Original Article

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

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Abstract

Objective: To investigate oligohydramnios as prognostic factor for maternal risk in term pregnancy and its fetal outcome.
Methodology: This descriptive cross sectional study was conducted in the department of Obstetrics and Gynecology Combined Military Hospital, Muzaffarabad in a period of one year from October 2021 to October 2022.
All of the patients with an oligohydramnios diagnosis were included in this cross-sectional research. Patients who met our selection criteria were enrolled utilizing a non-probability consecutive sampling procedure. Every person who was selected was informed about the study's methodology, and the researcher acquired their signed informed consent. The following were noted: demographic data, patient clinical traits, obstetrical problems, and delivery method. Maternal and newborn outcomes during inpatient care were examined and recorded.
Results: The main age of study sample was 27.73 ± 4.75 years and mean gestational age was 38.42 ± 2.20 weeks. Majority 73.4% of the patients had normal weight and most of the women (82.8%) had no comorbid disease. Only (9.4%) of the women in the study had a history of oligohydramnios in previous pregnancy. Most of the women (92.2%) in the study sample delivered with caesarian section. The mean birth weight of the babies was 2.77 ± 0.51 kg. 10 (15.6%) babies required admission to NICU. The birth weight and APGAR score at 1 and 5 minutes did not show any significant (p-value > 0.05) association with body mass index of the mother.
Conclusions: Oligohydramnios is a frequent pregnancy issue that has been linked to an elevated risk of unfavorable postnatal outcomes since it is thought to be a sign of foetal impairment. With proper foetal surveillance, frequent antenatal care visits, and other measures may help to reduce perinatal morbidity and mortality.
Key words: Oligohydramnios, Maternal outcome, Fetal outcome, Term pregnancy.

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Introduction

Amniotic fluid is crucial for the development of the lungs and digestive system, as well as for protecting the foetus and supplying nutrients. Moreover, it has bacteriostatic qualities. The amniotic fluid cushions the developing foetus against physical and biological harm while promoting growth. From 28 to 32 weeks, the amniotic volume peaks at 800-1000 ml, then gradually declines and plateaus until it reaches just 400 ml at 42 weeks. By using the amniotic fluid index (AFI) or the single largest pocket, ultrasonography makes it simple to measure amniotic fluid (SLP). The amount of amniotic fluid is determined by summing the biggest pockets from all four equally sized uterine quadrants.[1,2]

In addition to preventing maternal morbidity and mortality, the ultimate goal of the antepartum surveillance programme is to improve perinatal outcome and reduce intrauterine foetal death. Early detection of a distressed foetus is essential in order to deliver the baby safely and avoid long-term neurological problems such damage to the foetal central nervous system.[3] There are established standards for how frequently high-risk pregnant women should undergo prenatal testing, and

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amniotic fluid monitoring by ultrasound is one of the crucial instruments for evaluating the foetal health across all risk categories, particularly beyond the viability phase.[4] The amount of amniotic fluid can be measured in a number of ways, including by clinical palpation, measuring the single deepest vertical pocket, and using the amniotic fluid index (AFI).[5]

Oligohydramnios is a disease that poses a risk to the health of the foetus and is linked to higher foetal morbidity. These problems are frequently overlooked, and patients may not seek the proper care at the right time, which frequently raises the chance of developing a number of conditions. Early oligohydramnios detection and therapy may contribute to a drop in caesarean deliveries and a reduction in perinatal morbidity and mortality. To allow for appropriate foetal movement and growth as well as to protect the foetus and umbilical cord, an adequate level of amniotic fluid is essential.[6] According to several research, oligohydramnios rates among pregnant women have been reported to range from 0.5 to 8% in various nations.[7,8]

One of the most crucial elements of a healthy pregnancy is an adequate amount of amniotic fluid because it serves as a cushion for the foetus, reduces compression of the umbilical cord, and aids in the development of the fetus's lungs.[1] Atypically low amniotic fluid volume has been linked to unfavorable pregnancy outcomes, even though the average amniotic fluid volume changes with gestational age. A severe condition for both the mother and the foetus is oligohydramnios, which occurs when the amniotic fluid volume is excessively low (500 ml) between the 32nd and 36th weeks of pregnancy.[8]

The diagnosis of oligohydramnios in apparently healthy pregnancies is widespread with the routine use of ultrasonography in low-risk pregnancies. On the mode of birth and pregnancy outcomes in women with oligohydramnios at term in our country, not much has been written. This study was designed to investigate the neonatal and maternal outcomes of oligohydramnios in our setup.

Methodology

All oligohydramnios patients who visited the Obstetrics and Gynecology Department at the Joint Military Hospital in Muzaffarabad were included in this cross-sectional study. The patients were chosen over the course of a year, and enrollment took place from October 2021 to October 2022. The data collection process for this was started after the hospital ethical review committee approved the project. Patients who met our selection criteria were enrolled utilizing a non-probability consecutive sampling procedure. Each participant was given a detailed explanation of the study's methods before the researcher got their written informed permission. Confidentiality was maintained with regard to both their medical and non-medical information. For the study, a total of 64 oligohydramnios individuals will be chosen. With the WHO sample size calculator, the sample size for the study was determined using the following parameters: confidence level of 95%, predicted population proportion (rate of oligohydramnios), 1.5%, and absolute precision level of 3%. The sample consisted of all women admitted for delivery between the ages of 18 and 40. Any pregnancies with polyhydramnios, premature delivery (37 weeks' gestation), or oligohydramnios linked to preterm membrane rupture were not selected from the study.

Age, gestational age, and BMI were recorded as demographic data. Patients' clinical traits, obstetrical problems, and method of delivery were noted. Including delivery method, caesarean section, still birth, birth weight, Apgar scores at 1 and 5 minutes, NICU hospitalization, and congenital anomalies were reported, inpatient maternal and neonate outcomes were examined.

IBM SPSS version 26 was used to enter and evaluate all of the acquired data. Both qualitative and quantitative data were given as frequency and percentages, with the former taking the form of mean and standard deviation. On the basis of BMI, a one-way ANOVA test was used to compare birth weight and APGAR scores at 1 and 5 minutes. Significant level was defined as P-value ≤0.05.

Results

In this cross sectional study, a total of 64 patients of oligohydroaminosis were enrolled. The man age of study sample was 27.73 ± 4.75 years and mean gestational age was 38.42 ± 2.20 weeks. Majority 73.4% of the patients had normal weight on the basis of BMI distribution and 15.6% were overweight. Main bulk (92.2%) of the pregnant women in this study had no history of use of any medicine. Most of the women (82.8%) had not comorbid disease and among patients having any comorbid, the most common comorbid disease was PIH in (14.1%) women in the study sample. History of PROM was very common among these women and (51.6%) women presented with PROM. Only (9.4%) of the women in the study had a history of

oligohydramnios in previous pregnancy. Most of the women (92.2%) in the study sample delivered with caesarian section as elaborated in table I.

In whole sample one women (1.6%) delivered a stillbirth. The mean birth weight of the babies was 2.77 ± 0.51 kg. The mean APGAR score at one minute was recorded as 7.64 ± 0.764 and at 5 minutes it was noted to be 8.34 ± 1.06. Among these babies delivered to the women with oligohydramnios 10 (15.6%) babies required admission to NICU and one baby (1.6%) delivered with congenital anomaly as shown in table II.

Table I: Distribution of demographic variables in the sample

Variables	N	%
Age of the patients		
Mean ± SD	27.73 ± 4.75	
Gestational age (Weeks)		
Mean ± SD	38.42 ± 2.20	
Maternal Body Mass Index (BMI)		
Underweight (< 18.5)	7	10.9
Healthy (18.5-24.9)	47	73.4
Overweight (25.0-29.9)	10	15.6
Drug Use During Pregnancy		
None	59	92.2
NSAIDs	0	0.0
Others	5	7.8
Comorbid Disease		
GDM	2	3.1
PIH	9	14.1
None	53	82.8
History of PROM		
Yes	33	51.6
No	31	48.4
History of Oligohydramnios's in previous pregnancy		
Yes	6	9.4
No	58	90.6
Mode of delivery		
Vaginal birth	5	7.8
Caesarean section	59	92.2
Total	**64**	**100.0**

The birth weight of these babies born to the mother having oligohydramnios did not show any significant (p-value > 0.05) association with body mass index of the mother. Similarly, the APGAR scores at 1 minute and 5 minutes also did not had any relationship with maternal body mass index with insignificant (p-value > 0.05) p-values as elaborated in table III.

Table II: Distribution of fetal characteristics the study sample.

Variables	N	%
Stillbirth		
Yes	1	1.6
No	63	98.4
Birth Weight (Kg)		
Mean ± SD	2.77 ± 0.51	
APGAR score at 1 minute		
Mean ± SD	7.64 ± 0.764	
APGAR score at 5 minutes		
Mean ± SD	8.34 ± 1.06	
Admission to NICU		
Yes	10	15.6
No	54	84.4
Congenital Anomalies		
Yes	1	1.6
No	63	98.4

Discussion

Oligohydramnios is linked to higher foetal risk in these women, but there are ways to increase the likelihood of a safe delivery and favourable fetomaternal outcome. Uncertainty surrounds the pathogenic significance of solitary oligohydramnios in the natural history. It has been suggested that placental insufficiency is the primary cause of decreased amniotic fluid volume; however, it is also believed that compensatory redistribution of foetal blood flow, which results in renal hypoperfusion, is the cause of the development of oligohydramnios in the post-term period.[9,10]

Oligohydramnios has an impact on the composite newborn morbidity parameter, which includes neonatal

Table III: Comparison of foetal outcome on the basis of BMI

Foetal outcome	BMI	N	Mean	SD	P-value
Birth Weight (Kg)	Underweight (< 18.5)	7	2.53	0.24	0.087
	Healthy (18.5-24.9)	47	2.74	0.53	
	Overweight (25.0-29.9)	10	3.06	0.50	
	Total	64	2.77	0.51	
APGAR score at 1 minute	Underweight (< 18.5)	7	7.71	0.49	0.921
	Healthy (18.5-24.9)	47	7.62	0.85	
	Overweight (25.0-29.9)	10	7.70	0.48	
	Total	64	7.64	0.76	
APGAR score at 5 minutes	Underweight (< 18.5)	7	8.86	1.07	0.388
	Healthy (18.5-24.9)	47	8.30	1.10	
	Overweight (25.0-29.9)	10	8.20	0.79	
	Total	64	8.34	1.06	

death, umbilical cord pH, foetal distress, foetal anemia, and hypoglycemia. The link between AFI and a poor perinatal outcome has been disputed because of the complex interactions between various pregnancy problems, especially in preterm patients.[11] On the other hand, a systematic study and meta-analysis of isolated oligohydramnios at term revealed noticeably greater rates of caesarean sections, labour induction, and short-term infant morbidity such low Apgar scores and NICU admissions. While some researchers found no correlation, some have connected oligohydramnios with poor foetal and maternal outcomes in pregnancies complicated by growth-restricted fetuses.[13]

This present study was planned to explore the perinatal and maternal outcomes of oligohydramnios in our setup. For this purpose, a sample of 64 patients of oligohydroaminosis was selected. The mean age of the study sample was 27.73 ± 4.75 years and mean gestational age was 38.42 ± 2.20 weeks. Majority 73.4%

of the patients had normal weight on the basis of BMI distribution and 15.6% were overweight. Among the study sample of this present study most of the women (82.8%) had no comorbid disease and among patients having any comorbid, the most common comorbid

disease was PIH (14.1%) women in the study sample. These results are in accordance with previous studies like a study by Bukh H, et al, who also found that 14.8% of the sample had different chronic medical illness.[14] In this study no association of BMI was found with oligohydroamnios as support this finding by other studies in the literature.[15]

In the present study it was observed that history of PROM was very common among these women in the study and (51.6%) women presented with PROM. Only (9.4%) of the women in the study had a history of oligohydramnios in previous pregnancy. Most of the women (92.2%) in the study sample delivered with caesarian section. Many studies demonstrated that the rate of caesarian section delivery increases significantly in women presented with oligohydramnios like in a study by Bachhav et al in their prospective According to a study, isolated oligohydramnios between weeks 37 and 42 of pregnancy is linked to a statistically significant increase in caesarean sections (66%) but the rate in this present study was found to be even more higher.[16] Oligohydramnios is a frequent pregnancy issue that has been linked to an increased risk of unfavourable postnatal outcomes since it is thought to be a sign of foetal impairment.[17]

The results of the present study revealed that in whole sample one women (1.6%) delivered a stillbirth. The mean birth weight of the babies was 2.77 ± 0.51 kg. Literature shows that there is no significant association of birth weight with oligohydramnios and similar results were found in this present study in which mean birth weight of the babies was within the normal limits.[18]

The mean APGAR score at one minute was recorded as 7.64 ± 0.764 and at 5 minutes it was noted to be 8.34 ± 1.06. Among these babies delivered to the women with oligohydramnios 10 (15.6%) babies required admission to NICU and one baby (1.6%) delivered with congenital anomaly. Some studies have found a significant relationship of lack of amniotic fluid at term to be associated with a number of adverse fetal outcomes including low APGAR score and higher rate of NICU admissions but in this present study mean APGAR score at 1 minute and 5 minutes was found to be in normal limits that is higher than 7. Few studies also found no relationship of APGAR score and oligohydramnios.[19,20]

Although oligohydramnios was found to be associated with a variety of adverse maternal, foetal, and neonatal outcomes[21] and that women with oligohydramnios frequently had worse outcomes than women without oligohydramnios, the findings of this study did not support the notion that diagnosing oligohydramnios during pregnancy can improve fetomaternal outcomes. Studies from high-income nations have suggested that treating some oligohydramnios patients may improve some outcomes[22], although it is unclear if amnioinfusion, early delivery, or delivery by caesarean section would produce results that are comparable.[23]

Conclusion

Although oligohydramnios is linked to a higher foetal risk in these women, regular antenatal care appointments and appropriate foetal surveillance can increase the likelihood of a safe birth and favorable fetomaternal outcomes. Reduced perinatal morbidity and death may result from early detection and treatment of oligohydramnios. The only justification for a caesarian delivery is frequently the diagnosis of oligohydramnios at term. Yet, there was no appreciable improvement in perinatal or neonatal care. When women are diagnosed with oligohydramnios at term, the statistics may give doctors reason to induce labor rather than caesarian delivery.

References

1. Ghimire S, Ghimire A, Chapagain S, Paudel S. Pregnancy outcome in cases of oligohydramnios after 28 weeks of gestation. Int J Advanc Medic Heal Resea. 2016;3(2):68.
2. Bansal V, Bansal A, Bansal AK. Effectiveness of L-arginine in oligohydramnios on amniotic fluid index. Wor J Pharmaceut Resear. 2015;4(8):1354-8.
3. Hebbar S, Rai L, Adiga P, Guruvare S. Reference ranges of amniotic fluid index in late third trimester of pregnancy: what should the optimal interval between two ultrasound examinations be? J Pregnancy. 2015;2015:319204.
4. Nash P. Amniotic fluid index. Neonatal Network. 2013;32(1):46–9.
5. Dubil EA. Amniotic fluid as a vital sign for fetal wellbeing. Australas. J. Ultrasound Med. 203;16(2):62–70.
6. Khatun T, Ansari AA, Hamid I, Gupta RS, Ahmad MP. Oligohydramnios and fetal outcome: A Review. Med Phoenix. 2016;1(1):23-30
7. Han CS. Fetal Biophysical Profile. Obstet Imaging Fetal Diagnosis Care. Elsevier; 2018;537-40.
8. Figueroa L, McClure EM, Swanson J, Nathan R, Garces AL, Moore JL, et al. Oligohydramnios: a prospective study of fetal, neonatal and maternal outcomes in low-middle income countries. Reprod Health. 2020;17(1):19.
9. Bauserman M, Nathan R, Lokangaka A, McClure EM, Moore J, Ishoso D, et al. Polyhydramnios among women in a cluster-randomized trial of ultrasound during prenatal care within five low and low-middle income countries: a secondary analysis of the first look study. BMC Pregnancy Childbirth. 2019;19(1):258.
9. Hou L, Wang X, Hellerstein S, Zou L, Ruan Y, Zhang W. Delivery mode and perinatal outcomes after diagnosis of oligohydramnios at term in China. J Matern Fetal Neonatal Med. 2020;33(14):2408-14.
10. Bakhsh H, Alenizy H, Alenazi S, Alnasser S, Alanazi N, Alsowinea M, et al. Amniotic fluid disorders and the effects on prenatal outcome: a retrospective cohort study. BMC Pregnancy Childbirth. 2021;21(1):75.
11. Sasahara J, Ishii K, Umehara N, Oba M, Kiyoshi K, Murakoshi T, et al. Significance of oligohydramnios in preterm small-for-gestational-age infants for outcome at 18 months of age. J Obstet Gynaecol Res. 2016;42:1451-6.
12. Rabinovich A, Holtzman K, Shoham-Vardi I, Mazor M, Erez O. Oligohydramnios is an independent risk factor for perinatal morbidity among women with pre-eclampsia who delivered preterm. J Matern Fetal Neonatal Med. 2019;32(11):1776-82.
13. Rabie N, Magann E, Steelman S, Ounpraseuth S. Oligohydramnios in complicated and uncomplicated pregnancy: a systematic review and meta-analysis. Ultrasound Obstet Gynecol. 2017;49(4):442-9.
14. Bakhsh H, Alenizy H, Alenazi S, Alnasser S, AlanaziN, Alsowinea M, et al. Amniotic fluid disorders and the effects on prenatal outcome: a retrospective cohort study. BMC Pregnancy and Childbirth. 2021;21:75.
15. Alqarni M. A review of prevalence of obesity in Saudi Arabia. J Obes Eat Disord. 2016;2(2):25.
16. Bachhav AA, Waikar M. Low Amniotic Fluid Index at Term as a Predictor of Adverse Perinatal Outcome. J Obstet Gynecol India. 2014;64(2):120–3.
17. Tahmina S, Prakash S, Daniel M. Maternal and perinatal outcomes of induction of labor in oligohydramnios at term-a retrospective cohort study. J Matern Fetal Neonatal Med. 2020;33(13):2190-4.
18. Levin G, Rottenstreich A, Tsur A, Cahan T, Shai D, Meyer R. Isolated oligohydramnios - should induction be offered after 36 weeks? J Matern Fetal Neonatal Med. 2022;35(23):4507-12.
19. Rossi AC, Prefumo F. Perinatal outcomes of isolated oligohydramnios at term and post-term pregnancy: a systematic review of literature with meta-analysis. Eur J Obstet Gynecol Reprod Biol. 2013;169:149–54.
20. Rydahl E, Eriksen L, Juhl M. Effects of induction of labor prior to post-term in low-risk pregnancies: a systematic review. JBI Database System Rev Implement Rep. 2019;17(2):170-208.
21. Nathan RO, Swanson JO, Swanson DL, McClure EM, Bolamba VL, Lokangaka A, et al. Evaluation of focused obstetric ultrasound examinations by health care personnel in the Democratic Republic of Congo, Guatemala, Kenya, Pakistan, and Zambia. Curr Probl Diagn Radiol. 2017;46:210–5.
22. Swanson JO, Plotner D, Franklin HL. Web-based quality assurance process drives improvements in obstetric ultrasound in 5 low- and middle income countries. Glob Heal Sci Pract. 2016;4:675–83.
23. Figueroa L, McClure EM, Swanson J, Nathan R, Garces AL, Moore JL et al. Oligohydramnios: a prospective study of fetal, neonatal and maternal outcomes in low-middle income countries. Reproduct Health. 2020;17:19.