

## A study of perinatal outcome in patients with low Amniotic Fluid Index (AFI)

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**Abstract:** *Background:* The amniotic fluid that surrounds the fetus is a very essential component of normal intrauterine growth. It creates a physical space for the musculoskeletal development, promotes normal lung development & helps to avert compression of the umbilical cord. The importance of amniotic fluid volume as an indicator of fetal well being has made its assessment an important part of antenatal foetal surveillance. *Aims & Objectives:* In this study, the purpose of taking group of women with oligohydramnios beyond 37 weeks of gestation is because the etiology, management and the outcome is different in later onset oligohydramnios compared to early onset oligohydramnios. Thus this study is conducted to find out the value of AFI 5cm (oligohydramnios) on the perinatal outcome and maternal outcome pregnancies beyond 37 weeks of gestation. *Methods:* The hospital based, time bound, prospective study, was conducted on 200 subjects admitted to AMCH with an AFI<5cm, from Nov 2014 to Jun 2016. Singleton pregnancies with gestational age 37 to 40wks with intact membranes were included. Exclusion criteria being Multiple pregnancies, PROM, Gestational age <37>40 wks and IUDs. *Results:* A total of 200 cases of isolated oligohydramnios were assessed majority falling in the age group of 21-25 years. Primis with oligo were 48% NST was reactive in 62%. USG profile being normal in 80% and 20% abnormal. Out of these, 25% had vaginal delivery and 75% CS. Fetal distress (62%) being the major indication for CS. 58% of neonates had a mean birth wt of >2.5 kg, 38% had NICU admission. Perinatal mortality observed in 12%. *Conclusion:* Oligohydramnios is associated with LBW, low APGAR score and higher NICU admission. Pregnancy with isolated oligohydramnios is not associated with impaired fetal growth or an increased risk of adverse perinatal outcome and requires no aggressive treatment.

**Keywords:** Amniotic fluid, Oligohydramnios, Foetal distress, NICU admission.

### Introduction

The amniotic fluid that surrounds the fetus is a very essential component of normal intrauterine growth [1]. It creates a physical space for the musculoskeletal development, promotes normal lung development & helps to avert compression of the umbilical cord [2]. The amniotic fluid volume is the result of interaction of the maternal & foetal fluid balances; foetal surface of the placenta & fetal body surface and directly from the mother in the initial period of gestation [3].

Fetal veins, lung liquid secretion, fetal swallowing & intermembranous pathways contributing in the latter half. The AFV varies with each week of pregnancy [4]. From 20ml at 20wks, to 270ml at 28wks; plateauing till 39wks, after which it decreases. The average AFV in 3<sup>rd</sup> trimester is 700-800ml. Oligohydramnios is diagnosed when ultrasonographically the AFI is <5cm. It affects 3-5% pregnancies [5]. It can be

categorised as mild, moderate & severe oligohydramnios, when single deepest pocket of fluid without cord/fetal limbs measures <3/2/1cm respectively [6]. Oligohydramnios is found to be associated with increased frequency of maternal & fetal complications viz foetal distress, meconium staining, low apgar & neonatal resuscitation/nicu admission, but a poor predictor. It is often used as an indication for delivery [7]. Determination of AFI can be used as an adjunct to other fetal surveillance methods. Oligohydramnios characterized by low AFI may compromise fetal reserves and increases susceptibility to interauterine stresses and resultant foetal distress [8]. Oligohydramnios is associated with increased risk of meconium staining of AF, abnormal FHR tracing, operative intervention for fetal distress in labour, low APGAR score at birth and higher NICU admission rate [9].

**Aims:** To know the Obstetric outcome associated with oligohydramnios. To study the perinatal outcome of ultrasonographically detected oligohydramnios at 37 to 40 weeks of gestation.

**Material and Methods**

The 200 Patients admitted to the Department of OBG Al-Ameen Medical College and Hospital, Bijapur with gestational age 37 wks to 40 wks with low amniotic fluid index(AFI)<5cm were selected during the period from Nov 2014 to June 2016. The study subjects were assessed based on the daily NST and weekly Doppler. Based on the fetal wellbeing, decision as regards the continuation or termination of the pregnancy by the most appropriate route was taken.

**Study Design:** Hospital based, time bound, prospective study.

**Inclusion Criteria:**

- Gestational age 37wks-40wks
- Singleton gestation with cephalic presentation
- AFI<5cm
- Intact membranes

**Exclusion Criteria:**

- Multiple Pregnancy
- Intrauterine death of the fetus.
- Patients with ruptured membrane.
- Fetal anomalies.
- Gestational age <37wks
- Fetal malpresentations
- Polyhydramnios

**Statistical Methods Applied:** Both descriptive and inferential statistics were employed for data analysis.

**Results**

In this clinical study 200 cases admitted to AMCH, Bijapur with low AFI :<5cm, with GA 37-40 weeks were analysed for maternal and perinatal outcome. Detailed history and clinical examination was done. Phelan's method was used to obtain AFI - based on the inclusion and exclusion criteria the patients were followed till delivery. Pregnancy and perinatal outcomes were recorded. Majority of the patients were in the age group of 21-25 yrs, with mean age of incidence

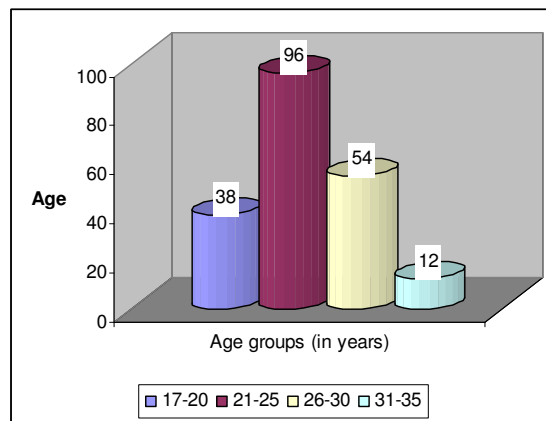
being 26. In this study, 30 (15%) were unbooked 150 (85%) were booked. Early detection and reference with timely intervention will improve the maternal and fetal outcome in cases of oligohydramnios.

The cases of oligohydramnios were diagnosed by clinical examination and confirmed by USG. Other investigations, like blood grouping and Rh typing, HIV, Hbsag were done. Diagnosis of decreased amniotic fluid volume on routine USG, requires close antepartum observation, to detect complication that may arise in pregnancy and delivery.

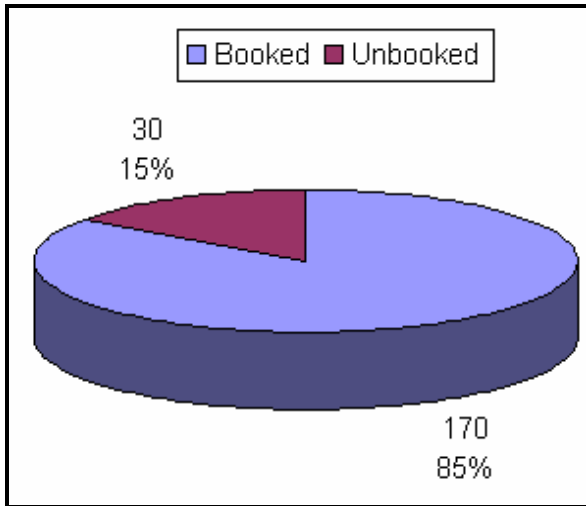
The time of diagnosis of the condition bears direct relationship to the fetal outcome. Patients in the study had majorly primary level of education, i.e. 80% of the total. Patients were recruited for the study irrespective of their parity, primis constituting 52% and mults 48%. 80% of the study population belonged to the lower SES.

A total of 200 cases of isolated oligohydramnios were assessed majority falling in the age group of 21-25 years. Primis with oligo were 48% NST was reactive in 62%. USG profile being normal in 80% and 20% abnormal. Out of these, 25% had vaginal delivery and 75% CS. Fetal distress (62%) being the major indication for CS. 58% of neonates had a mean birth wt of >2.5 kg, 38% had NICU admission. Perinatal mortality observed in 12%.

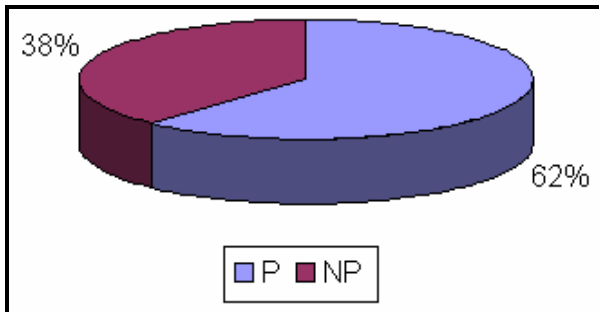
**Fig-1:** Distribution of the patients by age groups



**Fig-2:** Distribution of the patients by booked / unbooked status

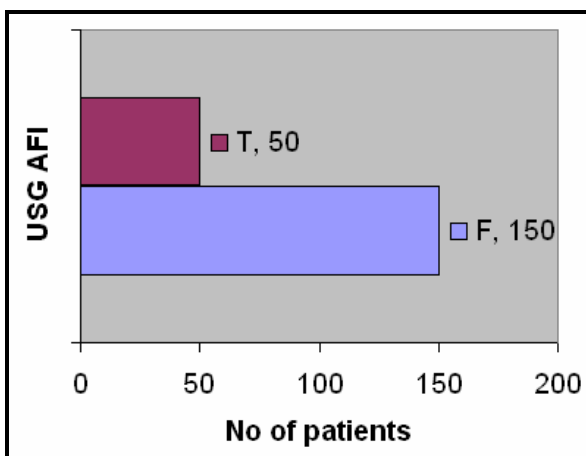


**Fig-3:** Distribution of the patients by non stress test

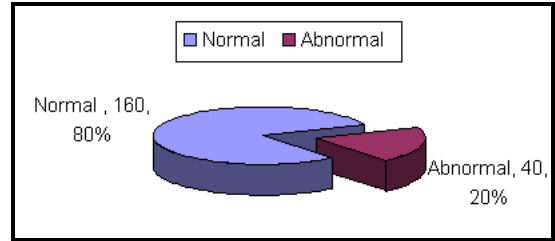


Majority of the sample neonates were reactive in NST to the extent of 62% and remaining 38% of them were non reactive. Significantly we find more neonate were reactive.

**Fig-4:** Distribution of the patients by USG AFI

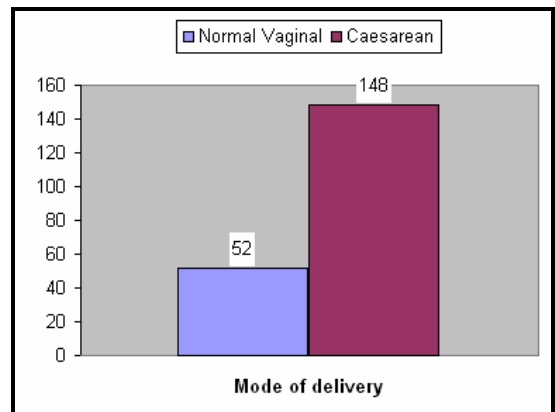


**Fig-5:** Distribution of the patients by Doppler test



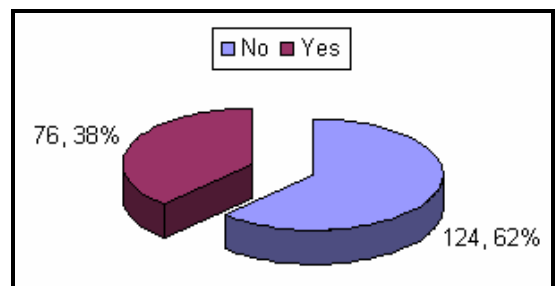
Of the 200 patients, majority of them had normal Doppler (80.0%) and remaining 20.0% of them had abnormal Doppler. Significantly we find more of normal Doppler (Chi-Square=72.0; p=.000).

**Fig-6:** Distribution of the patients by mode of delivery

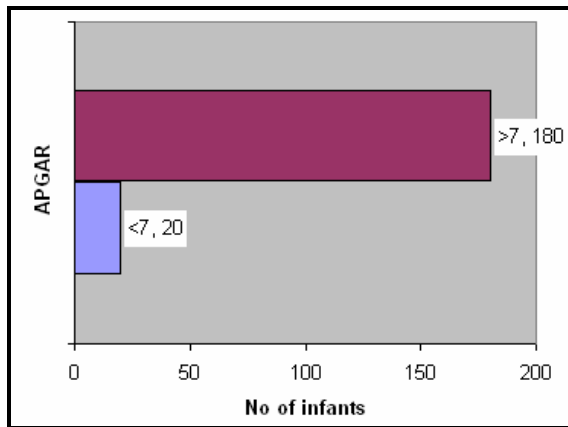


Majority of the deliveries were found to be caesarean to the extent of 74.0% and remaining 26.0% of them were normal deliveries. Significantly we find higher number of caesarean sections than normal deliveries (Chi=Square=46.08; p=.000).

**Fig-7:** Distribution of the infants by NICU admission



A low percentage of babies were admitted to NICU with 38.0% and majority of the babies were not admitted to NICU (62.0%), which was found to be statistically significant.

**Fig-8:** Distribution of the infants by APGAR score

A large majority of the infants were observed with >7 APGAR scores (90.0%). Only 10.0% of the infants were observed with <7 APGAR scores. Significantly we find more infants with >7 APGAR scores.

### Discussion

In this clinical study 200 cases admitted to AMCH, Bijapur with low AFI: < 5cm, with GA 37-40 weeks were analysed for maternal and perinatal outcome. Detailed history and clinical examination was done. Phelan's method was used to obtain AFI-based on the inclusion and exclusion criteria the patients were followed till delivery. Pregnancy and perinatal outcomes were recorded. Majority of the patients were in the age group of 21-25 yrs, with mean age of incidence being 24.16. In this study, 30 (15%) were unbooked 150 (85%) were booked. Early detection and reference with timely intervention will improve the maternal and fetal outcome in cases of oligohydramnios.

The cases of oligohydramnios were diagnosed by clinical examination and confirmed by USG. Other investigations, like blood grouping and Rh typing, HIV, HbsAg were done. Diagnosis of decreased amniotic fluid volume on routine USG requires close antepartum observation, to detect complication that may arise in pregnancy and delivery. The time of diagnosis of the condition bears direct relationship to the fetal outcome. Patients in the study had majorly primary level of education, i.e. 80% of the total. Patients were recruited for the study irrespective of their parity, primis constituting 52% and mults 48%. 80% of the study population belonged to the lower SES.

In the present study 126 out of 200 were diagnosed at term; 39-40 weeks of gestation. NST was done; being reactive in 62% and non reactive in 38%. USG was done; AFI was determined by the Phelan's four quadrant technique. An AFI of 4-5 cm was detected in 160 cases and <3 in 40 cases Doppler studies were done on the umbilical artery, where in S/D ratio, End diastolic flow and Pulsatility index were assessed. The respective parameters gave a normal profile in 160 out of 200 cases.

In this study no maternal mortality was noted; but decreased amniotic fluid was associated with an increased rate of cesarean delivery of nearly 75% for fetal distress (66%) and low apgar (10%) majorly in the patients with an AFI of <3cm than those with an AFI of 4-5 cm. The babies with birth weight <2.5 kg constituted 42% of the study population with nearly 38% requiring NICU admission for RDS (10%) MAS (20%) and VLBW (8%). Perinatal mortality rate was 12% Good NICU set up reduces the perinatal mortality and morbidity. In our study mean age at delivery is 38 weeks. No aggressive intervention is needed as long as fetal surveillance reports are normal and can be managed conservatively till term. Oligohydramnios characterized by low AFI may compromise fetal reserves and increases susceptibility to intrauterine stresses and resultant fetal distress. Oligo is associated with increased risk of meconium staining of AF, abnormal FHR tracing, operative intervention for fetal distress in labor, low apgar score at birth and higher NICU admission rate.

Sarno et al [10]. Noted a significantly higher rate of fetal distress and low apgar score in women with AFI 5 cm. This is reported to be due to head and cord compression. Golan et al. [11] reported a low apgar score at 5 minutes in 4.6% babies, in contrast to a figure of 12% noted by us. This difference in the rates observed is because of better intrapartum fetal assessment facilities available in developed nations. They concluded that liberal use of amnio infusion in women diagnosed with oligohydramnios might have resulted in improved outcomes which were not seen in previous studies. Desai et al [1]

found an increase in variable decelerations in women with low AFI which was statistically of just borderline significance. Casey et al. [12] found respiratory distress in 3.4% of neonates at birth in contrast to 6% as noted by us.

Oligohydramnios has been recognized as a clinical hallmark of impending severe perinatal compromise. We concluded 10% perinatal deaths, whereas Casey et al [12] reported 6.4% perinatal deaths. Ja-Young et al. [13], in a recent study have concluded that in the borderline AFI group, the presence of abnormal dorsal velocimetry measurement was related to adverse perinatal outcomes and mandates closer antenatal surveillance.

### Conclusion

Oligohydramnios is associated with a high rate of pregnancy complications and increased perinatal morbidity and mortality. We believe that AFI assessed antepartum or intrapartum would help to identify women who need increased antepartum surveillance for pregnancy complications and as such women should be cared for in a unit capable of managing such complications effectively.

Oligohydramnios is associated with LBW, low Apgar score and higher NICU admission. Pregnancy with isolated oligohydramnios is not associated with impaired fetal growth or an increased risk of adverse perinatal outcome and requires no aggressive treatment. The study showed Majority belonged to the 21-25yr age group.85% were booked cases.80% belonged to the low SES. Primis with oligo were 48%.63% fell in the 39-40wks POG.NST was reactive in 62%.USG profile was normal in 80% of the subjects.CS was the mode of delivery (75%) with fetal distress being the major cause (62%)Perinatal morbidity assessed by low APGAR score in 10%,LBW of <2.5kg in 42% and NICU admission in 38%.Perinatal mortality of 12% was noted.

### Summary

The clinical study was conducted to know the fetomaternal outcome in pregnancies with low liquor volume. Oligohydramnios is associated with LBW, low Apgar score and higher NICU admission. The study shows that isolated oligohydramnios had no adverse perinatal outcome.

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