

## Frequency of Risk Factors and Outcomes of Pregnancy with Oligohydramnios at a Tertiary Care Hospital – An Observational Study from Bangladesh

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**Abstract:** *Introduction:* Oligohydramnios, a common amniotic fluid disorder, is marked by reduced fluid volume for gestational age. This study aims to assess its risk factors and clinical outcomes to enhance maternal and neonatal care in a tertiary hospital in Bangladesh. *Aim of the study:* The aim of the study was to evaluate the frequency of risk factors and clinical outcomes in pregnancies with oligohydramnios at a tertiary care hospital in Bangladesh. *Methods:* This prospective observational study was conducted in the Department of Obstetrics and Gynecology at BSMMU, Dhaka, from June 1, 2016, to May 31, 2017, enrolling 200 pregnant women with oligohydramnios. Data on antenatal and postnatal histories, clinical examinations, and investigations were collected. SPSS version 22.0 was used for descriptive analysis of demographics, maternal and neonatal outcomes, and risk factors. *Result:* In a study of 200 pregnant women with oligohydramnios, the mean age was 23.9 years, with 65.5% aged 20-25. The most common risk factor was idiopathic oligohydramnios at 24.0%. Maternal outcomes revealed 58.0% had normal vaginal deliveries and 42.0% cesarean sections, primarily due to fetal distress. Among neonates, 54.5% were appropriate for gestational age, 70.9% had low birth weight, and 65.4% had APGAR scores below 7 at 1 minute. *Conclusion:* Oligohydramnios is a prevalent complication in pregnancies that requires vigilant monitoring and timely interventions to improve maternal and neonatal outcomes, given its association with low birth weight and increased cesarean delivery rates.

**Keywords:** Oligohydramnios, risk factors, pregnancy outcomes, tertiary care hospital, Bangladesh.

### INTRODUCTION

Oligohydramnios, the most common amniotic fluid disorder, is characterized by a reduction in amniotic fluid volume below the expected level for gestational age.[1] Evaluating amniotic fluid during antenatal fetal surveillance is essential for assessing fetal well-being.[2] Reduced fluid volume is associated with higher risks of intrauterine growth restriction, meconium aspiration syndrome, severe birth asphyxia, low APGAR scores, and congenital abnormalities.[3,4] It can also lead to complications such as fetal distress,

birth asphyxia, and prolonged labor, which often increase the likelihood of cesarean delivery.

The prevalence of oligohydramnios varies with gestational age, affecting 1–5% of pregnancies at term, increasing to 12–14% after 41 weeks, and reaching 30% in post-term pregnancies.[5,6,7] In resource-limited settings, it contributes to approximately 6.5% of stillbirths.[8] Globally, oligohydramnios poses significant challenges to maternal and neonatal health, with poor outcomes often arising from umbilical cord compression, uteroplacental insufficiency, and

meconium aspiration. Timely identification and management are crucial to reducing morbidity and mortality, particularly in vulnerable populations.

A prospective observational study in Dhaka involving 78 singleton pregnancies with low amniotic fluid index (AFI) reported adverse perinatal outcomes associated with oligohydramnios.[9] Key factors included post-term pregnancy (39%), premature rupture of membranes (30%), and prolonged pregnancy (24%). The study found increased risks of fetal distress, low APGAR scores, and cesarean deliveries, underscoring the importance of managing oligohydramnios to reduce maternal and perinatal morbidity.

Oligohydramnios affects approximately 1–5% of term pregnancies worldwide, with prevalence exceeding 12% in post-term pregnancies.[10,11] Its occurrence is influenced by maternal, placental, and fetal factors, such as ruptured membranes, fetal abnormalities, genetic predispositions, maternal illnesses, and nutritional status. The condition elevates maternal risks, often leading to operative interventions or cesarean deliveries due to non-reassuring fetal heart rate patterns.[12,13] Fetal complications include distress, intrauterine growth restriction, pulmonary hypoplasia, and increased NICU admissions.

Despite its association with poor perinatal outcomes, limited data exist on the prevalence and risk factors of oligohydramnios in regions such as East Africa. Inadequate access to ultrasonography services often delays early detection, contributing to adverse outcomes for both mother and baby. This study aims to explore the patterns of risk factors and clinical outcomes associated with oligohydramnios to improve maternal and neonatal care at a tertiary care hospital in Bangladesh, emphasizing the need for effective, locally tailored management strategies.

#### Objectives

- The aim of the study was to evaluate the frequency of risk factors and clinical outcomes in pregnancies with oligohydramnios at a tertiary care hospital in Bangladesh.

#### METHODOLOGY & MATERIALS

This prospective observational study was conducted in the Department of Obstetrics and Gynecology at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from June 1, 2016, to May 31, 2017. A total of 200 pregnant women with oligohydramnios were enrolled in the study.

#### Inclusion Criteria:

- Pregnant women with singleton pregnancies.
- Non-anomalous fetuses.
- Intact membranes.
- Gestational age between 30 and 40 weeks.

#### Exclusion Criteria:

- Patients with premature rupture of membranes (PROM).
- Women with known fetal or chromosomal anomalies.
- Patients with severe pre-eclampsia.
- Women with multiple pregnancies.
- Patients with significant cardiac or other chronic illnesses.

Written informed consent was obtained from all participants, ensuring confidentiality and voluntary participation. Upon admission, detailed interviews were conducted to gather antenatal and postnatal histories, along with clinical examinations and relevant laboratory investigations for each participant. Oligohydramnios was confirmed by measuring the amniotic fluid index (AFI) using ultrasound; patients were positioned supine, and a linear or curvilinear transducer was employed to assess the amniotic fluid by measuring the largest vertical pocket in each of the quadrants of the maternal abdomen, with the sum of these measurements used to calculate the AFI. Data were compiled and analyzed using SPSS version 22.0, employing descriptive statistics, including frequencies and percentages, to summarize the demographic characteristics, associated risk factors, maternal outcomes, and neonatal outcomes of the participants. The primary outcomes measured included perinatal morbidity and mortality, mode of delivery, and neonatal health indicators such as growth retardation and APGAR scores, with statistical significance defined at a p-value of < 0.05.

## RESULT

**Table 1: Demographic and Clinical Characteristics of the Study Participants (n = 200)**

	Variable	Frequency (n)	Percentage (%)
Age Group	20-25	131	65.5
	26-30	47	23.6
	>30	22	10.9
	Mean age (Mean±SD)	23.9±3.3	
Parity	Primigravida	120	60.0
	Multigravida	80	40.0
Gestational Age (weeks)	30-34	25	12.5
	34-37	145	72.5
	37-40	30	15.0
	Mean Gestational Age (Mean±SD)	36.9±2.5	

Table 1 shows the demographic and clinical profile of the study participants. The mean age of the participants was  $23.9 \pm 3.3$  years. Out of 200 participants, 131 (65.5%) were aged 20–25 years, 47 (23.6%) were aged 26–30 years, and 22 (10.9%) were above 30 years. In terms of parity, 71 (35.5%)

participants were primigravida, while 129 (65.5%) were multigravida. The mean gestational age at diagnosis was  $36.9 \pm 2.5$  weeks. Regarding gestational age categories, 25 (12.5%) participants were between 30–34 weeks, 145 (72.5%) were between 34–37 weeks, and 30 (15.0%) were between 37–40 weeks.

**Table 2: Distribution of Associated Risk Factors among Study Participants (n = 200)**

Risk Factor	Frequency (n)	Percentage (%)
Idiopathic	48	24.0
Preeclampsia	28	14.0
Gestational Hypertension	36	18.0
Anemia	32	16.0
PROM	28	14.0
Thyroid Abnormalities	24	12.0
Twin Gestation	4	2.0
Total	200	100.0

Table 2 shows the associated risk factors identified among the participants in our study. Of the 200 participants, the most frequent risk factor was idiopathic oligohydramnios, observed in 48 (24.0%) cases. Hypertensive disorders, including gestational hypertension and preeclampsia, were also prevalent, accounting for 36 (18.0%) and 28 (14.0%) cases,

respectively. Anemia was reported in 32 (16.0%) participants, while premature rupture of membranes (PROM) was identified in 28 (14.0%) cases. Thyroid abnormalities were present in 24 (12.0%) participants, and twin gestation was rare, occurring in only 4 (2.0%) cases.

**Table 3: Maternal Outcomes of the Study Participants (n = 200)**

	Maternal Outcome	Frequency (n)	Percentage (%)
Mode of Delivery	Normal vaginal delivery	116	58.0
	Cesarean section	84	42.0
Reasons for Cesarean Section	Fetal distress	42	21.0
	Oligohydramnios	18	9.0
	FPI, IUGR	16	8.0
	Breech	4	2.0
	Other	4	2.0

Table 3 presents the maternal outcomes among the study participants. Out of 200 pregnancies, 116 (58.0%) resulted in normal vaginal delivery, while 84 (42.0%) required cesarean section. Among the cesarean deliveries, the most common reason was fetal distress, accounting for 42 (21.0%) cases. Oligohydramnios was

the cause in 18 (9.0%) cases, and fetal-pelvic incompatibility (FPI) or intrauterine growth restriction (IUGR) necessitated cesarean delivery in 16 (8.0%) participants. Breech presentation and other factors were less frequent, each contributing to 4 (2.0%) cases.

**Table 4: Neonatal Outcomes of the Study Participants (n = 200)**

Neonatal Outcome		Frequency (n)	Percentage (%)
Growth Retardation	AGA	109	54.5
	SGA	91	45.5
Birth Outcome	Live Birth	189	94.5
	Still Birth	11	5.5
Birth Weight (Kg)	<2.5	142	70.9
	≥2.5	58	29.1
APGAR Score	1 minute <7	131	65.4
	5 minute <7	87	43.6

Table 4 shows the neonatal outcomes observed in the study participants. Among the 200 neonates, 109 (54.5%) were classified as appropriate for gestational age (AGA), while 91 (45.5%) were small for gestational age (SGA). The live birth rate was high, with 189 (94.5%) neonates being born alive and 11 (5.5%) classified as stillbirths. In terms of birth weight, 142 (70.9%) neonates weighed less than 2.5 kg, and 58 (29.1%) had a birth weight of 2.5 kg or greater. Regarding the APGAR scores, 131 (65.4%) of the neonates had scores of less than 7 at 1 minute, and 87 (43.6%) had scores of less than 7 at 5 minutes.

## DISCUSSION

This study highlights the frequency of risk factors and outcomes associated with oligohydramnios among pregnancies at a tertiary care hospital in Bangladesh. Oligohydramnios, a condition marked by reduced amniotic fluid, presents significant challenges to maternal and neonatal health, often requiring timely intervention. The findings underscore the multifactorial nature of the condition, with factors such as hypertensive disorders, anemia, and idiopathic causes playing key roles. The high rates of operative deliveries and neonatal complications highlight the need for early detection and effective management strategies to improve both maternal and neonatal outcomes.

In our study, the demographic profile of the participants indicated that the mean age was  $23.9 \pm 3.3$  years. The largest age group consisted of 131 participants (65.5%) aged 20–25 years, followed by 47 participants (23.6%) in the 26–30 years group and 22 participants (10.9%) above 30 years. This finding aligns with studies by Jagatia *et al.*[14], and Bhat *et al.*[15], which also reported a similar mean age among their participants. Regarding parity, 120 participants (60.0%) were primigravida, while 80 (40.0%) were multigravida. Our proportion of primigravida participants is comparable to the 60% incidence reported by Petrozella *et al.*[16] in a similar cohort. The mean gestational age at diagnosis in our study was  $36.9 \pm 2.5$  weeks, with the majority of participants (72.5%) in the 34–37 week range, followed by 15.0% in the 37–40 week range. These findings are consistent with the study by Casey *et al.*[17], which reported a comparable mean gestational age. The predominance of oligohydramnios in late pregnancy in our study

highlights the importance of close monitoring and timely intervention to reduce maternal and fetal risks.

In our study, the most common risk factor for oligohydramnios was idiopathic, accounting for 48 (24.0%) cases, suggesting that in many pregnancies, no definitive cause can be identified. Similarly, both Bhat *et al.*[15] and Jagatia *et al.*[14] reported that the majority of their patients had idiopathic oligohydramnios, highlighting the frequent occurrence of unexplained cases. Hypertensive disorders, including gestational hypertension (18.0%) and preeclampsia (14.0%), were prevalent in our cohort, as these conditions impair placental blood flow and contribute to reduced amniotic fluid. Anemia, observed in 16.0% of participants, reflects how maternal health directly impacts fetal well-being. PROM, present in 14.0% of cases, leads to fluid leakage, further complicating pregnancy management. Thyroid abnormalities (12.0%) and twin gestations (2.0%) introduce additional risks by altering metabolic or fluid dynamics. These findings emphasize the multifactorial nature of oligohydramnios and underline the importance of early detection and intervention for better pregnancy outcomes.

Our study found that 58.0% of participants had normal vaginal deliveries, while 42.0% underwent cesarean sections. This is consistent with the findings of Jagatia *et al.*[14], who reported 56.0% vaginal deliveries among patients with oligohydramnios. Similarly, the study from Umber *et al.*[18] observed 68.0% vaginal deliveries and 32.0% cesarean sections, highlighting the trend toward vaginal delivery when conditions permit. However, cesarean sections in our study were often performed due to fetal distress (21.0%), oligohydramnios itself (9.0%), and other complications like intrauterine growth restriction (IUGR). These results emphasize the need for careful fetal monitoring and individualized delivery planning.

In our study, 70.9% of the babies had low birth weight (<2.5 kg), which aligns with the findings of Patel *et al.*[19], while Biradar *et al.*[20] reported a lower incidence of 38.6%, highlighting variability in outcomes. Additionally, 45.5% of neonates were small for gestational age (SGA), similar to the 40% reported by Philipson *et al.*[21], further emphasizing the link between oligohydramnios and intrauterine growth

restriction (IUGR). APGAR scores <7 at 1 minute were seen in 65.4% of cases, with 43.6% scoring <7 at 5 minutes, indicating the need for close neonatal monitoring. These findings are consistent with Patel *et al.*[19] and Vidyasagar *et al.*[22], who reported APGAR <7 at 1 minute in 34.6% and 35.0% of neonates, respectively.

Overall, the findings of this study highlight the critical role of regular antenatal care in the early identification of risk factors contributing to oligohydramnios. Strengthening maternal healthcare services and adopting individualized pregnancy management strategies are essential to improving maternal and neonatal outcomes, while minimizing the need for emergency interventions.

#### Limitations of the study

This study had some limitations:

- The study was conducted in a selected tertiary-level hospital.
- The sample was not randomly selected.
- The study's limited geographic scope may introduce sample bias, potentially affecting the broader applicability of the findings.

Therefore, the findings of this study cannot be generalized to the entire population.

#### CONCLUSION

Oligohydramnios is a common complication in pregnancies, necessitating enhanced monitoring and comprehensive prenatal and postnatal care. The study revealed a significant prevalence of low birth weight and abnormal fetal growth among neonates, emphasizing the association between oligohydramnios and increased risks of intrauterine growth restriction (IUGR). The high rate of cesarean deliveries, particularly due to fetal distress, highlights the importance of vigilant labor management. Overall, identifying risk factors early and implementing timely interventions by healthcare providers can lead to improved maternal and neonatal outcomes in pregnancies affected by oligohydramnios.

#### REFERENCES

1. Vintzileos A. Antepartum fetal surveillance. Clin Obstet Gynecol [Internet]. 1995;38(1):1-2.
2. Bansal D, Deodhar P. A clinical study of maternal and perinatal outcome in oligohydramnios. J Res Med Den Sci. 2015 Oct 1;3(4):312-6.
3. Dasari P, Niveditta G, Raghavan S. The maximal vertical pocket and amniotic fluid index in predicting fetal distress in prolonged pregnancy. International Journal of Gynecology & Obstetrics. 2007 Feb 1;96(2):89-93.
4. Sultana S, Akbar Khan MN, Khanum Akhtar KA, Aslam M. Low amniotic fluid index in high-risk pregnancy and poor apgar score at birth. J Coll Physicians Surg Pak. 2008 Oct 1;18(10):630-4.
5. Kaur P, Desai DA, Taraiya A. A study on the perinatal outcome in cases of oligohydramnios. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2016 Jan 1;5(1):98-110.
6. Chidanandaiah SK, Chandrashekhar K, Gaddi S, Tharihalli CT. Pregnancy outcome after diagnosis of oligohydramnios at term. Int J Reprod Contracept Obstet Gynecol. 2013 Mar;2(1):23-6.
7. Elsandabese D, Majumdar S, Sinha S. Obstetricians' attitudes towards 'isolated' oligohydramnios at term. Journal of Obstetrics and Gynaecology. 2007 Jan 1;27(6):574-6.
8. Aminu M, Unkels R, Mdegela M, Utz B, Adaji S, Van Den Broek N. Causes of and factors associated with stillbirth in low-and middle-income countries: a systematic literature review. BJOG: An International Journal of Obstetrics & Gynaecology. 2014 Sep;121:141-53.
9. Nazlima N, Fatima B. Oligohydramnios at third trimester and perinatal outcome. Bangladesh Journal of medical science. 2012;11(1):33.
10. Boyd RL, Carter SC. Polyhydramnios and oligohydramnios. eMed J. 2001;2:1854.
11. Locatelli A, Zagarella A, Toso L, Assi F, Ghidini A, Biffi A. Serial assessment of amniotic fluid index in uncomplicated term pregnancies: prognostic value of amniotic fluid reduction. The Journal of Maternal-Fetal & Neonatal Medicine. 2004 Apr 1;15(4):233-6.
12. Giri A, Hospital, MATERIALS AND METHODS. Orig Artic Nepal Med Coll J. 2015;17(12):63-6.
13. Hamed A, Mohamed G. Pregnancy outcome among patients with oligohydramnios and suggested plan of action. IOSR J Nurs Heal Sci Ver. 2015;3:4.
14. Jagatia K, Singh N, Patel S. Maternal and fetal outcome in oligohydramnios: A study of 100 cases. Int J Med Sci Public Health. 2013 Jul 1;2(3):724.
15. Bhat S, Kulkarni V. Study of effect of oligohydramnios on maternal and fetal outcome. Int J Med Dent Sci. 2015;4(1):582.
16. Petrozella LN, Dashe JS, McIntire DD, Leveno KJ. Clinical significance of borderline amniotic fluid index and oligohydramnios in preterm pregnancy. Obstetrics & Gynecology. 2011 Feb 1;117(2 Part 1):338-42.
17. Casey BM, McIntire DD, Bloom SL, Lucas MJ, Santos R, Twickler DM, Ramus RM, Leveno KJ. Pregnancy outcomes after antepartum diagnosis of oligohydramnios at or beyond 34 weeks' gestation. American journal of obstetrics and gynecology. 2000 Apr 1;182(4):909-12.
18. Umer A. Perinatal outcome in pregnancies complicated by isolated oligohydramnios at. Annals of King Edward Medical University. 2009;15(1):35.
19. Patel PK, Pitre DS, Gupta H. Pregnancy outcome in isolated oligohydramnios at term. National

- Journal of Community Medicine. 2015 Jun 30;6(02):217-21.
20. Biradar K, Shamanewadi A. Maternal and perinatal outcome in oligohydramnios: study from a tertiary care hospital, Bangalore, Karnataka, India. *Int J Reprod Contracept Obstet Gynecol.* 2016 Jul;5(7):2291-9.
21. Philipson EH, Sokol RJ, Williams T. Oligohydramnios: clinical associations and predictive value for intrauterine growth retardation. *American journal of obstetrics and gynecology.* 1983 Jun 1;146(3):271-8.
22. Vidyasagar V, Chutani N. Fetomaternal outcome in cases of oligohydramnios after 28 weeks of pregnancy. *Int J Reprod Contracept Obstet Gynecol.* 2015 Feb 1;4(1):152-6.