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Original Research Article

## Clinico-radiological evaluation of oligohydramnios with special reference to pregnancy outcome

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### ABSTRACT

**Background:** Oligohydramnios is defined as amniotic fluid index of less than 5cm. It is thought to be associated with increased fetal and maternal morbidity. Studies are not clear whether the adverse perinatal outcome merely reflects the sequel of other conditions or if, reduced amniotic fluid volume itself contributes to adverse outcomes.

**Methods:** A total of 150 pregnant women with gestational age >34 weeks having clinically diagnosed oligohydramnios were enrolled in this observational prospective clinical study, during the study period of 12 months, 1 June 2020 to 31 May 2021. Patients were first subjected to ultrasonographic AFI estimation, divided into two groups (oligohydramnios and borderline AFI) and then followed up for maternal and fetal outcome. Data was statistically analyzed.

**Results:** A total 72.66% had AFI less than 5 cm. 97 (64.66%) were primigravida. 68% were prepared for Caesarean section irrespective of gestational period, the most common indication being fetal distress. 66.66% babies had good APGAR score at 1 minute after birth. 41.06% delivered babies who required NICU admission, although only 2% neonatal deaths were recorded.

**Conclusions:** Our study shows that isolated decreased AFI after 34 weeks of gestation is associated with satisfactory perinatal outcome. Both groups in the study, when compared statistically, were relatively similar in their pregnancy outcome. Significant association was found between oligohydramnios and increased rate of caesarean section, NICU admission and abnormal fetal heart rate tracing.

**Keywords:** Oligohydramnios, AFI, Caesarean section, NICU admission, Meconium-stained liquor, Perinatal outcome

### INTRODUCTION

Pregnancy is a normal physiological process, which should ideally end with the welcoming of a new and healthy life in the family. Maternal health and neonatal outcome are the two most important indicators of health care facilities and development of a country. Amniotic fluid provides numerous benefits to the foetus. A decreased amniotic fluid volume is frequently one of the first clues to an underlying fetal abnormality or maternal disease state. Progressive improvement in the ultrasound

technique has made it possible to assess the amniotic fluid volume fairly accurate.

Oligohydramnios is defined as amniotic fluid index (AFI) of less than 5cm.<sup>1</sup> The prevalence depends largely upon the definition and criteria used for oligohydramnios and the population studies.<sup>2</sup> It is thought to be associated with increased fetal and maternal morbidities. Isolated oligohydramnios may occur in late pregnancy in patients with no other high-risk factors associated with oligohydramnios and may be incidentally diagnosed on

routine ultrasound. Perinatal morbidity and mortality is due to high risk of Caesarean deliveries for mother due to fetal distress, low APGAR score, meconium aspiration syndrome and congenital abnormalities.<sup>3</sup> Studies have shown that it is not clear whether the adverse perinatal outcome merely reflects the sequel of other conditions or if, reduced amniotic fluid volume itself contributes to adverse outcomes.

**METHODS**

The present study was carried out in the department of obstetrics and gynecology at Jorhat medical college and Hospital, Assam for a period of 1 year, 01 June 2020 to 31 May 2021. This study is an observational prospective clinical study. A total of 150 admitted women with singleton pregnancy at gestational age more than 34 weeks having clinically diagnosed oligohydramnios were enrolled in the study. Pertinent history relating to age, parity, gestational age, socio-economic status, educational status and booking status were recorded on a computer generated proforma for each woman.

**Inclusion criteria**

Clinically diagnosed cases of oligohydramnios having gestational age more than 34 weeks were included in the study.

**Exclusion criteria**

Non-compliant patients and those who refrain from giving consent, gestational age less than 34 weeks, multifetal pregnancy, history of draining per vagina, antepartum haemorrhage hypertensive disorders of pregnancy, fetal congenital anomalies and intrauterine fetal death cases were excluded from the study.

**Procedure**

Patients were explained the procedure to be performed, written informed consent was taken and the relevant obstetrical and gynecological history was also taken. All the patients in the study were subjected to USG guided AFI estimation using Phelan’s 4 quadrant method.<sup>4</sup> All women included in the study were followed up and observed for various perinatal outcome both in mother and foetus such as mode of termination of pregnancy, birth weight, fetal distress, meconium staining, APGAR score, NICU admission etc. This study included two groups. The first group included pregnant women at gestational age 34 weeks and above with oligohydramnios i.e. AFI <5 cm. The second group included borderline oligohydramnios with AFI 5-8 cm.

**Statistical methods and analysis**

Descriptive statistical analysis has been carried out in this study. Chi-square, independent T-test and Fisher Exact test have been used. Probability value less than 5% was

considered statistically significant (p<0.05). The Statistical software namely IBM SPSS version 20 was used for the analysis of the data and Microsoft Word and excel have been used to generate graphs and tables.

**RESULTS**

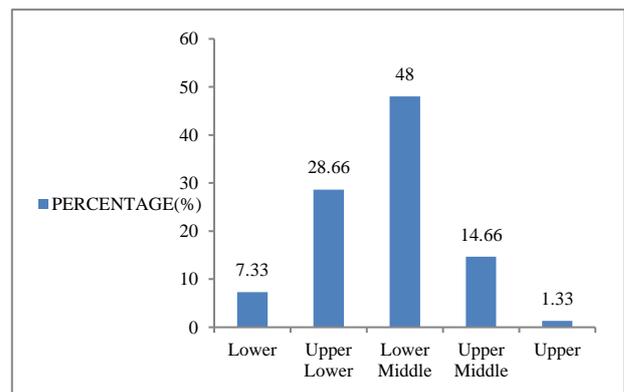
Demographic data of patients including maternal age distribution, educational status and socioeconomic status (measured by Modified Kuppuswamy scale) are shown in (Tables 1-2, Figure 1) respectively. Out of 150 patients enrolled for the study, 64.66% were primigravida as shown in (Table 3).

**Table 1: Maternal age distribution.**

Maternal age group (years)	N	%
<20	17	11.33
21-25	88	58.66
26-30	26	17.33
31-35	17	11.33
>35	2	1.33
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 2: Educational status.**

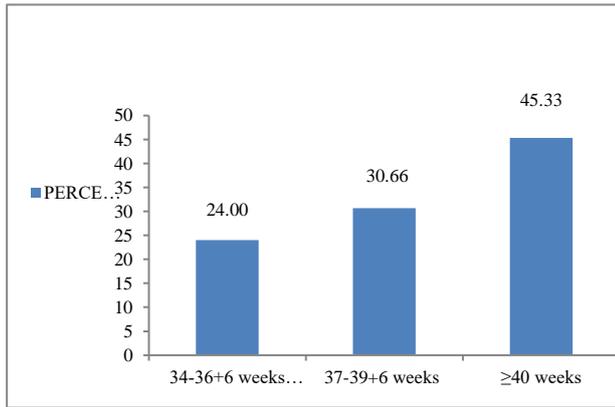
Education	N	%
Illiterate	37	24.66
Lower primary	49	32.66
High school	45	30.00
Higher secondary	7	4.66
Graduate	12	8.00
<b>Total</b>	<b>150</b>	<b>100</b>



**Figure 1: Socioeconomic status.**

Only 42 (28%) patients were booked pregnancy cases in the study. 45.33% were of gestational age more than equal to 40 weeks as shown in (Figure 2). After doing ultrasonographic assessment of AFI by Phelan’s Method, out of 150 patients, 109 (72.66%) had AFI less than 5 cm. Borderline oligohydramnios was seen in 41 (27.33%) patients as described in (Table 4). 68% (102) of the patients had their mode of delivery by Caesarean Section

as shown in (Figure 3). 22.66% cases had meconium staining, out of which 11 cases had thickly stained liquor.



**Figure 2: Gestational age distribution.**

Majority of babies (61.33%) weighed in the range of 2.5 to 3.5 kg. 50 babies (33.33%) had poor APGAR score at 1 minute. Only 5 babies (3.33%) had poor APGAR score after 5min, all of them were given NICU admission. 62 babies were given NICU admission for various conditions as described in (Figure 4). 29 (46.77%) were admitted for Post resuscitation care whereas 6 (9.67%) were Preterm. Respiratory distress (tachypnea/grunting) was seen in 11 babies who were admitted, 10 babies admitted for neonatal jaundice and another 6 babies were admitted for other reasons. Of the 150 babies, only 3 (2%) had perinatal deaths. Incidentally, all 3 babies were low birth weight (LBW). There was no reported case of maternal mortality in the perinatal period.

**Table 3: Distribution of patients according to gravida.**

Gravida	N	%
Primigravida	97	64.66
Multigravida	53	35.33
<b>Total</b>	<b>150</b>	<b>100</b>

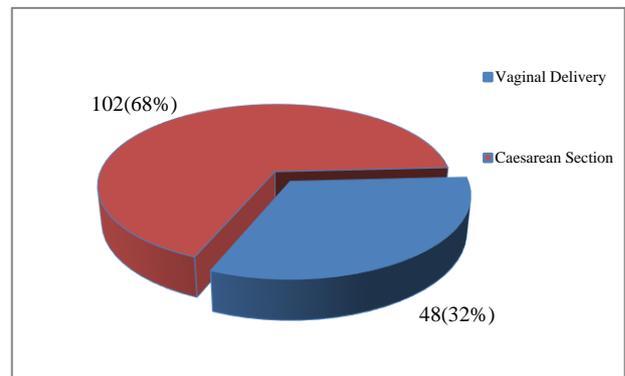
**Table 4: Amniotic fluid index.**

Amniotic fluid index (cm)	N	%
>5	109	72.66
5-8	41	27.33
<b>Total</b>	<b>150</b>	<b>100</b>

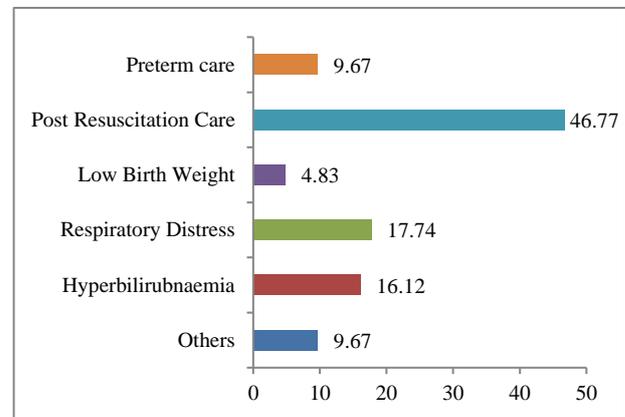
**DISCUSSION**

The study showed that 64.66% patients with decreased AFI were primigravida. Garmel et al study observed that 67% of women with oligohydramnios were primigravida, and Charu et al study also observed that 60% of women were primigravida.<sup>5,6</sup> The rate of LSCS was significantly higher (68%) compared to national average,17.2% in 2015-16.<sup>7</sup> The increase was not precisely due to less AFI but presumably due to higher rate of fetal distress.

Comparison is made with Jandial et al who noticed among the induced patients 44% women had normal vaginal delivery and 56% underwent caesarean section, out of which 42% had fetal distress.<sup>6</sup> LSCS patients had a mean gestational age of 39.2±2.63 weeks. And patients delivering vaginally had a mean gestational age of 38.22±2.77 weeks. It was observed in our study, when comparing gestational age and LSCS mode of delivery, p value=0.037 was found, which implied significance. It implied that there was association of increasing gestational age with LSCS delivery. While comparing the LSCS mode of delivery with both the groups (oligohydramnios and borderline) in our study, it was found to be insignificant, p value=0.136. It implied that the two groups had almost similar outcome irrespective of the AFI value.



**Figure 3: Mode of delivery.**



**Figure 4: Reason for NICU admission.**

There was no significant association between decreased AFI and meconium-stained liquor in this study, p value=0.194. Meconium-stained liquor was found in 21.1% of women with oligohydramnios as compared to 26.82% of women with borderline AFI by present study. It was found in this study that the incidence of LBW is almost similar in both groups, as 30.43% (35 LBW out of 115 cases) in oligohydramnios group and 28.57%(10 out of 35) in borderline AFI group. It is not statistically significant, p value=0.279. Reddy et al found that 59.4% patients with isolated oligohydramnios delivered LBW

(includes both LBW and VLBW) babies.<sup>8</sup> In contrast, Conway et al found no significant difference of birth weight between the isolated oligohydramnios and control group with 183 subjects in each group.<sup>9</sup> 33.33% babies had poor APGAR score at 1 min and 3.33% babies had poor APGAR score at 5 min. Golan et al reported a low APGAR score at 5 minutes in 4.6% babies.<sup>10</sup> There was not much relationship between less AFI and APGAR at 1 minute,  $p$  value=0.187 in 34 to 36<sup>6/7</sup> weeks,  $p$  value=0.358 in 37 to 39<sup>6/7</sup> weeks and  $p$  value=0.119 in >40 weeks. The APGAR at 5 minutes also has no significant association with less AFI,  $p$  value=0.089 in 34 to 36<sup>6/7</sup> weeks,  $p$  value=0.150 in 37 to 39<sup>6/7</sup> weeks &  $p$  value=0.299 in >40 weeks. There is an increased incidence of NICU admission noted in the oligohydramnios group (45.87%) as compared to Borderline AFI group (29.26%). NICU admission was found to be 18.5% by Garmel et al in gestational age 17 to 37 weeks, and by Jandial et al (16%) in gestational age beyond 34 weeks.<sup>5,6</sup> Higher incidence of NICU admission in the group with oligohydramnios when compared to the borderline oligohydramnios group was seen, but 2% neonatal deaths indicated acceptable neonatal outcome. Conway et al found that neonatal outcome did not differ between isolated oligohydramnios and control groups.<sup>9</sup>

#### **Limitations**

Smaller duration of the study and reduced sample size due to COVID-19 pandemic were found to be the limitations in this study.

#### **CONCLUSION**

This study concludes that isolated decreased AFI after 34 weeks of gestation is associated with satisfactory perinatal outcome. Significant association was found between oligohydramnios and increased rate of caesarean section, NICU admission and abnormal fetal heart rate tracing. There was no significant relation between oligohydramnios and variables like occurrence of meconium-stained liquor, low APGAR score (less than 7/10) at 1 & 5 minutes and neonatal outcome. Both groups in the study i.e. oligohydramnios and borderline AFI with respect to same gestational age group, when compared statistically, were relatively similar in their pregnancy outcome but the management was associated with increased risk of obstetrical interventions. Increased fetal surveillance is essential to know the well-being of the foetus with oligohydramnios and crucial for necessary and timely obstetrical intervention.

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