

## INFLUENCE OF AMNIOTIC FLUID INDEX & PLACENTAL GRADING ON PERINATAL OUTCOME

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### INTRODUCTION

Modern obstetrics is concerned with the health and well being of both mother and unborn child. Recognition of a foetus at risk for death or damage in utero, quantifying the risk, balancing the foetal risk against the risk of neonatal complications from immaturity and determining the optimal time and mode of interventions are the cornerstones of modern perinatal medicine.<sup>[1]</sup> Alterations in amniotic fluid volume, especially decreased amniotic fluid volume (oligohydramnios) have classically been considered as an indicator of poor perinatal outcome.<sup>[2,3]</sup> The semiquantitative method of calculating an amniotic fluid index (AFI) by using ultrasound to measure the sum of the

deepest pockets of amniotic fluid in the 4 quadrants of the maternal abdomen is the most common method of quantifying amniotic fluid volume.<sup>[2,3]</sup>

Amniotic fluid volume or quantification is one of the most important component of intrapartum monitoring tool especially in the 3<sup>rd</sup> trimester of gestation. It provides protective cushioning media for growing foetus and prevents any mechanical & biological injury to it.<sup>[4]</sup> The values of amniotic fluid index between 8 & 25 are considered to be normal, 5-8 low normal and less than 5 oligohydramnios. An amniotic fluid index >25 is considered as polyhydramnios. Median amniotic fluid index value is approximately 14 from week 20 to week 35. At values less than 5 there is higher incidence of perinatal morbidity & mortality and many a time immediate delivery is the only way out. Since, these disorders of liquor amnii has a significant impact on pregnancy and fetus, it prompted us to carry out this study with sincere efforts to find out its effect on pregnancy outcome.

The placenta is essential to fetal well-being, growth and development. It can be demonstrated reliably and accurately by ultrasound. The association of ultrasonically detectable placental changes with increasing gestational age was first reported by Winsberg<sup>[5]</sup>, but it was Granum *et al.*<sup>[6]</sup> who introduced a grading system based on the ultrasonographic appearance of placentas. They graded placentas from 0 (Immature) to III (mature) on the basis of changes in the appearance of the chorionic plate, placental structure and basal layer. Classification of placenta is a physiological phenomenon which occurs throughout pregnancy. It has been divided into grades according to sonographic echotexture.

**Grade 0:** The placental tissue and the basal plate are homogeneous without the presence of linear highly reflective foci. The chorionic plate is smooth and well defined. Late first trimester early second trimester (10-16wks).

**Grade I:** The placental tissue contains a few linear highly reflective areas parallel to the basal plate, which remains unchanged. The chorionic plate presents subtle undulations. Mid second trimester early third trimester (18-29wks).

**Grade II:** The placental tissue contains randomly dispersed echoes and is divided by comma like reflective structures continuous with the chorionic plate. The marked indentations of the chorionic plate do not reach the basal plate, which is well defined by small linear highly reflective areas. Late third trimester (30wks to delivery).

**Grade III:** The placental tissue is divided into compartments containing central echo free areas. The chorionic plate indentation reaches the basal plate, which contains almost confluent, very reflective areas. 39 wks to post date.

### **AIM**

To study the influence of antenatal surveillance with AFI & placental grading on perinatal outcome.

### **OBJECTIVES**

1. To determine the amniotic fluid index
2. To determine the placental grading
3. To determine the effect of amniotic fluid index & placental grading on perinatal outcome.

## MATERIALS AND METHODS

### Types of study - prospective cohort study

By using purposive sampling we had selected 200 patients having gestational age between 34 - 41 weeks from AVBRH DMIMSU, sawangi, WARDHA during April 2018 to October 2018.

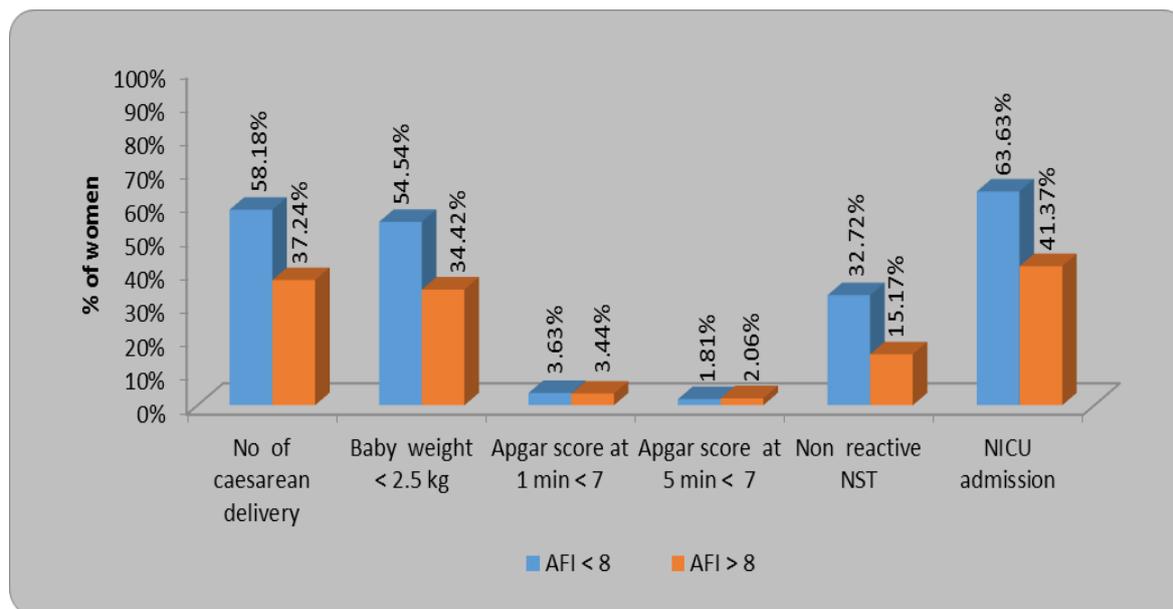
All assessments was done soon after admission.

- 1) Age, parity, history of previous pregnancy (polyhydraminos or oligohydraminos), any congenital anomalies to the previous baby, medical history, pelvic & physical examination was noted.
- 2) All the cases subjected to ultrasonography to see for placental maturity, AFI, congenital anomalies.
- 3) AFI was determined in all patients using four quadrants technique. Placental grading was done. Patients was divided into two groups. AFI<8 Oligohydraminos and AFI>8 normal group. Placental gd2 was compared with gd 3.
- 4) Outcomes was measured in terms of fetal distress, mode of delivery, caesarean section rate, birth weight, apgar score, admission to NICU. Inclusion criteria were women with singleton, non-anomalous foetus with intact membrane at the time of admission. exclusion criteria were women with multiple pregnancy, Known maternal medical problems, with known fetal or chromosomal anomaly, RH incompatibility, premature rupture of membranes, Intra uterine death.

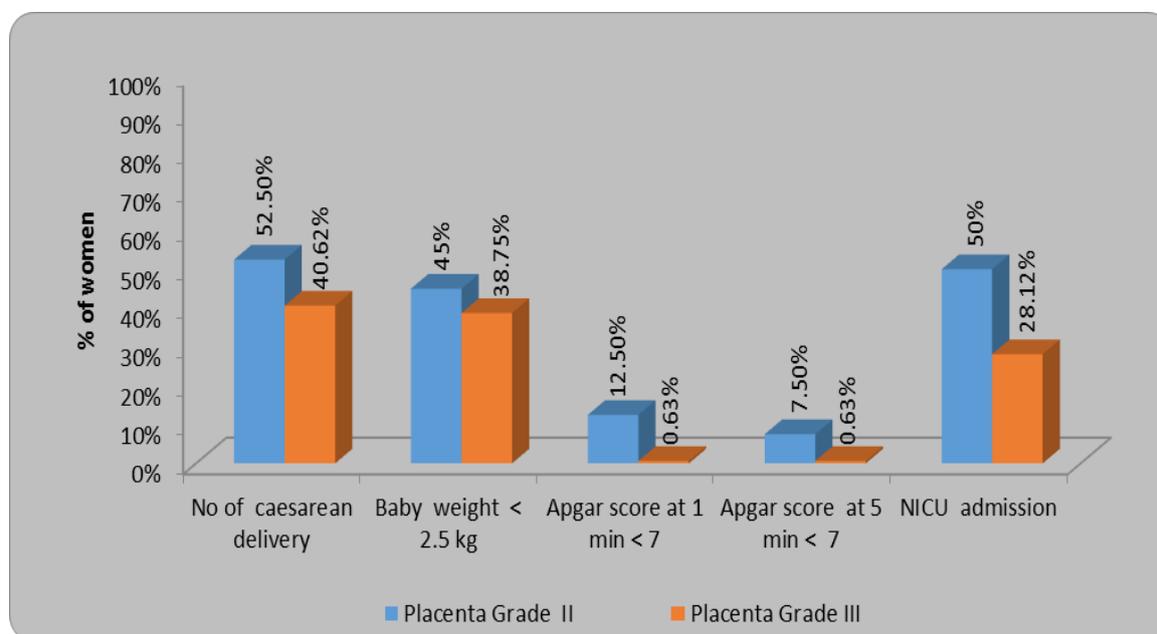
Statistical analysis was be done by using descriptive & inferential statistics using chi- square test, z test for difference between two means and software using analysis will be SPSS22.0 version & graph pad presume 6.0 version. P<0.05 was considered as level of significance.

## RESULTS

	AFI < 8 (n=55)	AFI > 8 (n= 145)	p-value
No of caesarean delivery	32(58.18%)	54 (37.24%)	8.84, p=0.002, S
Baby weight < 2.5 kg	30 (54.54%)	50(34.42%)	8.11, p=0.004, S
Apgar score at 1 min < 7	2 (3.63%)	5 (3.44%)	0.14, p=0.70, NS
Apgar score at 5 min < 7	1 (1.81%)	3 (2.06%)	0.00, p=1.00, NS
Non reactive NST	18(32.72%)	22 (15.17%)	8.88, p=0.002, S
NICU admission	35 (63.63%)	60 (41.37%)	10.61, p=0.001, S



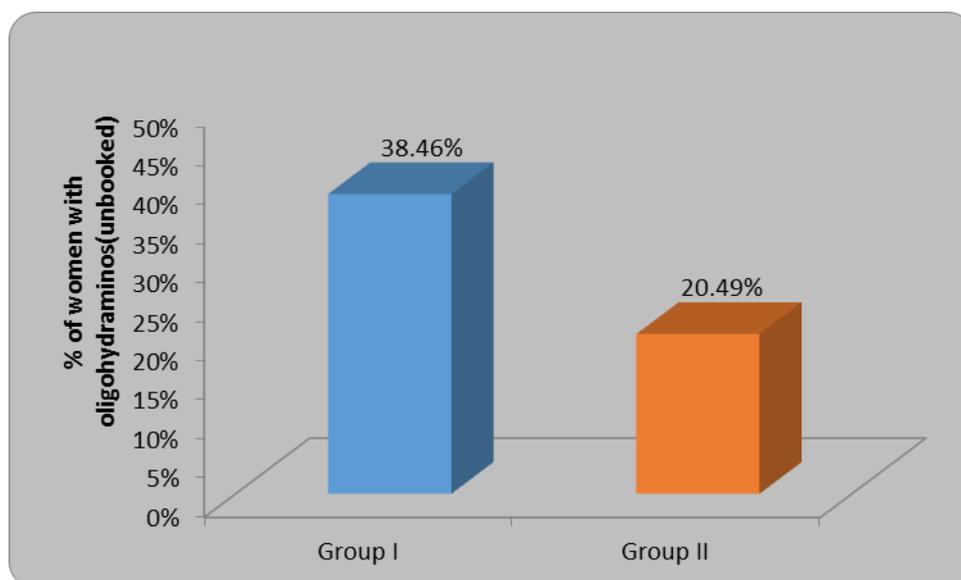
	Placenta Grade II (n=40)	Placenta Grade III (n=160)	p- value
No of caesarean delivery	21 (52.5%)	65 (40.62%)	2.89, p=0.089, NS
Baby weight < 2.5 kg	18 (45%)	62 (38.75%)	0.73, p=0.39, NS
Apgar score at 1 min < 7	5 (12.5 %)	1 (0.63%)	11.06, p= 0.009, S
Apgar score at 5 min < 7	3 (7.5 %)	1 (0.63%)	5.70, p=0.017, S
NICU admission	20 (50%)	45(28.12%)	10.17, p= 0.001, S



Out of 200 women 78(39%) was unbooked. In unbooked cases 30 had oligohydraminos out of 78 (38.46%) which was more as compared to booked cases in which 25 had oligohydraminos out of 122 (20.49%). 200 women were divided in 2 study groups. 55 women had AFI < 8 which was considered as group 1, 145 women with AFI > 8 was

considered as group 2. perinatal outcome were measured in both groups. caesarean section was performed in 32 (58.18%) in group 1 as compared to 54 (37.24%) in group 2 [ $p= 0.002$ ]. caesarean section for non reactive NST (foetal distress) was higher in group 1 (56.25%) as compared to group 2 (40.7%). Birth weight  $< 2.5$  kg was found in 30 (54.54%) in group 1 as compared to 50 (34.42%) in group 2 [ $p=0.004$ ]. Two baby had Apgar score  $< 7$  at 1 minute in group 1 (3.63%) as compared to 5 (3.44%) baby in group 2 [ $p=0.70$ ]. one baby had apgar score  $< 7$  at 5 minutes in group 1 (1.81%) as compared to 3 in group 2 (2.06%) [ $p=1.00$ ]. 35 newborns were admitted in nicu in group 1(63.63%) as compared to 60 (41.37%) in group 2.[ $p= 0.001$ ].

Out of 200 women 40 women with grade 2 placenta was considered as group 3 & 160 women with grade 3 placenta was considered as group 4. perinatal outcome were measured in both groups. caesarean section was performed in 21 (52.5%) in group 3 as compared to 65 (40.62%) in group 4 [ $p= 0.089$ ]. Birth weight  $< 2.5$  kg was found in 18 (45%) in group 3 as compared to 62 (38.75%) in group 4 [ $p=0.39$ ]. 5 baby had Apgar score  $< 7$  at 1 minute in group 3 (12.5%) as compared to 1 (0.625%) baby in group 4 [ $p=0.009$ ]. 3 baby had apgar score  $< 7$  at 5 minutes in group 3(7.5%) as compared to 1 in group 4(.0625%) [ $p=0.017$ ]. 20newborns were admitted in NICU in group 3(50%) as compared to 45 (28.12%) in group 4.[ $p= 0.001$ ].



## DISCUSSION

In the present study caesarean section rate was higher in group 1 as compared to group 2 (58.18% vs 37.24%) & the difference was statistically significant [ $p=0.002$ ] caesarean section

for nonreactive NST was also higher in oligohydramnios group as compared to normal group (56.25 vs 40.7%).

A similar study done in 2011 by author Meghabhagat and Indu Chawla at Dr Ram Manohar Lohia Hospital, New Delhi, India.<sup>[7]</sup> They found that antepartum oligohydramnios was associated with increased caesarean delivery particularly for fetal distress.

In our study birth weight < 2.5 kg was more in oligohydramnios group as compared to normal group (54.54% vs 34.42%) and the difference was statistically significant [p=0.004].

In our study there was no more difference in Apgar score < 7 at 1 minute & 5 minute in both groups (3.63% vs 3.44%) [p=0.70] & (1.81% vs 2.06%) [p=1.00] respectively and the difference was statistically not significant.

NICU admission rates was more in group 1 (oligohydramnios AFI < 8) as compared to group 2 (63.63% vs 41.37%) & the difference was statistically significant. [p=0.001]. A study done by Vidya A. Thobbi and Sheema Sabahath at AI Ameen Medical College and Hospital, Vijaypur, Karnataka, India in 2016 suggested that oligohydramnios is associated with low birth weight, higher NICU admissions & low apgar score.<sup>[8]</sup>

A study done by Dr.Kondepagu Madhavi, Dr. P. Chandrashekhar Rao at Guntur Medical College, Guntur, Andhra Pradesh, India suggested that oligohydramnios are associated with adverse perinatal outcomes in terms of fetal distress, increased caesarean section rates, low birth weight, low Apgar scores, NICU admissions, perinatal morbidity & mortality.<sup>[9]</sup>

A similar study done by Panda S, Jayalakshmi M, Shashi Kumari G, Mahalakshmi G, Srujan Y, Anusha V. at Maharajah Institute of Medical sciences, Vizianagaram, A.P. in 2015 concluded that Oligoamnios has a significant correlation with adverse perinatal outcome in terms of non-reactive CTG, cesarean section rate due to fetal distress, low birth weight, APGAR score <7 and NICU admission.<sup>[10]</sup> -----In our study there was not much difference in caesarean delivery rates in group 3 & 4 (52.5% vs 40.62%) and the difference was statistically not significant [p=0.089].

In this study there was no more difference in birth of low birth weight baby (< 2.5 kg) in group 3 & 4 (45% vs 38.75%) and the difference was statistically not significant. [p= 0.39].

In our study the 1 minute Apgar score  $< 7$  was in 12.5% baby in group 3 whereas only 0.625% baby in group 4 had 1 minute Apgar score  $< 7$  & the difference was statistically significant. [p=0.009]. Baby with 5 minute Apgar score  $< 7$  was more in group 3 as compared to group 4 (7.5% vs 0.625%) & the difference was statistically significant. [p=0.017].

NICU admission rates was more in group 3 as compared to group 4 (50% vs 28.12%) & the difference was statistically significant. [p=0.001].

A study done by Preeti Sharma and Sanjeev Sharma in 2012 at N.S.C.B. Medical college, Jabalpur suggested that grade 3 placenta definitely correlated with good pulmonary activity as seen by good Apgar score.<sup>[11]</sup>

A study done by Goyal M, Sharma S, Saini A.S, Aggarwal A. at department of obstetrics & gynaecology, SGRP institute of medical science & research Vallah, Amritsar in 2013 suggested similar incidence of fetal distress in grade 2 & grade 3 placenta.<sup>[12]</sup>

## CONCLUSIONS

In our study antepartum oligohydramnios was associated with adverse perinatal outcome in terms of increased caesarean delivery, increased low birth weight babies & more NICU admissions ----- . However there was no correlation of antepartum oligohydramnios with 1 min & 5 min apgar scores.

Our study also suggested that grade 3 placenta had good perinatal outcome in terms of Apgar score at 1 min & 5 min and low NICU admissions. No significant correlation found between grade 2 & grade 3 placenta in terms of caesarean delivery rates & low birth weight babies.

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