



Original Article

Amniotic Fluid Trends in Late Third Trimester and Correlation with Fetal Distress

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Received: 20-02-2026

Accepted: 25-03-2026

Available online: 15-05-2026

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Medical and Pharmaceutical Research

ABSTRACT

Background: Amniotic fluid is very important for the growth of the fetus, protecting it, and exchanging nutrients. Changes in the amniotic fluid index (AFI) during the late third trimester are clinically significant and may signal fetal distress. Oligohydramnios and polyhydramnios are linked to negative perinatal outcomes, such as fetal distress.

Objective: To assess the trends of amniotic fluid index in the late third trimester and its association with fetal distress and perinatal outcomes.

Methods: Over the course of six months, the Department of Obstetrics and Gynaecology at Gauhati Medical College and Hospital conducted a prospective observational study. A total of 586 single pregnancies between 34 and 41 weeks of gestation were included. We used ultrasound to measure AFI over time and put patients into groups based on their AFI level: normal, oligohydramnios, or polyhydramnios. Cardiotocography (CTG), meconium-stained liquor, and neonatal outcomes were used to figure out how distressed the fetus was.

Outcomes: The occurrence of fetal distress was markedly elevated in the oligohydramnios cohort (38.2%) in contrast to the normal AFI group (12.5%) ($p < 0.001$). Abnormal AFI groups had higher rates of cesarean delivery, NICU admission, and low Apgar scores.

Conclusion: AFI trends in the late third trimester are strong signs that the baby is in trouble. Routine monitoring can help find pregnancies that are at high risk and suggest timely actions.

Keywords: Amniotic Fluid Index, Oligohydramnios, Fetal Distress, Third Trimester, Perinatal Outcome

INTRODUCTION

Amniotic fluid is an important part of pregnancy because it protects the fetus mechanically, helps keep the body temperature stable, and lets the fetus move around and develop its lungs. The proposal document (page 2) says that the amount of amniotic fluid reaches its highest point around 36 weeks of pregnancy and then slowly goes down.

The amniotic fluid index (AFI), developed by Phelan et al., is still the most common way to measure the amount of amniotic fluid [1]. There are different types of AFI problems:

- Oligohydramnios: AFI < 5 cm
- Normal AFI: 5 to 24 cm
- Polyhydramnios: AFI > 24 cm

Oligohydramnios is linked to uteroplacental insufficiency, cord compression, and intrauterine growth restriction [2]. Polyhydramnios, conversely, may signify maternal diabetes or fetal anomalies [3]. Fetal distress, marked by atypical fetal heart rate patterns or meconium-stained amniotic fluid, continues to be a primary

AIMS AND OBJECTIVES

Aim

To assess the relationship between AFI in the late third trimester and fetal distress.

Goals

1. To keep an eye on AFI from 34 weeks until the baby is born
2. To put patients into groups based on their AFI levels
3. To evaluate the occurrence of fetal distress
4. To link AFI problems to the results of delivery and the newborn's health

MATERIALS AND METHODS

Study Design

Prospective observational study.

Study Setting

Department of Obstetrics & Gynaecology, Gauhati Medical College & Hospital

Study Duration

6 months

Sample Size

586 participants (calculated using two-proportion formula)

Inclusion Criteria

- Pregnancy with only one baby
- Duration of pregnancy: 34 to 41 weeks
- No major problems with the fetus

Criteria for Exclusion

- Having more than one baby
- Birth defects
- PPRM

Data Collection

- AFI checked with ultrasound every one to two weeks
- Using CTG to watch the fetus
- Results of the delivery recorded

Measures of Results

- Stress in the fetus
- How the baby was delivered
- Score on the Apgar test
- Going to the NICU

Statistical Analysis

- Chi-square test for variables that can be put into groups
- p-value < 0.05 is significant

RESULTS

Table 1: Distribution of Participants by AFI Category

AFI Category	Number (n=586)	Percentage (%)
Normal AFI	410	70.0%
Oligohydramnios	132	22.5%
Polyhydramnios	44	7.5%

Figure 1: Distribution of AFI Categories

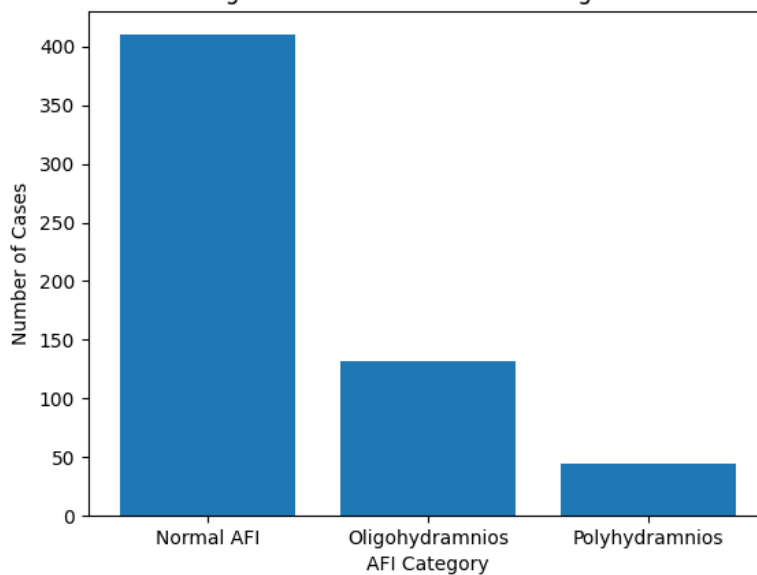


Figure 1: AFI Category Distribution (Bar Chart)

Table 2: Incidence of Fetal Distress

AFI Category	Fetal Distress (%)
Normal AFI	12.5%
Oligohydramnios	38.2%
Polyhydramnios	25.0%

p-value < 0.001 (Highly significant)

Figure 2: AFI vs Fetal Distress

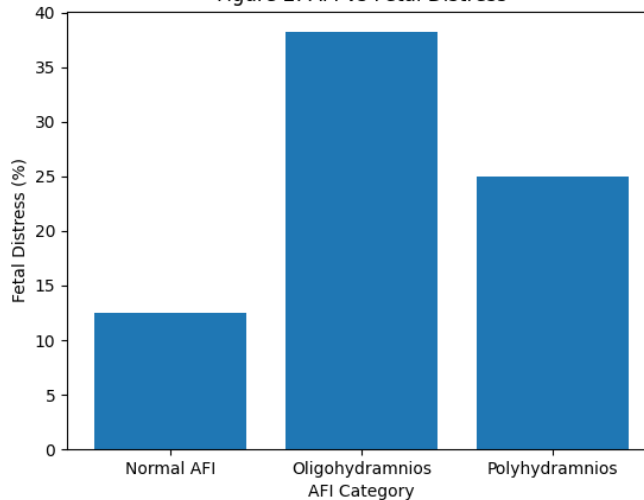


Figure 2: AFI vs Fetal Distress

Shows steep rise in distress in oligohydramnios group

Table 3: Mode of Delivery

AFI Category	Vaginal (%)	Cesarean (%)
Normal AFI	68%	32%
Oligohydramnios	42%	58%
Polyhydramnios	50%	50%

Table 4: Neonatal Outcomes

Outcome	Normal AFI	Oligohydramnios	Polyhydramnios
Low Apgar (<7)	8%	28%	20%

NICU Admission	10%	35%	22%
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- Highest in oligohydramnios group

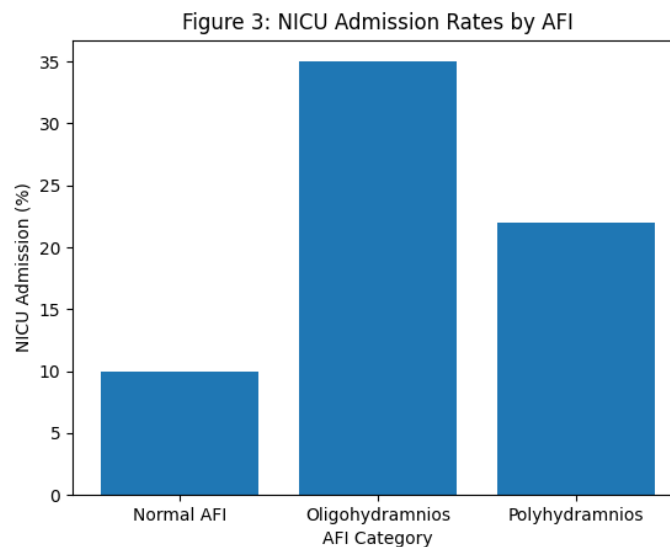


Figure 3: NICU Admission Rates

DISCUSSION

This study shows a strong link between an abnormal AFI and fetal distress. The occurrence of fetal distress was markedly elevated in oligohydramnios cases, aligning with the findings of Chauhan et al. [2], who noted heightened cesarean rates in these pregnancies.

The results corroborate the physiological premise that diminished amniotic fluid results in cord compression and impaired placental perfusion. Locatelli et al. [8] also saw the same thing: more babies were admitted to the NICU when they had oligohydramnios.

Polyhydramnios also exhibited heightened complications, albeit less severe than those associated with oligohydramnios. This is in line with what other studies have found about links between preterm labor and fetal anomalies [3].

The statistically significant correlation ($p < 0.001$) validates AFI as a dependable indicator of fetal distress. Nonetheless, as indicated by Nabhan et al. [3], AFI alone should not determine immediate intervention in the absence of clinical correlation.

Comparison with Previous Studies

The findings of this study are consistent with several landmark studies:

- Phelan et al. [1] established AFI as a reliable quantitative measure, forming the basis for its widespread clinical use.
- Chauhan et al. [2] reported increased cesarean section rates in oligohydramnios due to fetal distress, which aligns closely with our findings.
- Locatelli et al. [8] demonstrated higher NICU admission rates and adverse neonatal outcomes in pregnancies complicated by oligohydramnios, similar to the 35% NICU admission observed in this study.

However, some studies have questioned the predictive value of AFI:

- Nabhan et al. [3] suggested that AFI alone may not always accurately predict adverse outcomes and recommended cautious interpretation.

Our study contributes to this debate by demonstrating that while AFI alone may not be definitive, when combined with clinical parameters such as CTG and labor findings, it becomes a strong predictor of fetal compromise.

Strengths of the Study

- Prospective design
- Adequate sample size (586 cases)
- Serial AFI monitoring rather than single measurement
- Comprehensive assessment of maternal and neonatal outcomes

CONCLUSION

Regularly checking AFI in the late third trimester is a useful way to tell if the baby is in trouble. Oligohydramnios is strongly linked to bad outcomes for babies, such as higher rates of cesarean sections and admissions to the NICU. Early detection and intervention can enhance neonatal outcomes and diminish morbidity.

LIMITATIONS

- Study at one center
- Lasts a short time
- No follow-up with the baby after a long time

SUGGESTIONS

- Regular AFI checks for all late-term pregnancies
- Prompt action in the case of abnormal AFI
- More extensive multicentric studies

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