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FETO- MATERNAL OUTCOME IN OLIGOHYDRAMNIOS A RETROSPECTIVE STUDY

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ABSTRACT

Background: The significance of amniotic fluid volume as a marker of foetal welfare has become its evaluation a crucial component of antenatal foetal monitoring. Abnormalities including meconium staining, congenital abnormalities, growth retardation, dysmaturity, and fetal hypoxia have been linked to diminished amniotic fluid content.

Objectives: To assess the feto-maternal outcomes in women with oligohydramnios (AFI <5 cm)

Methods: A retrospective cohort study was conducted in a tertiary care centre, for a duration of 24 months from 2022 to 2023, in which a total of 51 women who have been diagnosed with AFI <5 cm were included irrespective of their gestational age. Women with twins, anomalous foetuses and severe FGR were excluded from the study. These women were analysed for various parameters such as socio-demographic data, patient profiles, associated co-morbidities and the following results were obtained.

Results: The most commonly prevalent age group was <25 years (72.5%), belonging to the upper middle class (66.7%), and hailing from rural areas. Multi gravida (58.8%) were more compared to primis (41.2%). Term gestations (58.8%) were the largest group, with emergency LSCS (90.2%) being the most common mode of termination. The post-operative/delivery stay was not significantly affected. The most common co-morbidities were hypothyroidism (11.8%), GDM (7.8%), and PIH (5.9%). All those neonates delivered at term gestation had normal birthweight. The admission rate to NICU was 19.6%, with RDS (9.8%) as the most common cause.

Conclusion: The most notable maternal outcome was termination of pregnancy via LSCS, with no associated short- or long-term maternal morbidities observed. In contrast, a considerable proportion of neonates developed RDS, necessitating NICU admission and therapeutic management.

Keywords: Antenatal, Foetal, LSCS, Oligohydramnios, Outcome.

INTRODUCTION

Amniotic fluid is essential for the good survival of the foetus. Amniotic fluid is the liquid encasing the foetus, providing multiple functions such as cushioning the foetus from injury, preventing umbilical cord compression, regulating temperature, facilitating foetal movement, exhibiting bacteriostatic properties, creating a physical space for musculoskeletal development, and promoting normal lung development.(1)

The significance of amniotic fluid volume as a marker of foetal welfare has become its evaluation a crucial component of antenatal foetal monitoring. Abnormalities including meconium staining, congenital abnormalities, growth retardation, dysmaturity, and fetal hypoxia have been linked to diminished amniotic fluid content.(2) Phelan JP et al., characterized oligohydramnios via sonographic criteria as an amniotic fluid index below 5 cm.(3) The incidence is 2.3% of all pregnancies and is seen among 1% to 5% of term pregnancies.(4)

Clinically, oligohydramnios is frequently linked to higher caesarean delivery rates, often prompted by foetal distress detected on surveillance such as non-stress tests (NSTs) and Doppler assessments.(5) Oligohydramnios at term correlated with more frequent induction of labor, increased meconium-stained liquor, and elevated neonatal ICU admissions.(6) Significant perinatal mortality and morbidity, including meconium staining, low Apgar scores, and NICU stays are reported with oligohydramnios.

The factors contributing to oligohydramnios in the third trimester remain largely unknown and incompletely understood; nonetheless, they are presumed to include idiopathic causes, early rupture of membranes, placental abruption, uteroplacental insufficiency, inadequate nutrition, congenital anomalies, and iatrogenic factors.(7) Timely identification and therapy of oligohydramnios instances may mitigate perinatal morbidity and death, as well as decrease caesarean delivery rates.(5) Oligohydramnios significantly affects perinatal outcomes and maternal morbidity, making it a serious and prevalent complication of pregnancy.(8)

METHODOLOGY

This was a prospective observational study conducted among 51 mothers in a tertiary care centre in South India. The study was performed with ethical approval and with informed consent obtained in the local language. Enrolled patients underwent a comprehensive assessment of their demographic profile, medical history, obstetric history, and any prenatal complications associated with the current pregnancy; general examination, obstetric examination, and bimanual examination were conducted. All cases underwent ultrasonography to assess the amniotic fluid index using Phelen's approach.

Inclusion criteria

- Pregnant women aged 18 years or older with gestational age between 28 to 40 weeks, as confirmed by ultrasound or reliable menstrual history and amniotic fluid index (AFI) < 5 cm, as measured by ultrasonography were included.

Exclusion criteria

- Patients with a history of preterm premature rupture of membranes (PPROM).
- Those women with presence of major foetal anomalies on ultrasound.
- Multiple pregnancies.
- Those without consent.

The gestational age range of 28–40 weeks was chosen because it includes the period of established foetal viability, when oligohydramnios has the most clinically relevant impact on perinatal outcomes. Before 28 weeks, causes and prognoses differ significantly, often involving lethal anomalies and limiting intervention feasibility. In the late second and third trimesters, common aetiologies such as placental insufficiency and hypertensive disorders allow for timely obstetric interventions to improve outcomes. Restricting to this range also minimizes confounding factors, enhancing the validity and applicability of the study's findings.

Statistical analysis

The data was collected using Microsoft 365 Excel and analysed using SPSS v27.0. The normality test (Shapiro-Wilk Test) was performed to analyse the data, and the results were expressed as frequency with percentage and mean with standard deviation or median with interquartile range. Association between categorical variables was assessed using Chi-square test or Fisher's exact test. Association between quantitative variables was assessed using independent t test. All the statistical analyses were carried out at a 5% level of significance, and results with the P value < 0.05 were considered statistically significant.

RESULTS

This study was conducted among 51 mothers who fulfilled the inclusion and exclusion criteria. The mean age of the study population was 24.5 ± 3.7 years. Majority of the study population were of younger age with age less than 25 years (75.5%) (Figure 1).

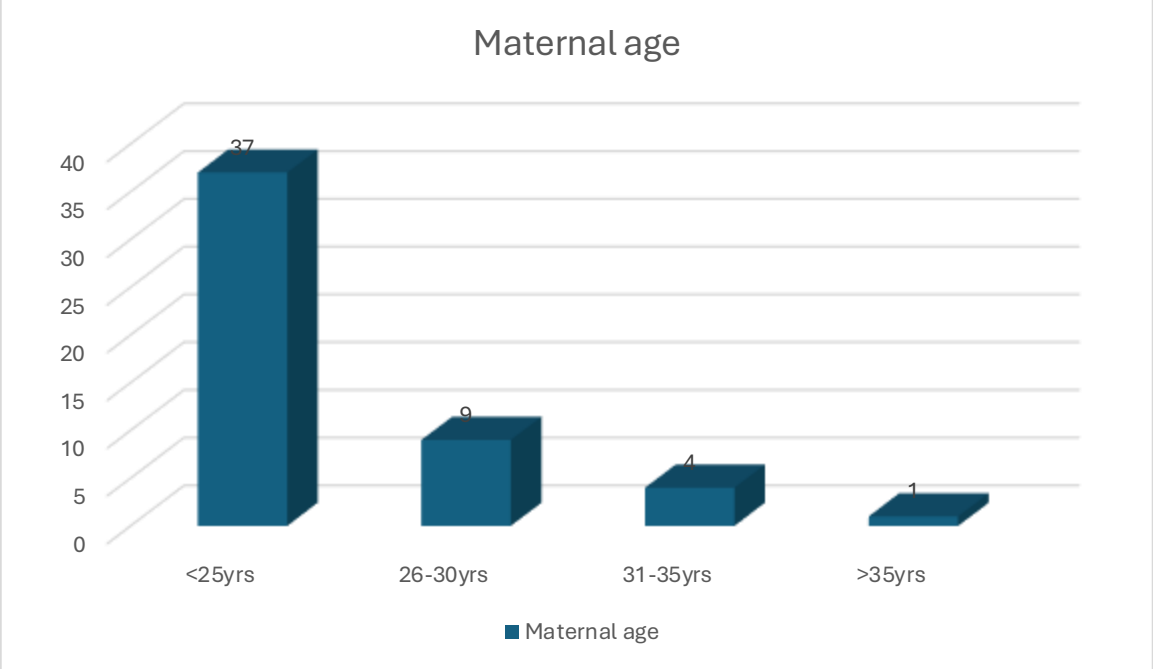

Figure 1: Distribution of subjects according to age group

Majority of the study participants had a minimum education up to 10th standard (70.5%), while only four (7.8%) were illiterate in the study. Most participants were residing in rural areas (82.4%) and belonged to lower middle socio-economic status (66.7%).

Almost 3/4th of the cases were booked in this study and majority were multigravida (58.8%). Most of the subjects were either in preterm (58.8%) or late preterm (35.3%). There was only one subject who were very preterm in this study (Table 1).

Table 1: Distribution of gestational age of the study population

Gestational age	**Frequency**	**Percentage**
Very preterm(28-32wks)	1	2.0%
Moderate preterm (32-33+6wks)	2	3.9%
Late Preterm (34-36+6wk)	18	35.3%
Term (37-41+6wks)	30	58.8%

In this study the majority (90.2%) had to undergo emergency LSCS, among which three-forth lasted less than one hour (74.5%). Hospital stays for a period of 48 – 72 hours were seen more in the post op period (72.5%) and less than 48 hours were seen during the pre op period (96.1%) (Table 2).

Table 2: Distribution of subjects according to hospital stay

Hospital stay (in hours)	**Preop**		**Postop**	
	N	**%**	**N**	**%**
<48hr	49	96.1%	0	0
48-72hrs	2	3.9%	37	72.5%
3-5days	0	0	3	5.9%
5-7days	0	0	9	17.6%
>7days	0	0	2	3.9%

The most common maternal comorbidity seen in this study was hypothyroidism (11.8%), followed by GDM (7.8%) and PIH (5.9%). In the study the most common antepartum complications were PPROM (11.8%) and PROM(11.8%), followed by PIH (5.9%) and IUGR (5.9%).

The most common mode of delivery in this study was emergency LSCS (90.2%), followed by full term normal delivery (5.9%) and elective LSCS (3.9%) (Figure 2).

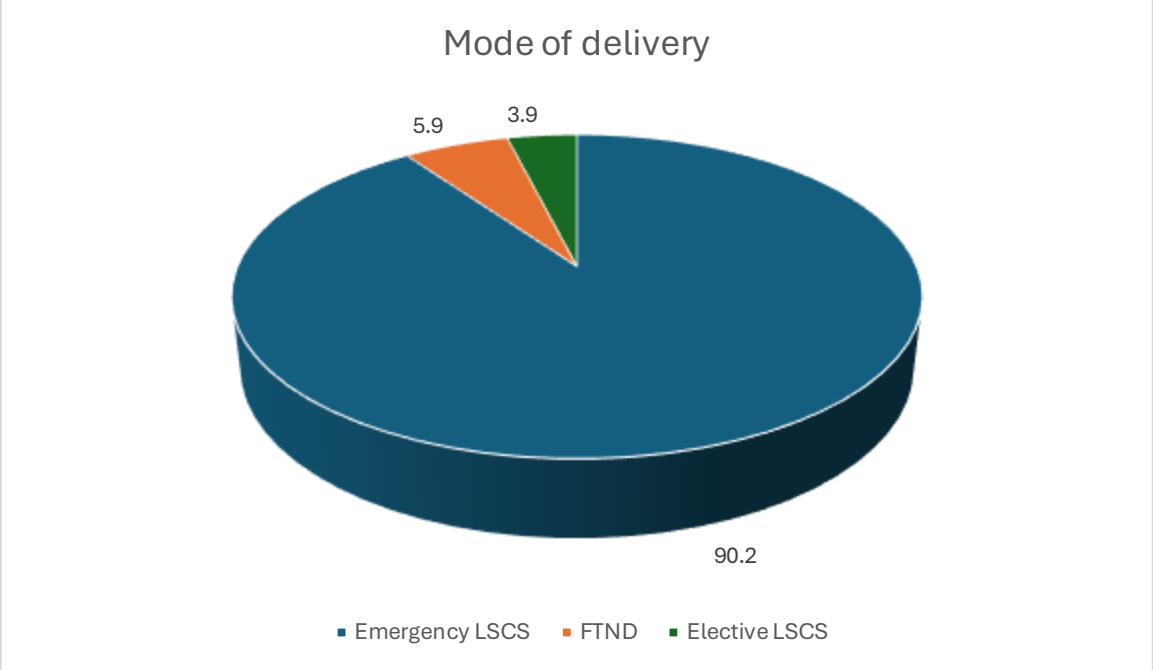

Figure 2: Mode of delivery in the study population

In this study most study participants had normal weight babies (58.8%), while few had low birth weight (37.3%) and only two (3.9%) had very low birth weight babies. Most of the newborns had an APGAR score of more than 7 (96.1%) and ten newborns had to get admitted to NICU (19.6%). The main reasons for NICU admission were respiratory distress syndrome (9.8%), treatment for sepsis/infection (9.8%), and prophylactic antibiotic therapy (11.8%) (Table 3).

Table 3: Distribution of subjects according to reason for NICU admission

Reason for NICU admission	Frequency	Percentage
Respiratory distress syndrome	5	9.8%
prematurity	1	2.0%
LBW	3	5.9%
Meconium aspiration syndrome	1	2.0%
Prophylactic antibiotic therapy	6	11.8%
Treatment for infection/sepsis	5	9.8%

DISCUSSION

Oligohydramnios can affect upto one tenth of pregnancies, and the prognosis for such pregnancies is contingent upon gestational age and the underlying aetiology.

In our study, most participants were young, with a mean age of 24.5 years. This is similar to the studies conducted by Bhat et al., in which most of the participants were in the age group of 20 to 30 years.(9) similar finding were reported by Modi et al. and Casey et al.(10)(11) This age range likely reflects the peak childbearing years in many populations. In the Radhamani et al., study the majority of patients were in the higher age group (37 and 40 years) which highlights the fact that oligohydramnios can also occur in older maternal age groups, suggesting that maternal age alone is not a limiting factor for its occurrence, and that other risk factors and comorbidities may play a role.(12).

In this study the majority (90.2%) had to undergo emergency LSCS primarily due to non-reassuring foetal status. This trend aligns with other studies (9)(10) that demonstrate a strong association between oligohydramnios and foetal distress. This high LSCS rate emphasizes the importance of vigilant foetal monitoring and rapid decision-making in these cases. In the current study the incidence of oligohydramnios was more in the multigravida compared to the primi. In their study, Bhat et al. found that 54% of primigravida and 46% of multigravida had this condition. (9) In the study by Petrozella et al., 60.0% of first-time mothers had oligohydramnios.(13) The higher incidence among multigravida in the present study could

be attributed to cumulative obstetric risk factors such as prior pregnancy complications, uteroplacental insufficiency from previous deliveries, or higher prevalence of chronic maternal conditions (e.g., hypertension, diabetes) in older, multiparous women. Conversely, the predominance in primigravida reported by other studies may be linked to a higher frequency of undiagnosed hypertensive disorders or preeclampsia in first pregnancies, which are known contributors to reduced amniotic fluid volume. Differences in demographic characteristics, healthcare access, and antenatal monitoring protocols may further explain the observed disparities.

Oligohydramnios was found to be higher in late preterms, necessitating the need for intervention at the earliest. The increased number of caesarean sections also reflect the occurrence of oligohydramnios at an early stage.
In this study, the majority of participants had normal weight infants, while a minority had low birth weight, and just two participants had very low birth weight infants. Similar findings were seen in the studies conducted by Biradar et al. and Ghosh et al.(14)

In the present study, most neonates had an Apgar score above 7 at 5 minutes, and only ten required NICU admission. This is more favorable compared to Ghosh et al., who reported 43.6% of newborns with scores below 7 at 5 minutes, and to other studies by Biradar et al., Patel PK et al., and Vidyasagar V et al., which documented lower Apgar scores at 1 minute in 6–35% of cases.(14–16) Despite oligohydramnios, timely obstetric interventions and adequate intrapartum monitoring in the current study setting may have contributed to better immediate neonatal outcomes.

The most common indications for NICU admission in our cohort were respiratory distress syndrome (RDS) and suspected or confirmed sepsis, consistent with the findings from other studies.(17,18) These outcomes indicate that oligohydramnios not only affects birth weight but also predisposes neonates to respiratory and infectious complications. Such data support the implementation of prophylactic and supportive neonatal care strategies in these cases.

Our study has certain limitations, the most notable being the relatively small sample size and its single-centre design, which may limit the extent to which the findings can be generalized to broader populations. Conducting future research with larger sample sizes and involving multiple centres across diverse geographic and demographic settings would enhance the external validity of the results. Such multicentric studies could also account for variations in clinical practice, population characteristics, and healthcare resources, thereby providing a more comprehensive understanding of the relationship between oligohydramnios and maternal–fetal outcomes.

CONCLUSION

Routine antepartum assessment of the AFI is essential for identifying pregnancies that require closer monitoring for potential complications. When oligohydramnios poses a significant fetal risk, timely delivery, often via LSCS should be considered. As a considerable proportion of neonates may develop RDS, clinicians should anticipate this complication and ensure that NICU facilities and appropriate neonatal support are readily available at the time of delivery.

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