

# Decreased Amniotic Fluid Index in Low-Risk Pregnancy : Any Significance ?

Desai Pankaj, Patel Purvi, Gupta Anjali

The Department of Obstetrics and Gynecology, Medical College and S.S.G. Hospital, Baroda.

**OBJECTIVE** – To find out if low amniotic fluid index (AFI) has any clinical significance in low-risk pregnancies  
**METHODS** – A case controlled prospective study was done. Fiftyfive consecutive subjects with term pregnancy and low amniotic fluid index (AFI) of  $\leq 5$ cms attending the labour room having no known high risk factor were matched with equal number of controls admitted immediately after the indexed cases with normal AFI. In both the groups the exclusion and inclusion criteria were matched except the AFI. The following outcomes were assessed 1) CTG changes 2) Need for LSCS due to CTG changes 3) Presence of meconium 4) Apgar score at 5 minutes 5) Need for admission of neonate to neonatal intensive case unit (NICU) and 6) perinatal mortality. **RESULTS** – There was no statistically significant difference between the two groups as regards the fetal heart rate abnormalities. However, subjects with variable decelerations were more in the group with AFI  $\leq 5$  than in the controls. But this difference too was statistically not significant. There was no significant difference in cesarean section rates in the two groups. Instrumental vaginal deliveries with vacuum extractor and forceps were also not significantly different in the two groups. There were no subjects with meconium stained liquor amnii. None of the babies in either group were severely asphyxiated. None of the babies required an admission to NICU and there was no perinatal mortality in either group. **CONCLUSION** – Reduced AFI in the absence of any known high-risk factor has no clinical significance.

**Key words :** amniotic fluid index, low risk pregnancy

## Introduction

A finding of diminished amniotic fluid index (AFI) is generally perceived as a sign of placental insufficiency. There is a consistent association between low AFI and conditions like pregnancy induced hypertension resulting in poor fetal outcome. Infact, there may be a need to deliver quickly<sup>1</sup>. However, clinicians are aware of the fact that low AFI is found, though uncommonly, with no known risk factors. Apprehensions are expressed regarding such isolated finding leading to increased obstetric interventions without improvement in perinatal outcomes<sup>2</sup>. It is necessary to find out whether a low AFI in the absence of any high-risk factors has any significant effect on obstetric outcome.

## Material and Methods

This is a prospective study carried out over a period of 5 years from January 1999 to December 2003. All singleton, term, non-anomalous pregnancies with AFI of  $\leq 5$  cms at admission in labor room with intact membranes were included in this study. Previous

perinatal loss, recurrent missed abortions, previous cesarean section, evidence of growth retardation (both clinical and ultrasonographic), post-term pregnancies, medical disorders which can have a bearing on the fetomaternal outcome like preeclampsia, diabetes and heart disease were all excluded from the study. An admission CTG (cardiotocography) was done in all cases in the study.

These subjects were matched with those with AFI  $> 5$  but  $\leq 20$  cms who served as controls. Both groups were matched for age, parity, hemoglobin status, duration of pregnancy, non-anomalous conceptus and intact membranes. Women admitted in labor room for delivery, immediately after the indexed cases, matched for criteria described above and exclusion criteria applied as for indexed cases with AFI  $\geq 5$  but  $\leq 20$  cms constituted controls. Thus, for each case there was one matched control. The same team of obstetricians monitored the labor and conducted the delivery of both the groups.

The following outcomes were assessed – 1) CTG changes 2) need for LSCS due to CTG changes 3) presence of meconium 4) Apgar score at 5 minutes 5) need for admission of neonate to neonatal intensive case unit (NICU) and 6) perinatal mortality.

Outcomes in both the groups were carefully recorded, analyzed and statistically evaluated by Epi-Info software.

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Correspondence :

Dr. Pankaj Desai

Guru Krupa, Opp. Alankar Apartments, Dandia Bazaar,  
Baroda - 390 001. Tel. 91-265-2437793 / 2432519

Email : meera@wilhnetonline.net

## Results

During the study period there were 55 women with AFI  $\leq 5$  cms with low-risk. These were matched with 55 women with AFI  $> 5$  but  $\leq 20$  cms after applying same exclusion and inclusion criteria in both the groups.

As shown in Table I there was no statistically significant difference between the two groups as regards the fetal heart rate abnormalities. However women with variable decelerations were more in the group with AFI  $\leq 5$  cms when compared to the controls. But this difference too was statistically not significant.

As shown in Table II, there was no significant difference in cesarean sections in the two groups. Instrumental vaginal deliveries with vacuum extractor and forceps were also not significantly different in the two groups.

There was no significant difference in the indications for cesarean sections in the two groups (Table III). AFI  $\leq 5$  cms in low risk pregnancies did not invite more cesareans deliveries due to abnormal heart rate tracings on CTG.

There were no women with meconium stained liquor amnii. There were three babies in the study group with Apgar score less than 7 at 5 minutes as against only one baby in the control group. All these babies were easily resuscitated by bag and mask. None of the babies in either group were severely asphyxiated (Apgar less than 4). The mean birth weight of babies in the study group was  $2520 \pm 120$  gms as against  $2650 \pm 150$  gms in the control group. None of the babies required an admission to NICU and there was no perinatal mortality in either group.

**Table I. Cardiotecography Features**

	AFI $\leq 5$ cms	AFI $> 5$ cms	P value <sup>a</sup>
Normal basal heart rate (110-150)	54	53	0.31
Beat to beat variability (5-25)	52	54	0.17
Accelerations $> 10$ beats per minute	54	51	0.5
Accelerations $> 15$ beats per minute	51	52	0.5
Late decelerations	01	00	NA
Variable deceleration	06	01	0.05

<sup>a</sup> P values  $> 0.05$  not significant

<sup>a</sup> In cells where number was less than 5 Fisher's exact value of P was applied

**Table II. Mode of Delivery**

Mode	AFI $\leq 5$ cms	AFI $> 5$ cms	P value <sup>a</sup>
LSCS	10	11	0.81
Instrumental vaginal delivery	04	04	NA
Normal vaginal delivery	41	40	0.83

<sup>a</sup> P values  $\geq .05$  - Not significant

**Table III. Indications for LSCS**

Indications	AFI $\leq 5$ cms	AFI $> 5$ cms
Abnormal heart pattern	03	01
Non-progressive labor	05	05
Thick meconium liquor	01	02
Cord Prolapse	00	01
CPD	01	02

X<sup>2</sup> value : 2.63, P value 0.62 at df 4. Not significant

## Discussion

Reduced liquor amnii in high-risk pregnancies carries an increased risk of intrapartum complications<sup>1</sup>. However, the picture in low risk pregnancies is less clear. Conflicting views are expressed in different studies<sup>2,3</sup>. Reduced AFI in low risk pregnancy is not a common phenomenon. We encountered 55 cases in 5 years. Other studies have reported 57, 60 and 79 cases<sup>4,6</sup>. In the present study, after excluding the high-risk factors and matching the controls well, we did not find much significance of low AFI in low-risk pregnancies.

Variable deceleration is known to be a result of cord compression in labor. We did find an increase in variable decelerations in women with low AFI. This was statistically of just borderline significance but did not result in increased caesarean section rate.

Fetal outcome also is a matter of concern in subjects with low AFI. There was neither any admission to NICU nor any perinatal mortality in the study group. Kreiser et al<sup>7</sup> found a small but insignificant increase in babies born with low Apgar score at 5 minutes when the AFI was less. But they too had neither any perinatal mortality nor admission of these babies in NICU.

Meconium staining of liquor amnii is supposed to be an indication of fetal distress and has its own dreaded complications in the new born. None of the women in either of our groups had meconium stained liquor amnii. Similar results are reported by Greenwood et al<sup>8</sup> in a study of 83 women.

It seems clear that reduced AFI in low risk pregnancies has no adverse effect on labor or perinatal outcome.

## References

1. Magann EF, Kinsella MJ, Chauhan SP et al. Does an amniotic fluid index of  $\leq 5$  cm necessitate delivery in high-risk pregnancies? A case-control study. *Am J Obstet Gynecol.* 1999; 180(6 Pt 1): 1354-9.
2. Ghosh G, Marsal K, Gudmundsson S. Amniotic fluid index in low-risk pregnancy as an admission test to the labor ward. *Acta Obstet Gynecol Scand* 2002;81:852-5.
3. Myles TD, Santolaya-Forgas J. Normal ultrasonic evaluation of amniotic fluid in low-risk patients at term. *J Reprod Med* 2002;47:621-4.
4. Zhang J, Troendle J, Meikle S et al. Isolated oligohydramnios is not associated with adverse perinatal outcomes. *BJOG.* 2004;111:220-5.
5. Magann EF, Chauhan SP, Boil JA et al. Comparability of the amniotic fluid index and single deepest pocket measurements in clinical practice. *Aust N Z J Obstet Gynecol.* 2003;43:75-7.
6. Morris JM, Thompson K, Smithey J et al. The usefulness of ultrasound assessment of amniotic fluid in predicting adverse outcome in prolonged pregnancy: a prospective blinded observational study. *BJOG.* 2003;110:989-94.
7. Kreiser D, El-Sayed Y Y, Sorem K A. Decreased amniotic fluid index in low risk pregnancy. *J Reprod. Medicine* 2001;46:743-6.
8. Greenwood C, Lalchandani S, MacQuillan K et al. Meconium passed in labor: how reassuring is clear amniotic fluid? *Obstet Gynecol* 2003;102:89-93.