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Original Research Article

A Retrospective Study on Obstetric and Perinatal Outcomes in Pregnancies Complicated by Oligohydramnios

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Abstract:

Background: Oligohydramnios, defined as a reduction in amniotic fluid volume, remains a significant concern in obstetric practice due to its association with adverse maternal and perinatal outcomes. It may result from a range of etiological factors including placental insufficiency, fetal anomalies, ruptured membranes, and post-term gestation. Prompt identification and appropriate management are essential to mitigate fetal risks, which may include meconium aspiration, growth restriction, umbilical cord compression, and stillbirth.

Objective: This study aimed to evaluate obstetric and perinatal outcomes in pregnancies complicated by oligohydramnios, with particular focus on maternal characteristics, mode of delivery, and neonatal morbidity and mortality.

Methods: A retrospective observational study was conducted across two tertiary care centers—Sadar Hospital Khunti, Ranchi, and Bhagwan Mahabir Manipal Hospitals, Ranchi—over a one-year period (July 2024 to June 2025). 70 pregnant women who met inclusion criteria with a confirmed diagnosis of oligohydramnios, characterized by an AFI less than 5 cm, were enrolled in the study. Data on gestational age, parity, maternal age at diagnosis, Apgar scores, birth weight, delivery mode, NICU admissions, and perinatal outcomes were collected and analyzed.

Results: Primigravidas constituted 65.7% of the study population. Cesarean delivery was performed in 58.6% of the cases, primarily prompted by indications such as abnormal fetal heart rate tracings suggestive of potential fetal distress. Low birth weight was observed in 45.7% of neonates, NICU admission was required in 28.6%, and the stillbirth rate was 5.7%.

Conclusion: Oligohydramnios is associated with increased obstetric intervention and unfavorable perinatal outcomes. Timely diagnosis and enhanced antenatal monitoring are essential to improve maternal and neonatal prognosis.

Introduction

Oligohydramnios, characterized by a decreased amount of amniotic fluid, is a significant obstetric condition linked to heightened risks of adverse maternal and neonatal outcomes [1]. Defined sonographically by an amniotic fluid index (AFI) below than 5 cm or a deepest pocket under 2 cm, oligohydramnios can result from a variety of fetal, maternal, and placental factors including uteroplacental insufficiency, fetal kidney anomalies, premature rupture of membranes, and post-term pregnancy [2]. The condition affects approximately 1–5% of all pregnancies, with a higher prevalence in the third trimester and in cases complicated by hypertensive disorders, intrauterine growth restriction (IUGR), and diabetes mellitus [3].

Although significant advancements have been made in prenatal diagnostics and fetal surveillance, oligohydramnios remains a challenging clinical entity. The reduction in amniotic fluid volume compromises the cushioning effect of the intrauterine environment, predisposing to cord compression, meconium aspiration, and low birth weight [4]. Furthermore, it increases the likelihood of labor induction, operative deliveries, and neonatal intensive care unit (NICU) admissions, especially when diagnosed in the late third trimester or in conjunction with abnormal Doppler findings [5].

Traditionally, the diagnosis of oligohydramnios and its implications have relied on ultrasonographic parameters and antenatal fetal surveillance tools.

However, the prognostic impact of oligohydramnios on perinatal outcomes varies widely depending on gestational age, etiology, and the presence of comorbid maternal or fetal conditions [6]. While numerous studies have addressed isolated oligohydramnios, data from semi-urban and resource-constrained settings in India are relatively sparse.

This retrospective study goal to estimate the obstetric and perinatal outcomes in pregnancies complicated by oligohydramnios at Sadar Hospital Khunti, Ranchi, and Bhagwan Mahabir Manipal Hospitals, Ranchi over a one-year period. The primary objective is to assess the relationship between oligohydramnios and outcomes such as Apgar scores, birth weight, mode of delivery, and NICU admissions, thereby contributing to better clinical decision-making and patient counseling in similar healthcare environments.

Materials and Methods

This retrospective observational study was passed out over a 12-month period, from July 2024 to June 2025, in the Obstetrics and Gynecology departments of two healthcare institutions: Sadar Hospital Khunti, Ranchi, and Bhagwan Mahabir Manipal Hospitals, Ranchi. 70 eligible women with singleton pregnancies ≥28 weeks and confirmed oligohydramnios were included in the study. Clinical and obstetric data were extracted from patient medical records and delivery registers.

Eligibility Criteria

Inclusion Criteria:

1. Gestational age of 28 weeks or more
2. Diagnosis of oligohydramnios confirmed by ultrasound (AFI <5 cm)
3. Singleton pregnancies

Exclusion Criteria:

- Multiple pregnancies
- Presence of major fetal anomalies
- Incomplete medical documentation
- Maternal chronic kidney disease

Data Collection: Maternal variables recorded included gestational age at diagnosis, parity, age, and presence of any pregnancy-related complications. Obstetric outcomes such as mode of delivery and indication for cesarean section were reviewed. Neonatal data collected included:

- Apgar scores at 1 and 5 minutes
- Requirement for NICU admission
- Birth weight
- Incidence of stillbirth or early neonatal death

All ultrasonographic assessments were conducted using standardized techniques. The AFI was measured using the four-quadrant method by experienced radiologists or obstetricians.

Outcome Measures: The primary parameter assessed was the type of delivery (vaginal or cesarean). Secondary measures included neonatal birth outcomes, such as weight at birth, Apgar score, NICU admission, and perinatal mortality.

Data Analysis: Data analysis was conducted using SPSS version 26. Quantitative variables were presented as mean ± SD and analyzed using t-tests. Categorical data were expressed as counts and percentages, with comparisons carried out using the Chi-square or Fisher's exact test. A p less than 0.05 was considered statistically significant.

Results

A total of 70 pregnant women diagnosed with oligohydramnios were included in this retrospective analysis. The average age of mother was 26.4 ± 3.2 years. A majority of the participants, 46 women (65.7%), were primigravidas, indicating that first-time mothers were more frequently affected in this cohort.

In terms of mode of delivery, cesarean section was the most common, performed in 41 cases (58.6%), primarily due to concerns such as failed induction or non-reassuring fetal heart rate patterns. The remaining 29 women (41.4%) underwent normal vaginal delivery.

Regarding perinatal outcomes, low birth weight—defined as less than 2.5 kg—was observed in 32 neonates (45.7%). A total of 14 newborns (20%) had an Apgar score below 7 at five minutes, indicating potential neonatal compromise. Additionally, NICU admission was required in 20 cases (28.6%) due to respiratory distress, meconium aspiration, or other complications. There were 4 reported stillbirths (5.7%) in this series (Table 1).

Table 1: Obstetric and Perinatal Outcomes in Oligohydramnios Cases

Parameter	Frequency (n)	Percentage (%)
Total Cases	70	100.0
Primigravida	46	65.7
Cesarean Deliveries	41	58.6
Vaginal Deliveries	29	41.4
Low Birth Weight (< 2.5kg)	32	45.7
NICU Admissions	20	28.6
Stillbirths	4	5.7

Discussion

This retrospective observational study, conducted over a one-year period across two tertiary care centers in Jharkhand, aimed to evaluate the obstetric and perinatal outcomes associated with pregnancies complicated by oligohydramnios. The findings from our cohort suggest that oligohydramnios is strongly associated with increased rates of cesarean deliveries and adverse neonatal outcomes, including NICU admissions, low birth weight, and stillbirths. These results align with existing literature, which consistently reports heightened fetal risk in pregnancies characterized by reduced amniotic fluid volume (7).

The elevated cesarean section rate observed in our study (58.6%) reflects the clinical tendency to intervene surgically in cases of suspected fetal compromise. This is particularly relevant in low-resource settings where continuous intrapartum monitoring may be limited. Several studies have reported similar associations, highlighting that oligohydramnios, especially when identified in the third trimester, significantly increases the likelihood of operative delivery due to non-reassuring fetal heart patterns or failed induction (8).

The perinatal morbidity observed—particularly low birth weight in 45.7% of cases and NICU admission in 28.6%—underscores the potential impact of compromised intrauterine environment on fetal growth and adaptation. Our stillbirth rate of 5.7%, while lower than some reports from rural India, remains a critical concern. These findings are in agreement with previous studies that link oligohydramnios to chronic placental insufficiency and intrauterine hypoxia, especially when conservative management is prolonged or referral is delayed (9, 10).

Despite the clinical relevance of our results, certain limitations merit attention. The retrospective design inherently limits the ability to control for confounding variables such as undetected fetal anomalies or unrecorded maternal comorbidities. Additionally, the study's sample size, although sufficient for descriptive analysis, may not capture subtle variations in outcomes across subgroups. The absence of longitudinal follow-up also precludes assessment of long-term neurodevelopmental or growth outcomes in neonates affected by oligohydramnios.

Nonetheless, the study's strengths include its dual-center design, real-world setting, and standardized diagnostic criteria. By analyzing a homogenous cohort using clearly defined outcome measures, this study contributes meaningful insights into the management of oligohydramnios in similar healthcare environments. Future prospective studies with larger sample sizes and extended neonatal follow-up are warranted to validate these findings and inform evidence-based protocols for antenatal care and delivery planning in pregnancies complicated by reduced amniotic fluid.

Conclusion

Among 70 pregnant individuals diagnosed with oligohydramnios, the mean (SD) maternal age was 26.4 (3.2) years, and 46 (65.7%) were primigravidas. Cesarean delivery was performed in 41 cases (58.6%), while 29 (41.4%) had a vaginal delivery. Low birth weight (<2.5 kg) was observed in 32 neonates (45.7%). Fourteen neonates (20.0%) had Apgar scores <7 at 5 minutes. A total of 20 neonates (28.6%) required admission to the neonatal intensive care unit, and there were 4 stillbirths (5.7%). These findings indicate that oligohydramnios is associated with an increased rate of cesarean delivery and higher risk of adverse perinatal outcomes.

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