

# Role of Low Amniotic Fluid Index (AFI) on Perinatal Outcome in Women with Term Pregnancy

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## ABSTRACT

**Objective:** To determine the role of low amniotic fluid index (AFI) as a predictor of perinatal outcome in women presented with term pregnancy.

**Study design:** Retrospective/Observational study

**Place & Duration:** Department of Gynae & Obs Mardan Medical Complex MTI, Mardan for duration of six months from November 2019 to April 2020.

**Materials and Methods:** Total 96 patients with gestational age  $\geq 38$  weeks were included in this study. Two groups were maintained, group I with 48 patients having AFI  $\leq 5$  cm and group II with 48 patients having AFI  $> 5$  cm. Outcomes were compared between both groups in terms of NST measure, mode of delivery, Apgar score at 5 minutes, NICU admission, low birth weight, meconium aspiration and respiratory distress.

**Results:** Mean age of patients in group I was  $26.52 \pm 4.88$  years and in group II it was  $27.08 \pm 3.86$  years. Mean gestational age in group I was  $38.02 \pm 1.86$  weeks and in group II it was  $38.54 \pm 1.42$  weeks. No significant difference was observed regarding reactive non-stress test and cesarean section between both groups I and II [(Reactive 38 (79.17%) Vs 34 (70.83%)] and [14 (29.17%) and 11 (22.92%)] with p-value  $> 0.05$ . A significant difference was found regarding neonatal outcomes between both groups I and II with p-value  $< 0.05$ .

**Conclusion:** Low amniotic fluid index is associated with poor neonatal outcomes as compared to amniotic fluid index  $> 5$  cm.

**Key words:** Amniotic Fluid Index (AFI), Term Pregnancy, Neonatal Outcomes.

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## INTRODUCTION

Modern obstetrics concentrate on mother and unborn children's health and well-being. The core components of modern perinatal medicine are the detection of a foetus at death or damage to the uterus, quantification of the risk, balancing the risk of neonatal complications with immaturity, and assessing the appropriate time and mode of action.<sup>1</sup> An integral aspect of foetal evaluation is the clinical measurement of amniotic fluid volume (AFV) as variance in its quantity has been linked to a number of pregnancy complications. The foetus is protected against mechanical, biological injuries by amniotic fluid<sup>2,3</sup> and is protected against foetal development. Amniotic fluid quantification is critical in ultrasound evaluation of foetal health, particularly in the third trimester, of the biophysical profile.<sup>4</sup> The volume of amniotic fluid is the basic evaluation of chronic uterine stress by antenatal tests. Ultrasound is a non-invasive procedure that is suitable for large-scale applications and can also be used in the case of suspected anomalies to detect AFV again.<sup>3</sup> Relations were found in decreased amount of amniotic and stillbirths, foetal irregular foetal abnormalities, laboratory irregular FHR tracing, foetal discomfort in the caesarean section and likely foetal acidosis.<sup>2</sup> In this research, the four-quadrant technique defined by Dr. Phelan et al.<sup>5</sup> has been used for amniotic fluid quantification in the determination of AFI and we were seeking an indicator for an antepartum AFI 5 cm or less of adverse perinatal outcomes in terms of meconium staining, a caesarean section for foetal distress, birth weight, low levels of apgar, and cord pH.<sup>3</sup> We conducted present study to determine the role of low

amniotic fluid index as a predictor of adverse perinatal outcomes in women with term pregnancy.

## MATERIAL AND METHOD

This study was conducted at Department of Obstetrics & Gynaecology Mardan Medical Complex MTI Mardan for duration of six months from November 2019 to April 2020. Total 96 patients with gestational age  $\geq 38$  weeks were included in this study. Two groups were maintained, group I with 48 patients having AFI  $\leq 5$  cm and group II with 48 patients having AFI  $> 5$  cm. Patients detailed demographics including age, gestational age and complete medical history were recorded after taking informed written consent. Patients with prior perinatal loss, previous caesaries, repeated missed abortions, post-term pregnancy, IUGR facts, medical condition affecting foetal-maternal outcomes such as hypertension, diabetes and heart disease, were ruled out. Non-stress test was done at the time of admission. Outcomes were compared between both groups in terms of NST measure, mode of delivery, Apgar score at 5 minutes, NICU admission, low birth weight, meconium aspiration and respiratory distress. Data was analyzed by SPSS 24.0. Chi-square test was done to compare the outcomes between both groups. P-value  $< 0.05$  was considered as significant.

## RESULTS

Mean age of patients in group I was  $26.52 \pm 4.88$  years and in group II it was  $27.08 \pm 3.86$  years. Mean gestational age in group I was  $38.02 \pm 1.86$  weeks and in group II it was  $38.54 \pm 1.42$  weeks, no significant difference found

regarding age and gestational age between both groups I and II (p-value >0.05). No significant difference was observed regarding reactive non-stress test and cesarean section between both groups I and II [(Reactive 38 (79.17%) vs 34 (70.83%)] (Table 1). According to the mode of delivery 14 (29.17%) and 11 (22.92%) patients in group I and II had cesarean section, 34 (70.83%) and 37 (77.08%) patients had normal vaginal delivery. No significant difference was observed between both groups regarding mode of deliver with p-value >0.05. (Table 2). According to the neonatal outcomes, a significant poor outcomes were found in patients having AFI ≤5 cm as compared to patients with normal AFI >5 cm with p-value <0.05. (Table 3)

Table 1: Baseline details of patients

Variables	Group I (AFI <5 cm)	Group II (AFI >5 cm)	P-value
Age	26.52±4.88	27.08±3.86	>0.05
Gestational age	38.02±1.86	38.54±1.42	>0.05
NTS			
Reactive	38 (79.17)	34 (70.83)	>0.05
Non-reactive	10 (20.83)	14 (29.17)	

Table 2: Mode of delivery between both groups

Mode of Delivery	Group I (AFI <5 cm)	Group II (AFI >5 cm)	P-value
C-section	14 (29.17)	11 (22.92)	>0.05
Normal	34 (70.83)	37 (77.08)	>0.05

Table 3: Neonatal outcomes between both groups

Variables	Group I (AFI <5 cm)	Group II (AFI >5 cm)	P-value
Apgar score at 5 minute			
<7	17 (35.42)	6 (12.5)	0.022
>7	31 (64.58)	42 (87.5)	
NICU Admission	6 (12.5)	0 (0)	0.001
Meconium aspiration	6 (12.5)	1 (2.08)	0.02
Low birth weight	5 (10.42)	1 (2.08)	0.028
Respiratory Distress	4 (8.33)	0 (0)	0.001

## DISCUSSION

Many studies have shown that an adverse perinatal effect is associated with a small amniotic fluid index; in many reports, in borderline AFI pregnancies maternal and foetal complications were reported more frequently than in those with regular AFI.<sup>6,7</sup> We conducted present study to examine the association of low amniotic fluid index with adverse perinatal outcomes in women with term pregnancy. In this regard 96 women with term pregnancy were enrolled. Among them 48 patients had AFI <5 cm and 48 patients had AFI >5 cm to 20 cm. Majority of patients 72% in our study were ages 25 to 30 years. These results showed similarity to some previous studies in which majority of patients had ages 25 to 30 years.<sup>8,9</sup>

In present study we found that No significant difference was observed regarding reactive non-stress test and cesarean section between both groups I (AFI <5cm) and II (AFI >5cm) [(Reactive 38 (79.17%) vs 34 (70.83%)]. We found that according to the mode of delivery 14 (29.17%) and 11 (22.92%) patients in group I and II had cesarean section, 34 (70.83%) and 37 (77.08%) patients had normal vaginal delivery. No significant difference was observed between both groups regarding mode of deliver with p-value >0.05. A study conducted by Iqbal et al<sup>10</sup>

reported that no significant difference was observed regarding cesarean section between patients with low AFI and patients with AFI>5 cm.

In our study we found that patients with low AFI had significantly poor neonatal outcomes as compared to patients with AFI >5 cm. Among patients with low AFI, 17 (35.42%) patients had apgar score <7 at 5 minutes and among patients with normal AFI 6 (12.5%) patients had apgar score >7 at 5 minutes, a significant difference was observed with p-value 0.022. A study conducted by Moin et al<sup>11</sup> reported that the frequency of low Apgar score was 14 patients (15.73%) in low AFI group versus only 3 patients (3.37%) in normal AFI group, the difference being statistically significant (p=0.005).

We found that frequency of NICU admission, meconium aspiration, low birth weight and respiratory distress syndrome were high in low AFI <5 cm group as compared to patients with AFI >5 cm with p-value <0.05. Many of previous studies demonstrated that women with low AFI had significantly poor neonatal outcomes as compared to women with normal AFI >5cm.<sup>12-14</sup> A study conducted by Bhagat et al<sup>15</sup> reported that in patients with oligohydramnios (p=0.048, 0.001, respectively), the cesarean section incidence was higher in foetal distress and low birth weight infants, <2.5 kg. The meconium stain did not vary greatly, and Apgar was 5 min < 7. Another study by Mathuriya et al<sup>16</sup> demonstrated that a significant low APGAR score in babies of low AFI. Frequency of IUGR was high in patients with low AFI as compared to patients with normal AFI.

## CONCLUSION

Patients with low amniotic fluid index had significantly poor neonatal outcomes in term of apgar score at 5 minutes, NICU admission, low birth weight, meconium liquor and respiratory syndrome as compared to amniotic fluid index >5 cm.

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