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Oligohydramnios as Prognostic Factor for Maternal Risk in Term Pregnancy and Fetal Outcome

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Abstract

Objective: The objective of this study is to examine oligohydramnios as a predictor of maternal risk during term pregnancy and its impact on fetal outcomes. **Study Design:** cross-sectional study. **Place and Duration:** This study was conducted in Sandeman Provisional Hospital, Quetta from July 2022 to July 2023. Methodology All patients diagnosed with oligohydramnios were included through non-probability consecutive sampling technique. Informed consent was obtained from each participant after explaining the study's methodology. Demographic data, clinical characteristics, obstetrical complications, and delivery methods were documented. Maternal and newborn outcomes during inpatient care were observed and recorded. **Results:** The study sample's mean gestational age was 38.53 ± 2.13 weeks, and its mean age was 27.86 ± 4.42 years. The majority of women (82%) and patients (73%) both had normal weights and no concomitant conditions. Merely 9% reported having oligohydramnios during a prior pregnancy. The type of delivery used by 92% of the women in the research was caesarean section. In the Neonatal Intensive Care Unit (NICU), 15% of the newborns were admitted with a mean birth weight of 2.81 ± 0.52 kg. There was no statistically significant correlation (p-value > 0.05) between the mother's body mass index and the birth weight or the APGAR score at 1 and 5 minutes. **Conclusions:** Oligohydramnios, a common pregnancy complication, is associated with an increased risk of adverse postnatal outcomes, indicative of fetal compromise. Vigilant fetal surveillance, regular antenatal care, and appropriate interventions may contribute to reducing perinatal morbidity and mortality.

Keywords

Perinatal Morbidity and Mortality, Oligohydramnios, Neonates, Pregnant Women

Oligohydramnios is characterized by an insufficient volume of amniotic fluid within the gestational sac, stands as a pivotal concern in the realm of obstetric care, prompting an in-depth investigation into its prognostic implications for both maternal well-being and fetal outcomes [1]. This research endeavours to unravel the intricate connections between oligohydramnios and the associated risks in term pregnancies.

Amniotic fluid plays a crucial role in the development of the fetal lungs and digestive system, offering protection to the fetus and providing essential nutrients [2]. Additionally, it possesses bacteriostatic properties. Throughout gestation, amniotic fluid acts as a safeguard against physical and biological harm while facilitating growth. Its volume peaks at 800-1000 ml between 28 to 32 weeks, gradually decreasing to 400 ml by 42 weeks. Ultrasonography, utilizing the amniotic fluid index (AFI) or single largest pocket (SLP), allows for straightforward measurement [3].

Antepartum surveillance programs aim not only to prevent maternal morbidity and mortality but also to enhance perinatal outcomes and reduce intrauterine fetal death risks [4]. Timely detection of fetal distress is imperative for safe delivery and the prevention of long-term neurological issues in the fetal central nervous system. Prenatal testing frequency, especially through ultrasound monitoring of amniotic fluid, adheres to established standards for high-risk pregnant women [5].

Various methods, including clinical palpation, measuring the single deepest vertical pocket, and using AFI, exist for amniotic fluid measurement. Oligohydramnios, a condition associated with heightened fetal morbidity, is often overlooked, leading to delayed care seeking and increased risks [6]. Early detection and intervention for oligohydramnios can contribute to a reduction in caesarean deliveries, lowering perinatal morbidity and mortality [7].

Maintaining an adequate level of amniotic fluid is crucial for appropriate fetal movement, growth, and protection of the fetus and umbilical cord [8]. Studies report oligohydramnios rates ranging from 0.5% to 8% among pregnant women globally. Adequate amniotic fluid volume, acting as a cushion for the fetus, helps reduce umbilical cord compression and supports fetal lung development [9].

An unusually low amniotic fluid volume, even though it varies with gestational age, has been linked to unfavourable pregnancy outcomes. Oligohydramnios, a severe condition occurring when amniotic fluid volume is excessively low (500 ml) between the 32nd and 36th weeks of pregnancy, poses risks for both mother and fetus [10]. Routine ultrasound usage has led to widespread diagnosis of oligohydramnios in apparently healthy pregnancies. In spite of this, there is a paucity of information on the mode of birth and pregnancy outcomes in our nation among women who have term oligohydramnios [11]. Therefore, the purpose of this study was to examine, in our particular situation, the newborn and maternal outcomes related to oligohydramnios.

Methodology

This cross-sectional study included all patients diagnosed with oligohydramnios. The initiation of data collection was contingent upon receiving approval from the hospital's ethical review committee. Enrolment of eligible patients was conducted using a non-probability consecutive sampling technique, ensuring that each participant received a comprehensive explanation of the study's procedures before providing written informed consent. Confidentiality protocols were strictly observed for both medical and non-medical information.

The study's target participant count was 80 people with oligohydramnios; the sample size was calculated using the sample size calculator provided by the World Health Organization. A 95% confidence level, a 1.5% expected population percentage (rate of oligohydramnios), and a 3% absolute precision level were among the parameters taken into consideration. Women between the ages of 19 and 41 years who were admitted for delivery made up the study population. Pregnancies with polyhydramnios, preterm deliveries before 37 weeks of gestation, or oligohydramnios linked to premature membrane rupture were excluded.

Demographic data, encompassing age, gestational age, and BMI, were systematically recorded. Clinical characteristics, obstetrical complications, and delivery methods were meticulously documented. Relevant outcomes, including caesarean section rates, stillbirth occurrences, birth weights, Apgar scores at 1 and 5 minutes, NICU hospitalization, and the presence of congenital anomalies, were thoroughly examined to evaluate both maternal and neonatal aspects during inpatient care.

IBM SPSS version 26 served as the tool for data entry and analysis. The acquired data were presented in both qualitative and quantitative formats, with frequencies and percentages representing the former and mean and standard deviation representing the latter. To compare birth weight and APGAR scores at 1 and 5 minutes based on BMI, a one-way ANOVA test was employed. The significance level was defined as a P-value ≤0.05.

Results

The study encompassed a diverse sample with a mean age of 27.86 ± 4.42 years and a mean gestational age of 38.53 ± 2.13 weeks. The majority of patients (73%) exhibited normal weight, while a substantial proportion of women (82%) reported no comorbid diseases. Merely 9% of participants had a history of oligohydramnios in a prior pregnancy. The predominant mode of delivery was via caesarean section, which was done in 92% of the women in the present study.

Regarding the outcomes for newborns, the average birth weight was 2.81 ± 0.52 kg. Remarkably, 15% of babies needed to be admitted to the Neonatal Intensive Care Unit (NICU), emphasizing how crucial postpartum care is. The mother's body mass index did not appear to have a statistically significant association (p-value > 0.05) with the assessment of birth weight and APGAR scores at 1 and 5 minutes, indicating that the mother's BMI did not have a meaningful impact on these newborn measures.

These findings provide valuable insights into the characteristics and outcomes of pregnancies complicated by oligohydramnios in the studied population. The high prevalence of caesarean section as the chosen delivery method and the absence of a significant association between maternal BMI and neonatal outcomes underscore the multifaceted nature of managing pregnancies affected by oligohydramnios. The data contribute to the broader understanding of factors influencing maternal and neonatal

health in this specific context.

Table 1: Demographics and Characteristics of the Patients.

Characteristic	Mean (± Standard Deviation) or Percentage
Age (Years)	27.86 ± 4.42
Gestational Age (Weeks)	38.53 ± 2.13
Body Mass Index (BMI)	23.65 ± 12.55
Normal Weight	73%
Comorbid Diseases	18%
History of Oligohydramnios (Previous Pregnancy)	9%

Table 2: Delivery method, neonatal outcomes, NICU admissions and association with maternal BMI

Characteristic	Percentage/Value
Delivery Method	
- Caesarean Section	92%
- Vaginal Delivery	8%
Neonatal Outcomes	
- Mean Birth Weight	2.61 ± 0.52 kg
- Mean Apgar Score at 1 minute	7.56 ± 0.85
- Mean Apgar Score at 5 minutes	8.23 ± 1.36
NICU Admissions	
- Yes	15%
- No	85%
Association with Maternal BMI	
- Birth Weight	p-value > 0.05
- Apgar Score at 1 minute	p-value = 0.932
- Apgar Score at 5 minute	p-value = 0.396

Discussion

The findings of this study shed light on various aspects of pregnancies complicated by oligohydramnios and contribute to our understanding of maternal and neonatal outcomes in such cases. The mean age of the study sample aligns with the typical age range for pregnancies, indicating a representative population. Similarly, the mean gestational age reflects pregnancies nearing full term, allowing for a focused examination of outcomes in the context of term pregnancies affected by oligohydramnios.

The high rate of caesarean section as the chosen delivery method in 92% of cases aligns with the literature's recognition of oligohydramnios as a condition necessitating careful management during childbirth [12,13]. The decision for caesarean section may be attributed to the perceived need for additional monitoring and intervention due to the potential complications associated with oligohydramnios [14].

The mean birth weight of 2.61 ± 0.52 kg falls within the expected range for term pregnancies. While 15% of infants required admission to the Neonatal Intensive Care Unit (NICU), this percentage, while notable, is not unexpectedly high given the known associations between oligohydramnios and adverse neonatal outcomes [15]. The findings regarding the history of oligohydramnios in previous pregnancies, at 9%, underscore the need for increased awareness and monitoring in subsequent pregnancies among women with a history of oligohydramnios. Early detection and proactive management may contribute to a reduction in adverse outcomes [16].

Another study conducted in different areas of the world suggests that along with adverse maternal outcomes of oligohydramnios, there is a prominent association of serious outcomes in neonates due to oligohydramnios, such as stillbirth, low birth weight, neonatal death and preterm birth [17].

It is imperative to recognize specific constraints associated with this research. The research's single-centre design might make it more difficult to extrapolate the results to a larger population. Furthermore, the retrospective nature of the study and its dependence on medical records raise the possibility of biases and limits on the completeness of the data.

This study provides valuable insights into the demographic and clinical characteristics of pregnancies complicated by oligohydramnios. The high rate of caesarean section and neonatal outcomes underscore the complexity of managing such pregnancies. Further multicentre studies with larger sample sizes are warranted to validate these findings and enhance our understanding of the nuanced factors influencing maternal and neonatal outcomes in oligohydramnios-affected pregnancies. These insights can inform clinical practices, improve antenatal care strategies, and contribute to better outcomes for both mothers and their newborns [18].

Conclusion

Oligohydramnios is linked to a higher risk for the baby in these women, but regular prenatal care appointments and the right monitoring of the baby can increase the chances of a safe birth and good results for both the mother and the baby. By finding and treating oligohydramnios early, the number of babies who get sick or die during pregnancy may go down. The only reason for a caesarean section is usually being told that the baby is too small for its gestational sac at full term. However, there was no noticeable change in care during pregnancy or after birth. When women are fully grown and have been told they have oligohydramnios, doctors may decide to start labour instead of performing a caesarean section.

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Conflict of Interest

None

Permission

It was taken from the committee.

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