Original Article

Fetal Outcomes in Patients with Isolated Oligohydramnios at Term Presenting to a Tertiary Care Hospital

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ABSTRACT

OBJECTIVE: To evaluate fetal outcomes in term pregnancies complicated by isolated oligohydramnios at a tertiary care hospital.

METHODOLOGY: This descriptive cross-sectional study was conducted in the Obstetrics and Gynaecology Department of Khyber Teaching Hospital, Peshawar, from March to September 2020. A total of 208 patients were selected using a non-probability consecutive sampling method with a 95% confidence interval and a 6% margin of error. Inclusion criteria: women of any parity and gravidity with singleton pregnancy, AFI ≤ 5 cm, gestational age 36–40 weeks, and intact membranes. Exclusion criteria: lack of consent, ruptured membranes, medical disorders, IUGR, fetal anomalies, and multiple pregnancies. AFI was measured by summing the vertical diameters of the largest amniotic fluid pockets in four uterine quadrants. Data on maternal and fetal outcomes were recorded and analyzed using SPSS Version 23.0, with a p-value < 0.05 considered significant.

RESULTS: In this study of 208 patients, 12% were aged 15–25 years, and 88% were 26–35 years. Gestational age was 36–38 weeks in 72% and 39–40 weeks in 28%. Primipara accounted for 13%, while 87% were multipara; 15% were primigravida and 85% multigravida. BMI was ≤25 kg/m² in 42% and >25 kg/m² in 58%. Low APGAR scores were observed in 17% of cases, and 8% required admission to the neonatal intensive care unit.

CONCLUSION: In pregnancies complicated by oligohydramnios at term, 17% of neonates had low APGAR scores, and 8% required NICU admission at a tertiary care hospital.

KEYWORDS: Amniotic fluid index, Common fetal outcome, Oligohydramnios, Perinatal complications, Pregnancy. Tertiary care hospital.

INTRODUCTION

Oligohydramnios is a condition that affects approximately 0.5% to 5% of all pregnancies and is characterized by a reduction in amniotic fluid relative to gestational age. Amniotic fluid, a clear liquid surrounding the fetus within the amniotic membrane, is necessary for the healthy growth of the antenatal gastrointestinal, urinary, and respiratory systems. It helps prevent contractures in the fetal musculoskeletal system[1].

Oligohydramnios is typically diagnosed when the amniotic fluid index (AFI) falls below the 5th percentile, indicating an abnormally low volume of amniotic fluid. The AFI is measured through ultrasound by summing the largest vertical fluid pockets in four quadrants of the uterus. An AFI of <5 cm or a single deepest vertical pocket (DVP) of ≤2 cm is classified as oligohydramnios, whereas an AFI between 5.1 cm and 8 cm is considered borderline[2].

This condition is more common in the third trimester, with reported prevalence varying by population and diagnostic criteria. The primary causes of oligohydramnios include: 1) Fetal factors – Chromosomal abnormalities, congenital disabilities, intrauterine growth restriction (IUGR), post-term Pregnancy, and fetal demise. 2) Maternal factors – Dehydration, hypertension, preeclampsia, diabetes, and uteroplacental insufficiency. 3) Medication-induced – Use of indomethacin or angiotensin-converting enzyme (ACE) inhibitors. 4) Idiopathic causes – Cases with no identifiable etiology[3,4].

Oligohydramnios is a potential indicator of fetal compromise. It is associated with an increased risk of adverse perinatal outcomes, including preterm delivery, low birth weight, low APGAR scores, intrauterine fetal demise, and NICU admissions. Early-onset oligohydramnios is particularly associated with a poor prognosis[5].

A 2017 study reported that oligohydramnios complicated by premature rupture of membranes (PROM) was associated with higher rates of neonatal sepsis and neonatal death[6]. Another study from India comparing pregnancies with borderline AFI to those with normal AFI found no significant difference in

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induction-to-delivery time or neonatal morbidity and mortality. However, pregnancies with oligohydramnios had higher rates of labor induction, stillbirths, non-reassuring fetal heart rate patterns, and increased NICU admissions[4].

Most women with oligohydramnios remain asymptomatic unless their membranes rupture, leading to a noticeable gush of fluid. On clinical examination, findings may include a smaller-than-expected fundal height and liquor drainage on speculum examination if the amniotic sac is ruptured. Ultrasound remains the gold standard for diagnosing oligohydramnios, with measurement by AFI or maximum vertical pocket (MVP)[8].

Management of oligohydramnios depends on gestational age. If diagnosed at about 20 weeks, the expected treatment is continuous fetal surveillance, amniotic infusion, amniopatch, cervical canal occlusion with fibrin gel, and maternal hydration. Oligohydramnios diagnosed at term (≥36 weeks**),** 36 fetal monitoring and induction of Labor should be considered after counseling with both partners[9]. Much is understood about fetal outcomes when PROM and other risk factors accompany oligohydramnios, prompting a more aggressive treatment approach by healthcare providers. However, there is limited knowledge regarding the impact of oligohydramnios on the fetus when no additional risk factors are present[10].

This study aims to evaluate the effects of isolated oligohydramnios in pregnancies beyond 36 weeks. The findings will contribute to updating clinical protocols and guidelines for managing such cases in our local population in Khyber Pakhtunkhwa. Additionally, this research will help determine whether expectant management until spontaneous labor is a safe option for these pregnancies without increasing fetal risks.

METHODOLOGY

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at Khyber Teaching Hospital from March to September 2020. The study received approval from the Registration and Research Cell of the College of Physicians and Surgeons, Pakistan. Two hundred and eight women were selected from the department using a non-probability consecutive sample technique with a 95% confidence interval and a 6% margin of error.

Inclusion criteria were women with any parity and gravidity, having a singleton pregnancy, an AFI of 5cm or less, assessed by ultrasound, a gestational age between 36 and 40 weeks, and intact membranes. Exclusion criteria were patients not giving consent, having ruptured membranes, women with medical disorders, patients having IU GR or a congenitally anomalous fetus and multiple pregnancies. The conditions mentioned above act as confounders and, if included, would introduce bias into the study results.

The amniotic fluid index was measured by dividing the uterine cavity into four quadrants using real-time B-scanning with a linear array. The largest vertical measurement of the amniotic fluid pocket in each quadrant was measured. The four measurements were then summed to determine the total volume of amniotic fluid.

All information, including age, gestational age, gravidity, parity, weight, height, birth weight, and fetal outcomes such as low Apgar scores and NICU admissions, was recorded. The data was analyzed using SPSS Version 23.0. Descriptive statistics were applied to determine the means and standard deviations for numerical variables, including age, gestational age, height, weight, and BMI. For categorical variables, frequencies and percentages were calculated, including fetal outcomes. Fetal outcomes were stratified by age, gestational age, and BMI to identify effect modifiers. After stratification, a chi-square test was conducted. A p-value of less than 0.05 was deemed significant.

RESULTS

This study analyzed 208 patients, examining their age, gestational age, parity, gravidity, and fetal outcomes. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were calculated.

To identify potential effect modifiers, fetal outcomes were stratified by age, gestational age, parity, and gravidity. The results are presented in the **Tables I, II, III and IV**.

Table I:
Stratification of fetal outcomes by age distribution

Fetal Outcome		15-25 years	26-35 years	Total	*P-value*
Low APGAR SCORE	Yes	4	31	35	0.9062
	No	21	152	173	
Total		25	183	208	
NICU Admissions	Yes	2	15	17	0.9731
	No	23	168	191	
Total		25	183	208	

Table II: Stratification of fetal outcomes based on gestational age

Fetal Outcome		36-38 weeks	39-40 weeks	Total	*P-value*
Low APGAR SCORE	Yes	25	10	35	0.9208
	No	125	48	173	
Total		150	58	208	
NICU Admissions	Yes	12	5	17	0.8835
	No	138	53	191	
Total		150	58	208	

Table III: Stratification of fetal outcomes by parity

Fetal Outcome		Primi para	Multi Para	Total	*P-value*
Low APGAR SCORE	Yes	5	30	35	0.8011
	No	22	151	173	
Total		27	181	208	
NICU Admissions	Yes	2	15	17	0.8762
	No	25	166	191	
Total		27	181	208	

Table IV:
Stratification of fetal outcomes by gravidity

Fetal Outcome		Primi Gravida	Multi Gravida	Total	*P-value*
Low APGAR SCORE	Yes	5	30	35	0.9695
	No	26	147	173	
Total		31	177	208	
NICU Admissions	Yes	3	14	17	0.7403
	No	28	163	191	
Total		31	177	208	

DISCUSSION

Oligohydramnios is characterized by a reduced volume of amniotic fluid relative to the gestational age. Amniotic fluid plays a vital role in fetal development, contributing to the proper maturation of the gastrointestinal, urinary, respiratory, and musculoskeletal systems while also preventing contractures. In this study of 208 women, the distribution of maternal and fetal characteristics was as follows:

Age distribution: 12% of women were aged 15–25 years, while 88% were aged 26–35 years. Gestational age: 72% of women had a period of gestation (POG) of 36–38 weeks, while 28% had a POG of 39–40 weeks. Parity and gravidity: 13% of women were primiparous, while 87% were multiparous. Similarly, 15% were primigravida, and 85% were multigravida. BMI: 42% had a BMI ≤25 kg/m², while 58% had a BMI >25 kg/m². Fetal outcomes: A low APGAR score was observed in 17% of cases, and NICU admissions occurred in 8% of cases.

This study aligned with the findings of a similar study conducted by Chauhan R 2019[11], which reported significant differences in the selected outcomes between the groups. Oligohydramnios was linked to a higher likelihood of labor induction (41% vs. 22%), non-reassuring fetal heart rate patterns (4.7% vs. 2.8%), fetal heart rate decelerations (48% vs. 38.8%), cesarean delivery due to fetal distress (32% vs. 23%), Apgar scores below 6 at 1 minute (8% vs. 1.1%), and Apgar scores below 7 at 5 minutes.

Shrestra R 2016[12] reported similar findings in their study, in which 26.4% of babies had a low APGAR score (< 7) at 1-5 minutes after birth. Clinically inadequate amniotic fluid was observed in 45.6% of cases. Additionally, 24% of NICU admissions (21 out of 87) were recorded, and a 6% incidence of congenital anomalies was observed.

This study's findings align with those of Nath J 2013[13]. In their research, among women diagnosed with oligohydramnios in the third trimester, 65.38% had babies with a birth weight under 2500 grams. Additionally, 34.61% of the infants had an APGAR score below 7 at 5 minutes, 15.38% experienced birth asphyxia, and 10.2% were diagnosed with meconium aspiration syndrome.

In a study by Modi JY 2016[14], 18% of infants with oligohydramnios were classified as small for gestational age (SGA), 15% had an APGAR score of less than 7 at 5 minutes, and 22% required admission to the NICU. The incidence of low birth weight was 56%, meconium aspiration syndrome was observed in 18% of cases, and birth asphyxia occurred in 20% of the babies.

In a study by Sriya R 2001[15], 38.8% of infants had an Apgar score below 7 at 1 minute. Casey et al. [16] discovered that 6% of infants had an Apgar score under 3 at 5 minutes, and seven out of these nine infants passed away during the neonatal period. Jun Z 2004[17] observed that 15 infants had an Apgar score below 7 at 1 minute, and 6 infants had an Apgar score below 7 at 5 minutes.

Infants with oligohydramnios showed a markedly increased incidence of meconium aspiration syndrome, even though meconium-stained amniotic fluid was less frequently identified. Jun Z 2004[17] examined perinatal outcomes in 55 postdate pregnancies and found oligohydramnios in four cases. The infants were hospitalized due to meconium aspiration, and tragically, one of them did not survive this complication.

Sriya R 2001[15] found that 88.88% of newborns with an AFI < 5cm were admitted to the NICU. Additionally, they noted that 65% had low birth weight, 15% were small for gestational age, 22% had meconium aspiration syndrome, and 24% experienced birth asphyxia. In contrast, Casey BM et al.[16] reported a lower NICU admission rate of 7% in patients with an AFI < 5cm. Browen CJS 1995[18] reported a NICU admission rate of 29.4% in patients with an AFI < 5cm in their research.

In another study by Ghosh R 2018[19], 65.5% of participants belonged to the 20-25 age group, and 35.5% were primigravida. The average age was 23.9 ± 3.3 years, and the average gestational age was 36.9 weeks. Approximately 72.2% of participants were within the gestational age range of 34 to 37 weeks.

The study observed fetal movements decreased (<10) in 56.4% of participants. Forty percent had an amniotic fluid index (AFI) of 4, and 27.3% had an AFI of 5. Vaginal delivery was performed in 47.3% of cases. Stillbirth occurred in 5.5% of cases, with prematurity being the leading cause. Around 71% of infants were born with low birth weight, and congenital anomalies were identified in 7.3% of infants. Apgar scores below 7 at 1 minute were observed in 65.4% of newborns, and below 7 at 5 minutes in 43.6% of newborns.

Another study by Jagatia K 2013[20] found comparable results, showing that among women with oligohydramnios at term, the most common fetal outcomes included low birth weight in 60% of cases, small for gestational age in 17%, meconium aspiration syndrome in 23%, birth asphyxia in 25%, and NICU admissions in 38%. These studies reinforce the association between low amniotic fluid levels and increased neonatal complications, making it crucial to monitor pregnancies complicated by oligohydramnios closely to improve perinatal outcomes.

CONCLUSION

The study found that among pregnancies complicated by oligohydramnios at term, the incidence of adverse fetal outcomes was significant. Specifically, 17% of neonates had a low APGAR score, and 8% required admission to the NICU. These findings highlight the importance of early diagnosis, close monitoring, and timely intervention in pregnancies affected by oligohydramnios to optimize fetal outcomes and minimize perinatal complications.

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AUTHOR CONTRIBUTION

Khattak N: Study concept, methodology, manuscript writing and Final approval

Robeen K: Analysis and Interpretation of data, manuscript drafting and Final approval

Zeb M: Statistical analysis, manuscript revision and Final approval

Riaz S: Manuscript editing, reviewing and Final approval

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