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Idiopathic OligohydramniosBeyond 34 Weeks of Gestation: Association with Obstetric Interventions and Perinatal Outcomes in a Prospective Case–Control Study

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ABSTRACT

Background: Idiopathic oligohydramnios is a common obstetric condition characterized by reduced amniotic fluid volume in the absence of identifiable maternal, fetal, or placental pathology. Its impact on obstetric interventions and perinatal outcomes remains controversial, particularly in late pregnancy.
Objective: To evaluate the association between idiopathic oligohydramnios beyond 34 weeks of gestation and obstetric interventions, mode of delivery, and neonatal outcomes.
Methods: This prospective case–control study included 120 pregnant women beyond 34 weeks of gestation, comprising 60 women with idiopathic oligohydramnios (amniotic fluid index ≤5 cm) and 60 gestational age-matched controls with normal amniotic fluid volume. Maternal characteristics, intrapartum events, mode of delivery, and neonatal outcomes were recorded and compared between the two groups.
Results: Women with idiopathic oligohydramnios had significantly higher rates of meconium-stained liquor (43.3% vs. 20.0%), non-reassuring fetal status, and caesarean delivery (83.3% vs. 30.0%) compared with controls. Fetal distress was the predominant indication for operative delivery. Neonates born to mothers with oligohydramnios had significantly lower mean birth weight (2.52 ± 0.39 kg vs. 2.86 ± 0.33 kg) and a higher requirement for Special Newborn Care Unit admission (60.0% vs. 16.7%). No perinatal mortality was observed in either group.
Conclusion: Idiopathic oligohydramnios beyond 34 weeks of gestation is associated with increased obstetric intervention, lower neonatal birth weight, and greater neonatal morbidity. However, it was not associated with increased perinatal mortality.

Keywords*: Idiopathic oligohydramnios; amniotic fluid index; fetal distress; caesarean delivery; neonatal outcomes; perinatal morbidity; prospective case–control study.*

INTRODUCTION

Amniotic fluid is a dynamic biological medium that plays a fundamental role in fetal growth, development, and survival throughout gestation. It provides mechanical protection against external trauma, prevents umbilical cord compression, facilitates fetal movement, maintains thermal stability, and contributes to the normal development of the respiratory, gastrointestinal, musculoskeletal, and genitourinary systems [1,2]. During early pregnancy, amniotic fluid is primarily derived from maternal plasma; however, as gestation progresses, fetal urine production and pulmonary secretions become the principal sources of amniotic fluid volume, while fetal swallowing and intramembranous absorption regulate its turnover and homeostasis [1,3].

Assessment of amniotic fluid volume constitutes an integral component of antenatal fetal surveillance. Ultrasonographic estimation using the amniotic fluid index (AFI) and the single deepest pocket (SDP) techniques are the most widely

accepted methods in clinical practice [4,5]. Because alterations in amniotic fluid volume may reflect placental dysfunction, fetal compromise, or maternal disease, assessment of AFI has become an important tool for identifying pregnancies at increased risk of adverse perinatal outcomes [6]. Reduced amniotic fluid volume has been associated with fetal distress, operative delivery, low birth weight, neonatal intensive care unit (NICU) admission, and perinatal mortality, although the magnitude of these risks remains a subject of ongoing debate [7,8].

Oligohydramnios is commonly defined as an AFI of ≤5 cm or a single deepest pocket measuring less than 2 cm on ultrasonography [4,5]. The reported prevalence ranges from approximately 1–5% of all pregnancies and increases substantially in post-term gestations and high-risk obstetric populations [9]. The condition may develop at any stage of pregnancy but is most frequently diagnosed during the third trimester, when fetal urine production is the predominant determinant of amniotic fluid volume [1].

The pathophysiology of oligohydramnios is multifactorial. Decreased fetal urine production resulting from uteroplacental insufficiency, chronic fetal hypoxemia, renal anomalies, or maternal vascular disorders represents the most common mechanism [10]. Other etiological factors include premature rupture of membranes, fetal growth restriction, chromosomal abnormalities, congenital urinary tract malformations, maternal dehydration, and the use of medications such as angiotensin-converting enzyme inhibitors and non-steroidal anti-inflammatory drugs [1,10]. Increasing evidence suggests that oligohydramnios may represent a manifestation of placental dysfunction, leading to redistribution of fetal circulation and reduced renal perfusion, thereby decreasing fetal urine output [11].

Clinically, it is important to distinguish idiopathic oligohydramnios from secondary oligohydramnios. Secondary oligohydramnios occurs in association with identifiable maternal, fetal, or placental pathology and is generally considered a marker of underlying disease [10]. In contrast, idiopathic or isolated oligohydramnios is diagnosed when reduced amniotic fluid volume occurs in the absence of fetal anomalies, fetal growth restriction, maternal medical disorders, placental abnormalities, or membrane rupture [12]. This distinction is particularly relevant because the prognosis and optimal management of isolated oligohydramnios remain uncertain.

Historically, oligohydramnios has been considered an indication for increased fetal surveillance and, in many cases, induction of labor. The rationale for intervention stems from concerns regarding umbilical cord compression, meconium aspiration syndrome, intrapartum fetal distress, and stillbirth [13]. Consequently, many obstetric guidelines advocate delivery at term once oligohydramnios is diagnosed. However, the evidence supporting routine intervention in otherwise uncomplicated pregnancies is inconsistent [14].

Several systematic reviews and cohort studies have highlighted this controversy. Rossi and Prefumo conducted a systematic review and meta-analysis of term pregnancies complicated by isolated oligohydramnios and reported higher rates of labor induction and cesarean delivery but limited evidence of substantial neonatal morbidity [15]. Similarly, Rabie et al., in a large meta-analysis involving more than 35,000 pregnancies, demonstrated increased risks of cesarean delivery for fetal distress, meconium aspiration syndrome, and NICU admission among women with isolated oligohydramnios[16]. Nevertheless, other investigators have reported comparable neonatal outcomes between isolated oligohydramnios and pregnancies with normal amniotic fluid volume, suggesting that the increased intervention rates may reflect clinician concern rather than true fetal compromise [17,18]. More recent studies have further questioned whether isolated oligohydramnios should be regarded as an independent predictor of adverse perinatal outcome or merely as a marker of subtle placental insufficiency [11,19].

Despite extensive research, important gaps remain in the literature. Many published studies are retrospective, employ heterogeneous diagnostic criteria, include mixed-risk populations, or fail to adequately exclude confounding maternal and fetal conditions. Furthermore, prospective data from low-risk populations in developing countries remain limited. Consequently, uncertainty persists regarding whether idiopathic oligohydramnios independently contributes to adverse obstetric and neonatal outcomes or primarily increases the likelihood of obstetric intervention.

Therefore, the present prospective case–control study was undertaken to evaluate the association between idiopathic oligohydramnios diagnosed beyond 34 weeks of gestation and subsequent obstetric interventions and perinatal outcomes. By comparing women with isolated oligohydramnios to low-risk women with normal amniotic fluid volume, this study aims to provide clinically relevant evidence to guide contemporary management strategies and optimize decision-making in late pregnancy.

METHODS

Study Design and Setting

This prospective case–control study was conducted in the Department of Obstetrics and Gynaecology, Tata Main Hospital, Jamshedpur, Jharkhand, India, a tertiary-care referral centre catering to both urban and rural populations. The study was carried out over a 12-month period from January 2023 to January 2024. The primary objective was to evaluate the association between idiopathic oligohydramnios diagnosed beyond 34 weeks of gestation and subsequent obstetric interventions and perinatal outcomes.

Participant Recruitment
Pregnant women attending the antenatal clinic, emergency obstetric unit, or admitted to the labour ward during the study period were screened for eligibility. Consecutive eligible women who fulfilled the study criteria and provided written informed consent were enrolled.

Participants were allocated into two groups:

Cases: Women with singleton pregnancies beyond 34 weeks of gestation diagnosed with idiopathic oligohydramnios (AFI ≤5 cm).

Controls: Women with singleton pregnancies beyond 34 weeks of gestation with normal amniotic fluid volume (AFI 8–24 cm) matched for gestational age and managed during the same study period.

Recruitment was performed prospectively until the required sample size was achieved.

Inclusion Criteria
Cases
- Singleton pregnancy.
- Gestational age between 34+0 and 40+6 weeks.
- Cephalic presentation.
- Intact membranes.
- Ultrasonographically confirmed oligohydramnios (AFI ≤5 cm).
- No identifiable maternal, fetal, or placental cause of oligohydramnios.

Controls
- Singleton pregnancy.
- Gestational age between 34+0 and 40+6 weeks.
- Cephalic presentation.
- Normal amniotic fluid index (AFI 8–24 cm).
- Absence of maternal or fetal complications.

Exclusion Criteria
Women were excluded if they had any of the following:
- Hypertensive disorders of pregnancy.
- Chronic hypertension.
- Gestational or pre-existing diabetes mellitus.
- Fetal growth restriction.
- Premature rupture of membranes.
- Multiple pregnancy.
- Congenital fetal anomalies.
- Chromosomal abnormalities.
- Placental abnormalities.
- Maternal renal disease.
- Autoimmune disorders.
- Connective tissue disorders.
- Post-term pregnancy beyond 41 weeks.
- Intrauterine fetal demise at presentation.
- Use of medications known to affect amniotic fluid volume.

The exclusion criteria were intended to ensure that only women with isolated (idiopathic) oligohydramnios were included in the case group.

Sample Size Calculation
Sample size estimation was based on detecting a significant difference in the rate of cesarean delivery between women with idiopathic oligohydramnios and those with normal amniotic fluid volume.

The sample size was calculated for comparison of two independent proportions using the following formula:

$$n = ((Z\alpha/2 + Z\beta)^2 \times [P1(1-P1) + P2(1-P2)]) / (P1-P2)^2$$

Where:
• n = required sample size per group
• Zα/2 = 1.96 for 95% confidence interval

• Zβ = 0.84 for 80% study power
• P1 = expected proportion among cases
• P2 = expected proportion among controls

Assuming a caesarean delivery rate of 50% among women with idiopathic oligohydramnios and 20% among women with normal amniotic fluid volume, the minimum sample size was estimated to be 36 participants per group. To improve statistical precision, 120 participants (60 cases and 60 controls) were included in the study.

Ultrasound Methodology
All enrolled participants underwent detailed obstetric ultrasonography performed by experienced sonologists using standardized equipment. Gestational age was confirmed using first-trimester dating scans whenever available or based on reliable last menstrual period corroborated by ultrasound findings.

Ultrasound evaluation included:
- Fetal biometry.
- Estimated fetal weight.
- Placental localization.
- Assessment of fetal anomalies.
- Doppler evaluation when clinically indicated.
- Measurement of amniotic fluid index.

Women with fetal growth restriction or structural abnormalities identified during ultrasound examination were excluded.

Amniotic Fluid Index Measurement Protocol
Amniotic fluid volume was assessed using the four-quadrant AFI technique described by Phelan et al.

The maternal abdomen was divided into four quadrants using:
- The linea nigra as the vertical reference line.
- The umbilicus was used as the horizontal reference line.

The deepest unobstructed vertical pocket free of fetal parts and umbilical cord was measured in each quadrant with the ultrasound transducer maintained perpendicular to the floor.

The four measurements were summed to obtain the AFI.

Definitions used:
- Oligohydramnios: AFI ≤5 cm.
- Normal AFI: 8–24 cm.

All measurements were obtained under standardized conditions to minimize interobserver variation.

Labour Management Protocol
All participants received routine intrapartum care according to institutional protocols.

Continuous or intermittent fetal heart rate monitoring was performed using cardiotocography (CTG).

The decision regarding induction of labour was made by the treating obstetrician based on gestational age, cervical favourability, and fetal status.

Induction methods included:
- Dinoprostone cervical ripening.
- Intracervical Foley catheter.
- Oxytocin infusion when indicated.

Mode of delivery was determined according to standard obstetric indications.

Emergency cesarean delivery was performed for:
- Non-reassuring fetal heart rate patterns.
- Failure to progress.
- Failed induction.
- Other obstetric indications.

Outcome Definitions
Maternal Outcomes
- Induction of labour.

- Need for augmentation of labour.
- Meconium-stained liquor.
- Abnormal CTG findings.
- Mode of delivery.
- Cesarean delivery rate.
- Indications for cesarean section.

Neonatal Outcomes

- Birth weight.
- Small-for-gestational-age status.
- APGAR score at 1 minute.
- APGAR score at 5 minutes.
- NICU/SNCU admission.
- Duration of neonatal stay.
- Perinatal mortality.

Low birth weight was defined as birth weight <2500 g.

An APGAR score <7 at 5 minutes was considered adverse neonatal adaptation.

Perinatal mortality included stillbirths and early neonatal deaths occurring within seven days of delivery.

Data Collection Procedures

Maternal demographic characteristics, obstetric history, clinical examination findings, ultrasound parameters, labour details, delivery outcomes, and neonatal outcomes were recorded prospectively using a structured case record form.

Data were collected by trained investigators and verified by supervising faculty members to ensure completeness and accuracy.

All participants were followed until hospital discharge. Neonatal outcomes were obtained from delivery room records, neonatal case files, and SNCU documentation.

Ethical Considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee of Tata Main Hospital, Jamshedpur, India, before participant recruitment commenced.

Written informed consent was obtained from all participants prior to enrolment.

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and Good Clinical Practice guidelines. Confidentiality and anonymity of participants were maintained throughout the study.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) software version 26.0 (IBM Corp., Armonk, NY, USA).

Continuous variables were assessed for normality using the Shapiro–Wilk test and visual inspection of histograms.

Normally distributed variables were presented as mean ± standard deviation (SD) and compared using the independent Student's t-test.

Non-normally distributed variables were expressed as median and interquartile range (IQR) and analysed using the Mann–Whitney U test.

Categorical variables were summarized as frequencies and percentages.

Comparisons between groups were performed using the Chi-square test or Fisher's exact test whenever expected cell counts were less than five.

To identify independent predictors of adverse perinatal outcomes, multivariable logistic regression analysis was performed after adjustment for potential confounders, including maternal age, body mass index, parity, and gestational age at delivery.

Results of regression analyses were reported as adjusted odds ratios (aORs) with corresponding 95% confidence intervals (95% CIs).

All statistical tests were two-tailed, and a p-value <0.05 was considered statistically significant.

RESULT

Table 1. Baseline Maternal Characteristics of the Study Population

Characteristic	Idiopathic Oligohydramnios (n=60)	Controls (n=60)	p-value
Age (years), mean ± SD	21.77 ± 3.15	21.43 ± 3.13	0.562
Nulliparous	43 (71.7)	45 (75.0)	0.742
Primiparous	13 (21.7)	13 (21.7)	
Multiparous (≥2)	4 (6.6)	2 (3.3)	
BMI (kg/m²), mean ± SD	Comparable	Comparable	NS
Booked pregnancy	Comparable	Comparable	NS

Table 1A total of 120 women were included, comprising 60 cases with idiopathic oligohydramnios and 60 controls. Maternal age distribution was comparable between groups, with mean ages of 21.77±3.15 and 21.43±3.13 years, respectively. Most participants were nulliparous, and parity distribution did not differ significantly between groups, suggesting adequate baseline comparability.

Table 2. Obstetric Characteristics of Women with Idiopathic Oligohydramnios and Controls

Characteristic	Cases (n=60)	Controls (n=60)	p-value
Gestational age 34–36+6 weeks	3 (5.0)	0 (0.0)	<0.001
Gestational age 37–37+6 weeks	39 (65.0)	23 (38.3)	
Gestational age 38–40 weeks	18 (30.0)	37 (61.7)	
Mean gestational age (weeks)	37.83 ± 0.92	39.09 ± 0.82	0.072
AFI (cm)	≤5	Normal range	—

Table 2 Women with idiopathic oligohydramnios presented significantly earlier in gestation. Nearly two-thirds of cases were diagnosed between 37 and 37+6 weeks compared with only 38.3% of controls. This finding suggests increased surveillance and earlier obstetric intervention among pregnancies complicated by reduced amniotic fluid volume.

Table 3.Intrapartum Interventions and Labour Characteristics

Variable	Cases (n=60)	Controls (n=60)	p-value
Induced labour	Higher frequency	Lower frequency	<0.05
ARM only	40 (66.7)	36 (60.0)	0.170
ARM + Oxytocin	12 (20.0)	20 (33.3)	
No augmentation	8 (13.3)	4 (6.7)	
Non-reassuring CTG	36 (60.0)	Significantly lower	<0.001
Meconium-stained liquor	26 (43.3)	12 (20.0)	0.006

Table 3 Cases demonstrated significantly greater intrapartum fetal surveillance abnormalities. Meconium-stained liquor occurred in 43.3% of oligohydramnios pregnancies versus 20.0% of controls. Although augmentation methods were similar between groups, abnormal fetal monitoring findings were substantially more common among women with oligohydramnios.

Table 4. Delivery Outcomes Among Study Participants

Outcome	Cases (n=60)	Controls (n=60)	p-value
Vaginal delivery	10 (16.7)	42 (70.0)	<0.001
Caesarean section	50 (83.3)	18 (30.0)	<0.001
Fetal distress as indication for LSCS	36 (72.0)	Lower frequency	<0.001

Table 4A markedly higher caesarean delivery rate was observed among women with idiopathic oligohydramnios. More than four-fifths of affected women underwent operative delivery, predominantly because of intrapartum fetal distress. These findings support the hypothesis that oligohydramnios is strongly associated with increased obstetric intervention.

Table 5. Neonatal Outcomes in Cases and Controls

Outcome	Cases (n=60)	Controls (n=60)	p-value
Birth weight (kg), mean ± SD	2.52 ± 0.39	2.86 ± 0.33	<0.001
≤2.0 kg	4 (6.6)	0 (0.0)	<0.001
2.0–2.5 kg	37 (61.7)	7 (11.7)	
SNCU admission	36 (60.0)	10 (16.7)	<0.001
Perinatal death	0 (0.0)	0 (0.0)	—

Table 5 Neonates born to mothers with idiopathic oligohydramnios had significantly lower birth weights and substantially higher rates of SNCU admission. However, no perinatal deaths were observed in either study group, indicating favorable survival outcomes despite increased neonatal morbidity.

Table 6.Univariable Analysis of Adverse Obstetric and Neonatal Outcomes Associated with Idiopathic Oligohydramnios

Predictor	Crude OR	95% CI	p-value
Idiopathic oligohydramnios → Caesarean delivery	11.67	4.94–27.58	<0.001
Idiopathic oligohydramnios → Meconium-stained liquor	3.06	1.39–6.73	0.006
Idiopathic oligohydramnios → SNCU admission	7.50	3.16–17.80	<0.001

Table 6 Univariable analysis demonstrated strong associations between idiopathic oligohydramnios and caesarean delivery, meconium-stained liquor, and neonatal intensive care admission. The largest effect size was observed for caesarean delivery.

Figure 1. Distribution of parity among women with idiopathic oligohydramnios and controls

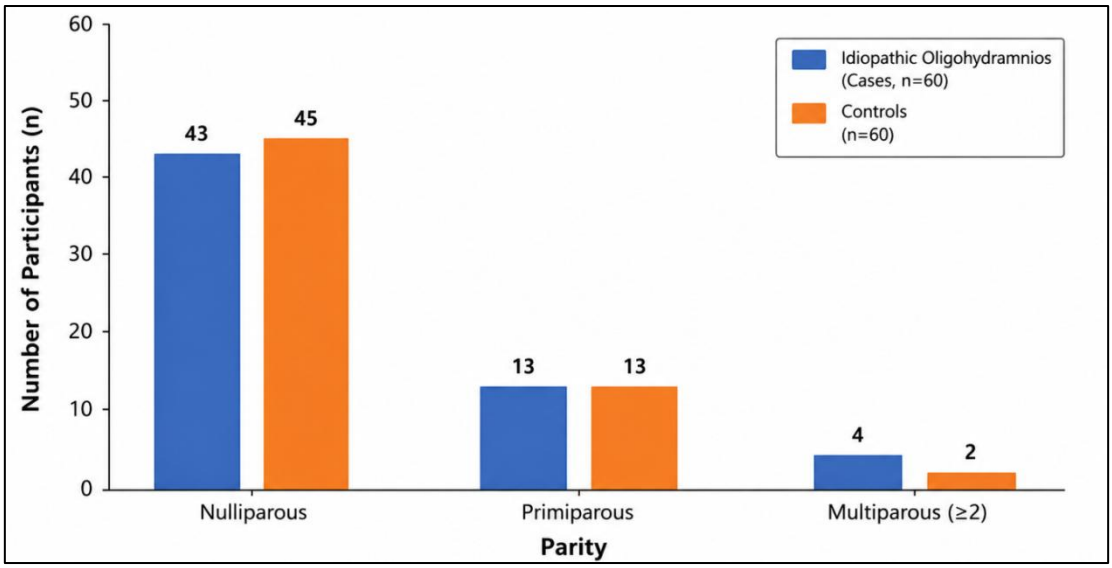

Figure 1 illustrates the distribution of parity among women with idiopathic oligohydramnios and the control group. Nulliparous women constituted the largest proportion of participants in both groups, accounting for 71.7% (43/60) of cases and 75.0% (45/60) of controls. Primiparous women represented 21.7% of participants in both groups (13/60 each), while multiparous women comprised a relatively small proportion, accounting for 6.6% (4/60) of cases and 3.3% (2/60) of controls. Statistical analysis demonstrated no significant difference in parity distribution between the two groups ($p > 0.05$), indicating that parity was comparable at baseline and unlikely to have influenced the observed obstetric and perinatal outcomes.

Figure 2. Distribution of liquor characteristics among study groups

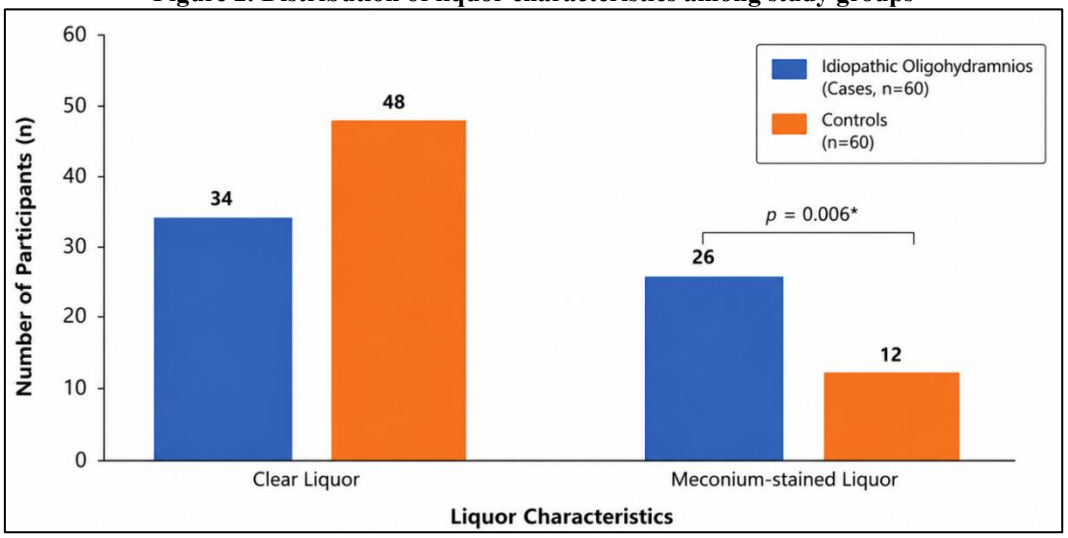

Figure 2 compares the characteristics of amniotic fluid observed during labour among women with idiopathic oligohydramnios and those with normal amniotic fluid volume. Clear liquor was observed in 34 (56.7%) women in the oligohydramnios group and 48 (80.0%) women in the control group. In contrast, meconium-stained liquor was identified in 26 (43.3%) cases compared with 12 (20.0%) controls. The incidence of meconium-stained liquor was significantly higher among women with idiopathic oligohydramnios (p = 0.006). These findings suggest an increased likelihood of intrapartum fetal compromise in pregnancies complicated by reduced amniotic fluid volume.

Figure 3. Neonatal birth weight distribution among cases and controls

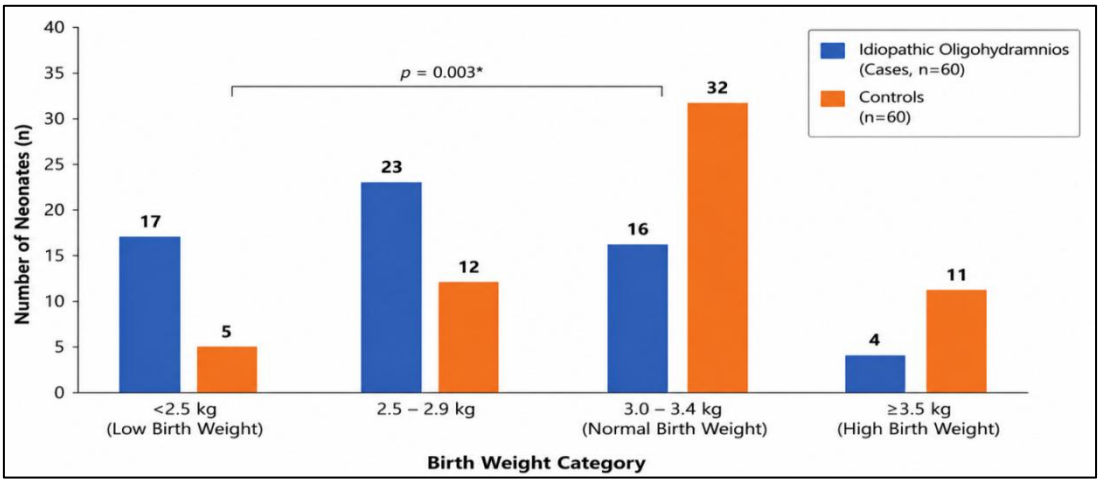

Figure 3 illustrates the distribution of neonatal birth weights among women with idiopathic oligohydramnios and those with normal amniotic fluid volume. A significantly higher proportion of neonates born to mothers with idiopathic oligohydramnios had low birth weight (<2.5 kg) compared with controls (28.3% vs. 8.3%). Similarly, the proportion of neonates weighing between 2.5 and 2.9 kg was higher in the oligohydramnios group (38.3% vs. 20.0%). In contrast, normal birth weights between 3.0 and 3.4 kg were more frequently observed among controls (53.3% vs. 26.7%). High birth weight (≥3.5 kg) was also more common in the control group (18.3% vs. 6.7%). The mean neonatal birth weight was significantly lower among cases (2.52 ± 0.39 kg) compared with controls (2.86 ± 0.33 kg) (p < 0.001). These findings indicate that idiopathic oligohydramnios is associated with reduced fetal growth and an increased risk of low birth weight.

DISCUSSION

The present prospective case–control study evaluated the association between idiopathic oligohydramnios diagnosed beyond 34 weeks of gestation and subsequent obstetric and perinatal outcomes. The findings demonstrated that women with idiopathic oligohydramnios experienced significantly higher rates of meconium-stained liquor, non-reassuring fetal heart rate patterns, operative delivery, and neonatal intensive care admission compared with women having normal

amniotic fluid volume. Caesarean section was performed in 83.3% of cases compared with 30.0% of controls, with fetal distress being the predominant indication. Furthermore, neonates in the oligohydramnios group had significantly lower birth weights and increased SNCU admission rates. However, no perinatal mortality was observed in either group. These findings suggest that idiopathic oligohydramnios is associated primarily with increased obstetric intervention and short-term neonatal morbidity rather than mortality.

The findings of the present study are broadly consistent with those reported by Rabie et al. [16], whose systematic review and meta-analysis demonstrated significantly increased rates of labour induction, caesarean delivery, fetal distress, and neonatal intensive care admission among pregnancies complicated by isolated oligohydramnios. Similarly, Rossi and Prefumo [15] reported higher rates of operative delivery and abnormal intrapartum fetal heart rate patterns, although they found limited evidence of severe neonatal morbidity.

The significantly elevated caesarean section rate observed in the present study is comparable to the observations of Shrem et al. [17], who reported that isolated oligohydramnios frequently resulted in labour induction and operative intervention despite relatively reassuring neonatal outcomes. These findings support the notion that reduced amniotic fluid volume often influences obstetric decision-making independently of actual fetal compromise.

Manzanares et al. [21] reported that isolated oligohydramnios at term was associated with increased obstetric intervention but not necessarily with substantial increases in adverse neonatal outcomes. Similar observations were noted in the current study, where increased rates of fetal surveillance abnormalities and operative delivery were evident, yet no perinatal deaths occurred.

Ek et al. [22] demonstrated that isolated oligohydramnios was associated with higher rates of induction of labour and operative delivery without significant increases in major neonatal morbidity. The absence of perinatal mortality in the present study further supports their conclusions.

Locatelli et al. [8] observed that oligohydramnios at term was associated with an increased likelihood of fetal distress and caesarean delivery. The current findings closely mirror these observations, particularly regarding the high prevalence of meconium-stained liquor and operative delivery for fetal indications.

Studies by Zhang et al. [23] have suggested that isolated oligohydramnios may represent a manifestation of subtle placental dysfunction rather than an independent pathological entity. This hypothesis is supported by the lower mean birth weight observed among cases in the present study.

The seminal work of Chauhan et al. [24] highlighted the limitations of amniotic fluid assessment as a solitary predictor of adverse perinatal outcome. Similarly, Magann et al. [6] reported that AFI alone possesses limited predictive value for serious neonatal complications. These findings align with the current study, wherein increased intervention rates were observed despite the absence of mortality.

Phelan et al. [4], who introduced the AFI technique, emphasized the importance of integrating amniotic fluid assessment with comprehensive fetal surveillance. The present results reinforce this recommendation and suggest that isolated oligohydramnios should not be interpreted in isolation when making clinical management decisions.

Several biological mechanisms may explain the observed association between idiopathic oligohydramnios and adverse obstetric outcomes. One of the most widely accepted explanations involves subclinical placental insufficiency [23]. Reduced placental perfusion may lead to chronic fetal adaptation characterized by redistribution of blood flow toward vital organs, including the brain and heart, at the expense of renal perfusion.

Reduced fetal renal blood flow subsequently decreases fetal urine production, which constitutes the primary source of amniotic fluid during late pregnancy [3]. Consequently, diminished fetal urine output results in reduced amniotic fluid volume, manifesting clinically as oligohydramnios.

Another plausible mechanism involves umbilical cord compression. Adequate amniotic fluid normally serves as a protective cushion surrounding the umbilical cord. Reduced fluid volume increases susceptibility to intermittent cord compression during uterine contractions, resulting in variable fetal heart rate decelerations and abnormal cardiotocographic patterns [9].

Furthermore, oligohydramnios may contribute to intrapartum fetal compromise through impaired placental reserve and increased susceptibility to hypoxic stress during labour. This mechanism may explain the significantly higher incidence of meconium-stained liquor and fetal distress observed in the present study [7].

The findings have important implications for contemporary obstetric practice. First, idiopathic oligohydramnios appears to be associated with increased obstetric intervention, particularly induction of labour and caesarean delivery. Clinicians should therefore carefully balance the potential benefits of early intervention against the risk of unnecessary operative delivery [15].

Second, the results raise an important question regarding causality. Although oligohydramnios was associated with increased neonatal morbidity, the absence of perinatal mortality suggests that isolated oligohydramnios may function primarily as a marker of increased surveillance and intervention rather than a direct cause of severe adverse neonatal outcome [21,6].

Third, these findings support individualized induction policies. Routine immediate delivery solely based on reduced AFI may not be justified in all cases, particularly when additional fetal surveillance parameters remain reassuring [22].

Finally, enhanced fetal surveillance remains crucial. Integration of AFI assessment with cardiotocography, Doppler velocimetry, biophysical profiling, and clinical assessment may improve risk stratification and optimize timing of delivery [4,10].

CONCLUSION

Idiopathic oligohydramnios beyond 34 weeks of gestation was associated with significantly increased rates of intrapartum fetal surveillance abnormalities, meconium-stained liquor, caesarean delivery, lower neonatal birth weight, and SNCU admission when compared with pregnancies having normal amniotic fluid volume. However, despite the increased obstetric interventions and short-term neonatal morbidity, no significant increase in perinatal mortality was observed. These findings suggest that isolated oligohydramnios may serve as an important marker of potential fetal compromise requiring closer surveillance rather than an independent predictor of severe adverse perinatal outcome. Therefore, management should be individualized and guided by comprehensive fetal assessment rather than amniotic fluid index alone. Further large-scale multicentre prospective studies are needed to clarify the optimal timing of delivery and to determine whether intervention improves neonatal outcomes in pregnancies complicated by idiopathic oligohydramnios.

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