

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

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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 ≤ 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 ≤ 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 quickly¹. 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 outcomes². 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 ≤ 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 ≤ 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 ≥ 5 but ≤ 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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Results

During the study period there were 55 women with AFI ≤ 5 cms with low-risk. These were matched with 55 women with AFI > 5 but ≤ 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 ≤ 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 ≤ 5 cms in low risk pregnancies did not invite more cesarean 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 ± 120 gms as against 2650 ± 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 ≤ 5 cms | AFI > 5 cms | P value ^a |
|---------------------------------------|------------------|---------------|----------------------|
| 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 |

^a P values > 0.05 not significant

^a In cells where number was less than 5 Fisher's exact value of P was applied

Table II. Mode of Delivery

| Mode | AFI ≤ 5 cms | AFI > 5 cms | P value ^a |
|-------------------------------|------------------|---------------|----------------------|
| LSCS | 10 | 11 | 0.81 |
| Instrumental vaginal delivery | 04 | 04 | NA |
| Normal vaginal delivery | 41 | 40 | 0.83 |

^a P values $\geq .05$ – Not significant

Table III. Indications for LSCS

| Indications | AFI ≤ 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 |

χ^2 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 complications¹. However, the picture in low risk pregnancies is less clear. Conflicting views are expressed in different studies^{2,3}. 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^{4,6}. 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 al⁷ 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 al⁸ 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.

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