].

Neonatal outcome as discussed in table 5 on following parameters birth weight, apgar score, NICU admission, need for ventilator support, neonatal death, prolonged nursery stay compared in among three groups with no statistical difference. Present study has shown that pregnancies complicated by isolated oligohydramnios are not associated with adverse perinatal outcomes. No difference was found in the perinatal mortality and morbidity and low Apgar scores in the study group when compared with the control group. The results are consistent with that of other

studies done on the low risk population [20-23] and These results also strongly correlate with a recent study which used data from multicentre clinical trial of Routine Antenatal Diagnostic Imaging with Ultrasound (RADIUS) to reported that isolated oligohydramnios is not associated with impaired foetal growth or an increased risk of adverse Perinatal outcome[11].

Similar results from Ek *et al.* study found that active versus expectant management of oligohydramnios in women with uncomplicated pregnancies at term resulted in no difference in maternal or neonatal outcomes. Because of the small number of women in the study group, this study did not have sufficient power to determine a significant relationship between oligohydramnios and neonatal outcomes[20].

CONCLUSION

Women with isolated oligohydramnios without obstetrical complications, there is no increase in adverse perinatal outcome. Therefore, should not be an indication for induction of labour or elective caesarean delivery.

The limitation of this study is that this was a hospital based study our figures are not strictly representative of the whole population so, future research and prospective studies are needed for a further conclusion.

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Competing interests

There are no competing interests to declare

Ethical approval

The study was approved by the Institutional ethics committee

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