CLINICAL CHARACTERISTICS OF PERINATAL OUTCOMES IN PREGNANCIES COMPLICATED BY OLIGOHYDRAMNIOS

Nozimjonova Ruxsora
Central Asian Medical University, International Medical University, Resident in Obstetrics and Gynecology

Scientific Supervisor: Ismailova Shoira Tolkunovna
PhD, Associate Professor, Head of the Department of Obstetrics, Gynecology, and Neonatology
Email: ismoilovasht7227@gmail.com
ORCID: https://orcid.org/0000-0002-9819-7563

Annotation. This study evaluates the clinical characteristics of perinatal outcomes in pregnancies complicated by oligohydramnios. Particular attention is given to fetal growth, fetal heart rate patterns, Doppler findings, mode of delivery, birth weight, Apgar scores, and the need for additional neonatal care. Oligohydramnios may be associated with fetal growth restriction, impaired placental function, non-reassuring fetal status, and an increased need for obstetric intervention in selected cases. Early identification of high-risk pregnancies through ultrasound assessment, fetal growth monitoring, Doppler examination, and appropriate antenatal surveillance may facilitate timely clinical decision-making. The assessment of maternal and fetal factors together provides a more comprehensive understanding of perinatal risk than evaluation of amniotic fluid volume alone.

Keywords: Oligohydramnios, pregnancy, perinatal outcomes, fetal growth, fetal monitoring, Doppler assessment, neonatal outcomes, obstetric management.

Introduction

Oligohydramnios, characterized by a reduced volume of amniotic fluid during pregnancy, is an important obstetric condition that may influence fetal well-being and perinatal outcomes. Amniotic fluid provides a protective intrauterine environment, facilitates fetal movement, and helps prevent excessive compression of the umbilical cord. A significant reduction in its volume may occur in association with placental

dysfunction, fetal growth restriction, premature rupture of membranes, maternal hypertension, or other pregnancy-related conditions.

Therefore, identification of oligohydramnios requires careful assessment of both amniotic fluid volume and the overall maternal and fetal condition. The clinical significance of oligohydramnios depends on gestational age, the degree and duration of fluid reduction, fetal growth, placental function, and the presence of additional maternal or fetal risk factors. In some pregnancies, reduced amniotic fluid may be associated with non-reassuring fetal heart rate patterns, meconium-stained amniotic fluid, induction of labor, operative delivery, lower Apgar scores, and increased neonatal observation requirements. However, these outcomes are not observed uniformly in all cases, particularly when oligohydramnios is isolated. This variability emphasizes the need for individualized assessment rather than relying solely on the diagnosis itself. Evaluation of perinatal outcomes in pregnancies complicated by oligohydramnios should include fetal growth, fetal heart rate patterns, mode of delivery, birth weight, Apgar scores, neonatal adaptation, and the need for specialized neonatal care. Ultrasound assessment of amniotic fluid and fetal growth, together with appropriate fetal surveillance, can help identify pregnancies at increased risk of adverse outcomes. Dynamic monitoring is particularly important when oligohydramnios persists or is accompanied by additional clinical abnormalities. A comprehensive evaluation of perinatal outcomes may therefore contribute to earlier recognition of fetal compromise, better selection of obstetric management, and improved maternal and neonatal care.

Relevance

Oligohydramnios is an important obstetric condition because a reduced volume of amniotic fluid may be associated with changes in fetal well-being and unfavorable perinatal outcomes. The risk may be influenced by gestational age, severity of oligohydramnios, fetal growth, placental function, and additional maternal or fetal complications. Clinical assessment of these pregnancies is therefore important for identifying fetuses at increased risk of complications. Ultrasound evaluation of amniotic fluid and fetal growth, together with appropriate fetal heart rate monitoring

and Doppler assessment when indicated, can support timely recognition of fetal compromise.

Aim

To evaluate the clinical characteristics of perinatal outcomes in pregnancies complicated by oligohydramnios, identify the main maternal and fetal factors associated with adverse outcomes, and assess the importance of antenatal monitoring in improving perinatal care.

Main part

Oligohydramnios is a condition characterized by a reduction in amniotic fluid volume below the expected level for gestational age. It may develop as an isolated finding or in association with maternal, fetal, placental, or pregnancy-related disorders. Common clinical associations include placental dysfunction, fetal growth restriction, premature rupture of membranes, maternal hypertensive disorders, and certain fetal abnormalities. In some cases, no clear underlying cause can be identified. The clinical importance of oligohydramnios is related to the protective functions of amniotic fluid, including facilitation of fetal movement and reduction of mechanical compression of the umbilical cord. A significant decrease in fluid volume may therefore influence fetal well-being, particularly during uterine contractions. The severity and duration of oligohydramnios are important when assessing its potential clinical consequences. Early diagnosis allows the maternal and fetal condition to be evaluated more carefully. Clinical assessment should include gestational age, maternal medical history, fetal growth, placental condition, and evidence of membrane rupture. The diagnosis should not be considered independently from the overall pregnancy status. Women with additional risk factors may require closer surveillance than those with isolated and mild fluid reduction. The distinction between isolated oligohydramnios and oligohydramnios associated with placental or fetal pathology is particularly important. Individualized evaluation may help determine the appropriate frequency of antenatal monitoring. Understanding the causes and clinical significance of oligohydramnios provides a basis for predicting potential complications. It also supports more rational decisions regarding continued pregnancy surveillance and delivery planning.

Assessment of fetal well-being is a central component of antenatal care in pregnancies complicated by oligohydramnios. Ultrasound examination provides important information about amniotic fluid volume, fetal biometric parameters, fetal growth, placental characteristics, and general intrauterine development. Fetal abdominal circumference, head measurements, and femur length can be used to evaluate growth according to gestational age. Serial assessment is particularly useful when oligohydramnios persists because fetal condition may change during pregnancy. Growth restriction should be considered carefully because reduced amniotic fluid may occur together with impaired placental function. Doppler assessment can provide additional information about uteroplacental and fetoplacental circulation when there are clinical indications of placental dysfunction or fetal growth abnormalities. Evaluation of fetal heart rate may also contribute to the assessment of fetal adaptation, especially in pregnancies considered to be at increased risk. The interpretation of these findings should be based on the overall clinical condition rather than on a single measurement. Repeated monitoring allows changes to be identified earlier and may assist in determining whether pregnancy surveillance should be intensified. Maternal blood pressure, symptoms, and other pregnancy-related complications should be assessed at the same time. The frequency of fetal assessment should be individualized according to gestational age and associated risk factors. Comprehensive monitoring is especially important when oligohydramnios is accompanied by fetal growth restriction or other maternal complications.

Reduced amniotic fluid may influence the clinical course of labor and increase the need for closer intrapartum surveillance. During uterine contractions, decreased fluid volume can provide less protection for the umbilical cord and may increase the possibility of cord compression. This may be reflected by non-reassuring fetal heart rate patterns during labor. Oligohydramnios may also be associated with an increased frequency of labor induction, particularly when clinicians consider the risks of continuing pregnancy to be greater than the expected benefits. The progression of labor should be assessed carefully because prolonged labor or inadequate progress may occur in some patients. Meconium-stained amniotic fluid may also be observed and can be

associated with additional fetal surveillance requirements. The mode of delivery should be determined according to the maternal and fetal clinical condition rather than the diagnosis of oligohydramnios alone. Vaginal delivery may remain appropriate when fetal status is reassuring and there are no other obstetric contraindications. Cesarean delivery may become necessary when fetal compromise, failed induction, or another obstetric indication develops. Continuous or repeated fetal heart rate assessment during labor can facilitate early recognition of deterioration. Maternal condition, cervical progress, contraction pattern, and fetal response should be evaluated together. The decision to intervene should therefore be based on a comprehensive clinical assessment. Oligohydramnios should not automatically be interpreted as an indication for operative delivery. Instead, it should be considered a factor that may modify the level of obstetric surveillance and decision-making. Careful intrapartum management can help reduce avoidable complications.

Perinatal outcomes provide important information about the clinical significance of oligohydramnios and the effectiveness of antenatal management. Newborn assessment should include birth weight, gestational age at delivery, Apgar scores, early neonatal adaptation, and the requirement for additional medical support. Some pregnancies complicated by oligohydramnios may result in fetal growth restriction, which can influence neonatal condition after birth. Lower birth weight may be observed particularly when reduced amniotic fluid is associated with placental dysfunction. During labor, fetal compromise may contribute to lower Apgar scores or increased need for neonatal observation. Meconium exposure may also require additional assessment of respiratory adaptation after delivery. However, isolated oligohydramnios does not necessarily lead to poor neonatal outcomes in every pregnancy. The clinical impact varies according to gestational age, severity of fluid reduction, fetal growth, and associated maternal or placental abnormalities. Therefore, perinatal outcomes should be interpreted within the broader clinical context. Comparison of neonatal indicators between different clinical groups can help determine which factors are associated with unfavorable outcomes. Early identification of high-risk pregnancies may permit closer surveillance and appropriate timing of

delivery. Neonatal teams should be informed when there is a significant possibility of fetal compromise or neonatal adaptation problems. Evaluation of perinatal outcomes also helps identify areas where antenatal or intrapartum management can be improved. A structured assessment can include both immediate neonatal parameters and the need for specialized care. Such information is useful for clinical decision-making and future preventive strategies.

Management of oligohydramnios should be individualized according to gestational age, severity of amniotic fluid reduction, maternal condition, fetal growth, and associated complications. The first step is to determine whether the condition is isolated or related to placental dysfunction, membrane rupture, fetal abnormalities, or maternal disease. Appropriate antenatal surveillance should then be established according to the patient's individual risk profile. Ultrasound monitoring of fetal growth and amniotic fluid provides important information during follow-up. Additional fetal assessment may be required when clinical findings suggest increased risk of compromise. Maternal blood pressure and other relevant clinical parameters should be monitored when associated hypertensive or systemic conditions are present. Supportive measures, including appropriate hydration when clinically suitable, may be considered as part of individualized care, although management should primarily focus on the underlying cause and overall maternal-fetal status. The timing of delivery should be determined by balancing the risks of continued pregnancy against the risks associated with earlier birth. During labor, fetal monitoring is important because changes in fetal heart rate may develop in association with reduced fluid volume. The choice of delivery method should be based on fetal condition, gestational age, cervical status, and other obstetric indications. Preparation for neonatal care is also important when there is an increased risk of fetal compromise or neonatal adaptation problems. Postnatal assessment can provide additional information about the clinical course and potential complications. Continuous reassessment allows management to be adjusted as pregnancy progresses. Individualized care can reduce unnecessary interventions while ensuring timely action when deterioration occurs. Therefore, a comprehensive strategy combining early diagnosis, dynamic fetal monitoring, appropriate obstetric

decision-making, and neonatal preparedness is essential for reducing adverse perinatal outcomes in pregnancies complicated by oligohydramnios.

Results

The study included 25 pregnant women with oligohydramnios who were monitored during pregnancy and delivery. The average maternal age was 29 years, and the average gestational age at delivery was 38 weeks. Oligohydramnios was diagnosed before 37 weeks in 7 women (28%) and at term in 18 women (72%). Fetal growth restriction was identified in 4 cases (16%), while 21 pregnancies (84%) showed appropriate fetal growth. Non-reassuring fetal heart rate patterns were observed in 5 women (20%), and abnormal Doppler findings were detected in 4 cases (16%).

During labor, 8 women (32%) required induction, while 17 (68%) entered spontaneous labor. Prolonged labor occurred in 4 cases (16%), and meconium-stained amniotic fluid was observed in 3 cases (12%). Cesarean delivery was performed in 6 women (24%), while 18 (72%) had spontaneous vaginal delivery and 1 (4%) underwent operative vaginal delivery. Fetal distress was the main indication for cesarean delivery in 3 cases (50%).

The average neonatal birth weight was 3,020 g. Birth weight below 2500 g was recorded in 3 newborns (12%), while 22 newborns (88%) had a birth weight of 2500 g or more. An Apgar score below 7 at 5 minutes was observed in 3 newborns (12%). Additional neonatal observation or specialized care was required in 3 cases (12%), including respiratory adaptation problems in 2 newborns (8%). Overall, the findings indicate that pregnancies complicated by oligohydramnios require careful antenatal surveillance and individualized obstetric management, particularly when fetal growth restriction or abnormal fetal monitoring is present.

Discussion

The findings of this study indicate that oligohydramnios may be associated with several clinically important obstetric and perinatal outcomes. In the group of 25 pregnant women, fetal growth restriction and abnormal fetal monitoring were observed in a proportion of cases, demonstrating the importance of continuous assessment of fetal well-being. The presence of non-reassuring fetal heart rate patterns and abnormal

Doppler findings may reflect impaired placental function or reduced tolerance of the fetus to the stress of late pregnancy and labor. The relatively frequent need for labor induction also emphasizes the importance of individualized obstetric decision-making in pregnancies complicated by reduced amniotic fluid. Prolonged labor and meconium-stained amniotic fluid were observed in several patients, which may indicate an increased need for careful intrapartum monitoring. Although most women delivered vaginally, cesarean delivery was required in some cases, primarily because of fetal distress. Neonatal outcomes were generally favorable in the majority of cases, but several newborns had lower Apgar scores or required additional observation. These findings suggest that oligohydramnios does not necessarily result in adverse neonatal outcomes in every pregnancy, but the presence of additional risk factors may increase the likelihood of complications. Fetal growth, Doppler parameters, fetal heart rate, gestational age, and maternal clinical condition should therefore be assessed together rather than individually. Early identification of abnormal findings allows timely intensification of surveillance and adjustment of delivery planning. Overall, the results support a personalized approach to pregnancies complicated by oligohydramnios, with particular attention to pregnancies accompanied by fetal growth restriction or evidence of placental dysfunction.

Conclusion

Pregnancies complicated by oligohydramnios require careful fetal surveillance and individualized assessment of perinatal risk. The findings of this study demonstrated that fetal growth restriction, non-reassuring fetal heart rate patterns, abnormal Doppler findings, and certain labor complications may occur in these pregnancies. Therefore, regular ultrasound examination, Doppler assessment, and fetal heart rate monitoring are important for the early detection of fetal compromise. Oligohydramnios does not inevitably result in adverse perinatal outcomes; however, the presence of additional maternal, placental, or fetal risk factors may increase the likelihood of complications. Consequently, gestational age, fetal growth, placental blood flow, fetal condition, and maternal clinical status should be assessed comprehensively when determining the timing and mode of delivery. Individualized and dynamic monitoring may help identify

complications at an early stage and contribute to better maternal and neonatal outcomes.

References

1. Dammer U., Pretscher J., Weiss C. et al. Perinatal outcome in pregnant women with isolated oligohydramnios diagnosed with the single deepest pocket method // In Vivo. - 2024. - Vol. 38, No. 2. - P. 754–760.

2. Sgayer I., Elafawi M., Braude O. et al. Perinatal outcomes of pregnancies with borderline oligohydramnios at term // Fetal Diagnosis and Therapy. - 2025. - Vol. 52, No. 1. - P. 59–64.

3. Sgayer I., Kayal R.S., Ganem N. et al. Association between borderline amniotic fluid levels and adverse perinatal outcome: systematic review and meta-analysis // Ultrasound in Obstetrics & Gynecology. - 2025. - Vol. 66, No. 5. - P. 562–570.

4. Rabie N., Magann E., Steelman S., Ounpraseuth S. Oligohydramnios in complicated and uncomplicated pregnancy: a systematic review and meta-analysis // Ultrasound in Obstetrics & Gynecology. - 2017. - Vol. 49, No. 4. - P. 442–449.

5. Shrem G., Nagawkar S.S., Hallak M., Walfisch A. Isolated oligohydramnios at term as an indication for labor induction: a systematic review and meta-analysis // Fetal Diagnosis and Therapy. - 2016. - Vol. 40, No. 3. - P. 161–173.

6. Rossi A.C., Prefumo F. Perinatal outcomes of isolated oligohydramnios at term and post-term pregnancy: systematic review and meta-analysis // European Journal of Obstetrics & Gynecology and Reproductive Biology. - 2013. - Vol. 169, No. 2. - P. 149–154.

7. Morris R.K., Cnossen J.S., Langejans M. et al. Association and prediction of amniotic fluid measurements for adverse pregnancy outcome: systematic review and meta-analysis // BJOG: An International Journal of Obstetrics & Gynaecology. - 2014. - Vol. 121, No. 6. - P. 686–699.