

## Amniotic Fluid Volume and Pregnancy Outcome

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### Abstract

*Introduction:* Amniotic fluid provides a protective cushion effect for growing fetus. It maintains the temperature and provides a thermally stable environment for fetus. It acts as shock absorber, protecting fetus from possible external injury. Amount of amniotic fluid is good indicator of baby's wellbeing in advanced gestational age. It constitutes the important part of fetal wellbeing test called as biophysical profile. This biophysical profile is ultrasound test along with NST. *Method and Materials:* It is a retrospective study conducted in Srinivas institute of Medical Sciences and Research Centre, and other centers. In which records were studied by follow up from February 2017 to January 2018. Amniotic fluid volume was noted within 7 days of delivery or at the time of admission to hospital. The patients were divided into 2 groups with reduced amniotic fluid volume (AFI <5) and normal amniotic fluid volume (AFI >5cm). *Results:* Out of 1928 records studied. In that 612 patients were recruited for the study. Out of them 25 (28.41%) women in reduced amniotic fluid volume and 104 (19.85%) women in normal amniotic fluid volume, had meconium passage. Labor pain was induced in 61 (69.32%) in reduced amniotic fluid volume and 132 (25.19%) in normal amniotic fluid volume, Total 67 (76.14%) patients in reduced amniotic fluid volume and 126 (24.05%) in normal amniotic

fluid volume, had LSCS in that 36 (40.90%) women in reduced amniotic fluid volume and 41 (7.82%) women in normal amniotic fluid volume has non reassuring fetal heart rate pattern as indication of LSCS. *Conclusion:* Present study showed that reduced amniotic fluid volume good indicator of poor pregnancy outcome.

**Keywords:** Induction of Labor; AFI; Ante Partum Surveillance; Non Reassuring Fetal Heart Rate Pattern; LSCS.

### Introduction

Healthy mother and healthy baby are main concern in our modern obstetrics. Identifying baby at risk in utero and balancing it with problems of immaturity are given importance in modern [1]. Amniotic fluid provides a protective cushion effect for growing fetus. It maintains the temperature and provides a thermally stable environment for fetus [2,3]. It acts as shock absorber, protecting fetus from possible external injury. Amount of amniotic fluid is good indicator of baby's wellbeing in advanced gestational age. It constitutes the important part of fetal wellbeing test called as biophysical profile. This biophysical profile is ultrasound test along with NST. Amount of amniotic fluid is calculated with ultrasound machine. The different methods for calculating amniotic fluid volume are

1. Deep vertical pocket (Single deepest pocket).
2. Amniotic fluid index - AFI (by four quadrant method)

### *Aim of the study*

To study the impact of amniotic fluid volume in pregnancy.

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## Method & Materials

It is a retrospective study conducted in Srinivas institute of Medical Sciences and Research Centre, Mangalore Fetal Medicine centre and other private hospitals in which records were studied by follow up from February 2017 to January 2018. Out of 1928 records studied. In that 612 patients were recruited for the study.

### Inclusion criteria:

34 - 41 weeks of pregnancy

Singleton pregnancy

Intact membranes

### Exclusion criteria:

Pregnant women with medical disorders

Pregnancy complications

Rupture of membranes.

Twin or multiple pregnancies

Fetal abnormalities

Detailed history and clinical findings were noted and gestational age was assessed according to LMP or first trimester scan. Amniotic fluid volume (AFI) was noted within 7 days of delivery or at the time of admission to hospital. They were divided into 2 groups reduced amniotic fluid volume (AFI <5) and normal amniotic fluid volume (> 5cm). And analysis was done using SPSS (IBM, USA.) window software program.

## Results

Out of 612 women 88 (14.38%) women had reduced amniotic fluid volume - AFI < 5 cm (Group 1) and 524 (85.62%) had normal amniotic fluid volume - AFI > 5m (Group 2) as depicted in Table 1. The mean maternal age was 25.23 years in reduced amniotic fluid volume and 25.42 in normal amniotic fluid volume. In that 52 (59.09%) women was nulliparous in reduced amniotic fluid volume and 301 (57.44%) in normal amniotic fluid volume. Period of gestation was <37 weeks in 49 (55.68%) patients in reduced amniotic fluid volume and 79 (15.08%) in normal amniotic fluid volume group II. Pregnancy outcome were studied in both groups. 25 (28.41%) women in reduced amniotic fluid volume and 104 (19.85%) women in normal amniotic fluid volume had meconium stained liquor (Table 2). Induction of labor was done in 61 (69.32%) in reduced amniotic fluid

volume and 132 (25.19%) in normal amniotic fluid

**Table 1:** Amniotic fluid volume and number of patients

Amniotic fluid volume	Number of patients	%
Reduced ( AFI < 5 cm)	88	14.38
Normal (AFI > 5 cm)	524	85.62

volume, Total 67 (76.14%) patients in reduced amniotic fluid volume and 126 (24.05%) in normal amniotic fluid volume, had cesarean section out of which 36 (40.90%) women in reduced amniotic fluid volume and 41 (7.82%) women in normal amniotic fluid volume has fetal distress as indication of LSCS. LSCS for non reassuring fetal heart rate pattern was higher in women with reduced amniotic fluid volume. Birth weight <2.5 kg was in 73 (82.95%) women in reduced amniotic fluid volume and 155 (29.58%) women in normal amniotic fluid volume. An Apgar score <7 at 5 min was noticed in 51 (57.95%) women in reduced amniotic fluid volume and 155 (29.58%) women in normal amniotic fluid volume.

Non reassuring fetal heart rate pattern was present in a significant number of patients in reduced amniotic fluid volume 33 (37.50%) as compared to normal amniotic fluid volume 34 (6.49%). Most of the babies in reduced amniotic fluid volume were admitted to intensive care unit in reduced amniotic fluid volume, 46 (52.27%) as noticed in Table 3.

**Table 2:** Pregnancy outcome

	AFI<5 N=88	AFI>5 N=524
Meconium stained Liquor	25 (28.41%)	104(19.85%)
Induction of labour	61 (69.32%)	132 (25.19%)
Total LSCS	67 (76.14%)	126(24.05%)
APGAR Score At 5 min <7	51 (57.95%)	141 (26.91%)
Birth weight <2.5	73 (82.95%)	155 (29.58%)

**Table 3:** Other pregnancy outcome

	Reduced amniotic fluid volume	Normal amniotic fluid volume
Non-reactive NST	33 (37.50%)	34 (6.49%)
Admission to NICU	46(52.27%)	41(7.82%)

## Discussion

In this study pregnant women age was similar in both groups. Such findings were seen in study by casey et al., sowmya K et al., Chauhan et al. [4,5,6]. Our study showed more of cesarean section in reduced AFI, especially for fetal distress as like Chate

et al., [7] and Bhagat et al. [8]. On the other hand Voxman et al. gave information as there was no variation in cesarean rate depending on liquor quantity. Meconium in liquor was more in reduced liquor according to Loctaelli A et al. and bhagat M et al. [9]. Reduced blood flow in umbilical cord due to compression may lead to meconium passage [7,8] Baby birth weight was less in reduced liquor group as there were more early gestation deliveries compared to normal group. Chate P et al. [7] showed similar findings like ours. Krishna et al. gave information as IUGR and reduced liquor have direct relationship [10]. Like Chate P et al. [7]. In our study we observed more NICU admissions in reduced liquor group.

Lot of problems related to reduced liquor but proper monitoring of fetus if reduced liquor is noticed then the baby can be salvaged.

### Conclusion

In this study we gained information that, reduced AFI is good indicator for poor perinatal outcome. With proper monitoring we can decide, timely delivery in reduced AFI and can prevent subsequent problems.

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