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Original Article

Sonographic Evaluation of Amniotic Fluid Index Among Diabetic and Non-Diabetic Patients

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ABSTRACT

Background: Amniotic fluid index is an important sonographic marker for assessing fetal well-being and detecting abnormalities in amniotic fluid volume during pregnancy. Diabetes mellitus during pregnancy may alter amniotic fluid dynamics through maternal fetal metabolic changes and is commonly associated with increased risk of polyhydramnios **Objective:** To compare sonographic amniotic fluid index findings among diabetic and non-diabetic pregnant women and assess the distribution of oligohydramnios and polyhydramnios across maternal age groups. **Methods:** A comparative cross-sectional observational study was conducted among 80 pregnant women in the second and third trimesters at the Department of Radiology, Ch. M. Akram Teaching and Research Hospital, Lahore. Participants were categorized as diabetic or non-diabetic. Amniotic fluid index was assessed using the four-quadrant ultrasound technique. Oligohydramnios was defined as amniotic fluid index ≤5 cm, and polyhydramnios was defined as amniotic fluid index ≥24 cm. Data were analyzed using SPSS version 26.0, and chi-square testing was applied for categorical associations. **Results:** Of 80 participants, 57 (71.3%) were diabetic and 23 (28.8%) were non-diabetic. Most women were examined in the third trimester, 53 (66.3%). Polyhydramnios was present in 44 participants (55.0%), while oligohydramnios was present in 36 participants (45.0%). Maternal age group was not significantly associated with diabetic status (p=0.257), gestational trimester (p=0.906), oligohydramnios (p=0.884), or polyhydramnios (p=0.180). **Conclusion:** Sonographic assessment showed a high burden of amniotic fluid abnormalities, with polyhydramnios slightly more frequent than oligohydramnios. Routine AFI monitoring remains clinically valuable, particularly in pregnancies complicated by diabetes. **Keywords:** Amniotic Fluid Index, Diabetes Mellitus, Pregnancy, Ultrasonography, Polyhydramnios, Oligohydramnios.

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INTRODUCTION

Amniotic fluid is an essential component of the intrauterine environment and plays a critical role in fetal growth, movement, lung maturation, temperature regulation, and protection from external trauma and umbilical cord compression. Its volume changes throughout pregnancy as fetal urine production, fetal swallowing, lung secretions, and transmembranous exchange progressively regulate amniotic fluid dynamics. Because abnormal amniotic fluid volume is associated with adverse maternal and fetal outcomes, sonographic assessment of amniotic fluid has become an important part of routine antenatal surveillance. The amniotic fluid index is a widely used, non-invasive ultrasound-based method for estimating amniotic fluid volume by summing the deepest vertical fluid pockets in four uterine quadrants. Clinically, oligohydramnios is commonly defined as an amniotic fluid index of 5 cm or less, while polyhydramnios is commonly defined as an amniotic fluid index of 24 cm or greater (1,2).

Diabetes mellitus during pregnancy, including pregestational and gestational diabetes, can disturb maternal–fetal metabolic balance and influence amniotic fluid regulation. Maternal hyperglycemia may contribute to fetal hyperglycemia, osmotic diuresis, increased fetal urine output, and subsequent elevation of amniotic fluid volume. For this reason, diabetic pregnancies are frequently considered high-risk and require closer sonographic monitoring. Previous studies have reported higher mean amniotic fluid index values among diabetic pregnant women compared with non-diabetic pregnant women, with a greater frequency of polyhydramnios in the diabetic group. Masood et al. reported a significantly higher mean amniotic fluid index in diabetic pregnancies than in non-diabetic pregnancies, while Dastgir et al. observed increased amniotic fluid index values among diabetic women during both the second and third trimesters (3-5).

Although polyhydramnios is often associated with diabetes, fetal anomalies, infection, and impaired fetal swallowing, oligohydramnios is also clinically important because it may indicate placental insufficiency, fetal growth restriction, ruptured membranes, or other maternal-fetal complications. Both low and high amniotic fluid volumes have been linked with increased rates of cesarean delivery, fetal distress, neonatal intensive care admission, preterm birth, and adverse perinatal outcomes. Bakhsh et al. reported that amniotic fluid disorders were associated with maternal diabetes and adverse prenatal outcomes, while other studies have emphasized that abnormal amniotic fluid index values can help identify pregnancies requiring closer monitoring and timely obstetric intervention (6,7).

Despite the established clinical relevance of amniotic fluid assessment, local evidence comparing sonographic amniotic fluid index findings between diabetic and non-diabetic pregnant women remains limited. Many previous studies have focused either on general pregnancy outcomes associated with abnormal amniotic fluid volume or on isolated cases of polyhydramnios and oligohydramnios. Fewer studies have directly compared diabetic and non-diabetic pregnant women using sonographic amniotic fluid index assessment across the second and third trimesters, particularly in local hospital-based populations (8). This creates a practical knowledge gap for clinicians and sonographers involved in antenatal screening, because early recognition of amniotic fluid abnormalities in diabetic pregnancies may improve fetal surveillance, guide referral, and support timely management decisions.

Therefore, this study was designed to sonographically evaluate and compare the amniotic fluid index among diabetic and non-diabetic pregnant women. Using a PICO-based framework, the population of interest was pregnant women in the second and third trimesters undergoing obstetric ultrasound; the exposure group was pregnant women with diabetes; the comparison group was pregnant women without diabetes; and the outcomes were amniotic fluid index patterns, including oligohydramnios and polyhydramnios. The objective of the study was to compare sonographic amniotic fluid index findings among diabetic and non-diabetic pregnant women and to assess the distribution of amniotic fluid abnormalities in the study population.

MATERIALS AND METHODS

A comparative cross-sectional observational study was conducted to evaluate sonographic amniotic fluid index patterns among diabetic and non-diabetic pregnant women. The study design was selected because the primary objective was to assess and compare amniotic fluid status at a single point of antenatal ultrasound examination rather than to determine incidence over time or evaluate treatment response. The study was carried out in the Department of Radiology, Ch. M. Akram Teaching and Research Hospital, Lahore, over a period of 4–6 months. Pregnant women attending antenatal ultrasound services during the study period were screened for eligibility and categorized into diabetic and non-diabetic groups according to documented clinical diabetic status.

The study population consisted of pregnant women with singleton gestation in the second or third trimester who provided informed consent for participation and underwent obstetric ultrasound assessment for amniotic fluid evaluation. Eligible participants included women with available

demographic, obstetric, clinical, and sonographic information required for analysis. Women with multiple gestation, known fetal anomalies affecting amniotic fluid regulation, ruptured membranes, active labor at the time of scanning, or refusal to participate were excluded. Participants were selected using non-probability consecutive sampling until the required sample size was achieved, ensuring that all eligible women presenting during the study period had an opportunity to be included (9,10).

A total sample size of 80 pregnant women was included. The sample size was calculated using a 95% confidence level, 5% margin of error, and an expected prevalence of 8.34% for the target amniotic fluid abnormality (11). Participants were divided into diabetic and non-diabetic categories for comparative analysis. Written informed consent was obtained before data collection, and participants were informed about the purpose of the study, voluntary nature of participation, confidentiality of collected information, and their right to withdraw at any stage without any effect on their clinical care.

Data were collected using a structured data collection form that included maternal age, diabetic status, gestational trimester, and ultrasound findings related to amniotic fluid volume. Maternal age was recorded in completed years and categorized into 18–27 years, 28–36 years, and 37–45 years.

Gestational age was categorized as second trimester or third trimester according to the gestational period at the time of ultrasound examination. Diabetic status was recorded as diabetic or non-diabetic based on available clinical history or medical record documentation. The primary outcome variable was amniotic fluid status assessed sonographically by amniotic fluid index. Secondary outcome variables included the presence of oligohydramnios and polyhydramnios.

Ultrasound examination was performed using an APLIO 500 ultrasound system with a curvilinear abdominal transducer operating within a 2–5 MHz frequency range. Participants were positioned supine with slight lateral tilt where required to reduce the risk of supine hypotension. Amniotic fluid index was measured using the standard four-quadrant technique.

The maternal abdomen was divided into four uterine quadrants, and the deepest vertical pocket of amniotic fluid free from fetal parts, umbilical cord, and placenta was measured in centimeters in each quadrant. The four measurements were summed to calculate the amniotic fluid index. Oligohydramnios was operationally defined as an amniotic fluid index of 5 cm or less, while polyhydramnios was operationally defined as an amniotic fluid index of 24 cm or greater. Each participant's ultrasound findings were recorded immediately after examination to minimize transcription error.

To reduce measurement bias, all sonographic measurements were performed using a uniform scanning protocol and the same operational definitions for amniotic fluid categories. Participants were assessed using the same ultrasound equipment and standardized patient positioning. Data collection forms were reviewed for completeness before entry into the database.

Potential confounding variables considered during analysis included maternal age and gestational trimester, as both may influence amniotic fluid volume and pregnancy risk profile. Stratified descriptive analysis was used to examine the distribution of outcomes across age groups and gestational trimester, while inferential analysis was planned to compare categorical variables between diabetic and non-diabetic participants.

Data were entered, coded, cleaned, and analyzed using Statistical Package for the Social Sciences version 26.0. Categorical variables, including age group, diabetic status, gestational trimester, oligohydramnios, and polyhydramnios, were summarized as frequencies and percentages. Cross-tabulation was used to examine associations between categorical variables.

The chi-square test was applied for group comparisons where test assumptions were satisfied, and Fisher's exact test was considered for sparse cell counts. A two-tailed p-value of ≤ 0.05 was considered statistically significant. For clinically relevant comparisons, proportions were planned to be reported

with inferential statistics, including p-values and effect estimates where applicable. Missing or incomplete entries were reviewed during data cleaning, and only complete valid cases were included in the final analysis.

Ethical principles for human participant research were followed throughout the study. Written informed consent was obtained from all participants before enrollment. Confidentiality was maintained by recording participant information without personally identifiable details in the analytical dataset.

Data were used only for research purposes and stored securely with access limited to the research team. Ultrasound assessment was non-invasive and part of routine antenatal imaging; therefore, no additional physical risk was introduced by participation. Data integrity was supported through standardized data collection, consistent variable coding, review of completed forms before analysis, and use of predefined operational definitions for all major study variables.

RESULTS

A total of 80 pregnant women were included in the analysis. The largest age group was 18–27 years, comprising 38 participants (47.5%), followed by 28–36 years with 23 participants (28.8%) and 37–45 years with 19 participants (23.8%). Regarding clinical category, 57 women (71.3%) were diabetic and 23 women (28.8%) were non-diabetic.

Most participants were examined during the third trimester, accounting for 53 cases (66.3%), while 27 cases (33.8%) were in the second trimester. Sonographic assessment showed that 36 participants (45.0%) had oligohydramnios, whereas 44 participants (55.0%) did not. Polyhydramnios was identified in 44 participants (55.0%), while 36 participants (45.0%) had no polyhydramnios.

Maternal age distribution was also compared with gestational trimester at the time of ultrasound examination. Among the 53 women in the third trimester, 25 participants (47.2%) were aged 18–27 years, 16 participants (30.2%) were aged 28–36 years, and 12 participants (22.6%) were aged 37–45 years. Among the 27 women in the second trimester, 13 participants (48.1%) were aged 18–27 years, 7 participants (25.9%) were aged 28–36 years, and 7 participants (25.9%) were aged 37–45 years. The association between maternal age group and gestational trimester was not statistically significant, $\chi^2=0.198$, df=2, p=0.906, with a negligible effect size (Cramer's V=0.050).

Table 1. Baseline Demographic and Clinical Characteristics of Study Participants

Variable	Category	Frequency (n=80)	Percentage (%)
Maternal age	18–27 years	38	47.5
	28–36 years	23	28.8
	37–45 years	19	23.8
Patient category	Diabetic	57	71.3
	Non-diabetic	23	28.8
Gestational trimester	Third trimester	53	66.3
	Second trimester	27	33.8
Oligohydramnios	Yes	36	45.0
	No	44	55.0
Polyhydramnios	Yes	44	55.0
	No	36	45.0

Analysis of maternal age distribution according to diabetic status showed that among the 57 diabetic participants, 24 women (42.1%) were aged 18–27 years, 19 women (33.3%) were aged 28–36 years, and 14 women (24.6%) were aged 37–45 years. Among the 23 non-diabetic participants, 14 women (60.9%) were aged 18–27 years, 4 women (17.4%) were aged 28–36 years, and 5 women (21.7%) were aged 37–45 years. Pearson chi-square analysis showed no statistically significant association between maternal age group and diabetic status, $\chi^2=2.718$, df=2, p=0.257, with a small effect size (Cramer's V=0.184).

Table 2. Association Between Maternal Age Group and Diabetic Status

Maternal Age Group	Diabetic n (%)	Non-Diabetic n (%)	Total n (%)	χ^2	df	p-value	Cramer's V
18–27 years	24 (42.1)	14 (60.9)	38 (47.5)	2.718	2	0.257	0.184
28–36 years	19 (33.3)	4 (17.4)	23 (28.8)				
37–45 years	14 (24.6)	5 (21.7)	19 (23.8)				
Total	57 (100.0)	23 (100.0)	80 (100.0)				

Table 3. Association Between Maternal Age Group and Gestational Trimester

Maternal Age Group	Third Trimester n (%)	Second Trimester n (%)	Total n (%)	χ^2	df	p-value	Cramer's V
18–27 years	25 (47.2)	13 (48.1)	38 (47.5)	0.198	2	0.906	0.050
28–36 years	16 (30.2)	7 (25.9)	23 (28.8)				
37–45 years	12 (22.6)	7 (25.9)	19 (23.8)				
Total	53 (100.0)	27 (100.0)	80 (100.0)				

The relationship between maternal age and oligohydramnios was examined using cross-tabulation. Among participants without oligohydramnios, 22 of 44 women (50.0%) were aged 18–27 years, 12 women (27.3%) were aged 28–36 years, and 10 women (22.7%) were aged 37–45 years.

Among participants with oligohydramnios, 16 of 36 women (44.4%) were aged 18–27 years, 11 women (30.6%) were aged 28–36 years, and 9 women (25.0%) were aged 37–45 years. Pearson chi-square testing demonstrated no statistically significant association between maternal age group and oligohydramnios, $\chi^2=0.246$, df=2, p=0.884, with a negligible effect size (Cramer's V=0.055).

Table 4. Association Between Maternal Age Group and Oligohydramnios

Maternal Age Group	No Oligohydramnios n (%)	Oligohydramnios n (%)	Total n (%)	χ^2	df	p-value	Cramer's V
18–27 years	22 (50.0)	16 (44.4)	38 (47.5)	0.246	2	0.884	0.055
28–36 years	12 (27.3)	11 (30.6)	23 (28.8)				
37–45 years	10 (22.7)	9 (25.0)	19 (23.8)				
Total	44 (100.0)	36 (100.0)	80 (100.0)				

The association between maternal age group and polyhydramnios showed that among the 36 women without polyhydramnios, 14 participants (38.9%) were aged 18–27 years, 14 participants (38.9%) were aged 28–36 years, and 8 participants (22.2%) were aged 37–45 years.

Among the 44 women with polyhydramnios, 24 participants (54.5%) were aged 18–27 years, 9 participants (20.5%) were aged 28–36 years, and 11 participants (25.0%) were aged 37–45 years. Pearson

chi-square analysis showed no statistically significant association between maternal age group and polyhydramnios, χ^2=3.426, df=2, p=0.180, although the effect size was small to modest (Cramer's V=0.207).

Table 5. Association Between Maternal Age Group and Polyhydramnios

Maternal Age Group	No Polyhydramnios n (%)	Polyhydramnios n (%)	Total n (%)	χ^2	df	p-value	Cramer's V
18–27 years	14 (38.9)	24 (54.5)	38 (47.5)	3.426	2	0.180	0.207
28–36 years	14 (38.9)	9 (20.5)	23 (28.8)				
37–45 years	8 (22.2)	11 (25.0)	19 (23.8)				
Total	36 (100.0)	44 (100.0)	80 (100.0)				

Overall, the results showed that diabetic participants formed the majority of the sample, representing 71.3% of all cases. Third-trimester examinations were more frequent than second-trimester examinations, accounting for approximately two-thirds of the sample. Polyhydramnios was observed in 55.0% of participants and oligohydramnios in 45.0%. Across the available age-based analyses, maternal age group was not significantly associated with diabetic status, gestational trimester, oligohydramnios, or polyhydramnios, as all Pearson chi-square p-values were greater than 0.05.

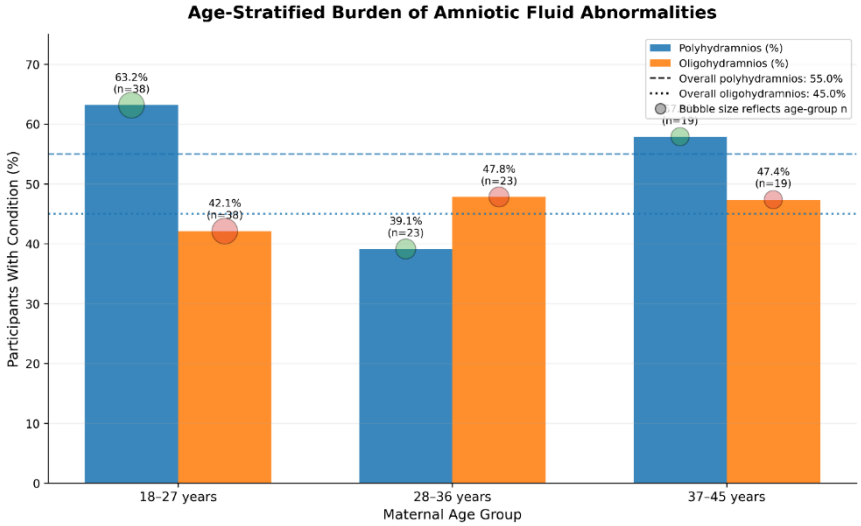

Figure 1. Age-Stratified Burden of Amniotic Fluid Abnormalities

Polyhydramnios showed a non-linear age-stratified pattern, with the highest proportion in the 18–27-year group at 63.2% (24/38), a decline in the 28–36-year group to 39.1% (9/23), and a rise again in the 37–45-year group to 57.9% (11/19). In contrast, oligohydramnios remained comparatively stable across age groups, increasing slightly from 42.1% (16/38) in women aged 18–27 years to 47.8% (11/23) in those aged 28–36 years and 47.4% (9/19) in those aged 37–45 years. The overall burden was higher for polyhydramnios (55.0%) than oligohydramnios (45.0%), and the age-specific deviation was most evident for polyhydramnios, particularly in the youngest and oldest maternal age groups.

DISCUSSION

This comparative cross-sectional study evaluated sonographic amniotic fluid abnormalities among diabetic and non-diabetic pregnant women in the second and third trimesters, with additional assessment of maternal age distribution across clinical and sonographic categories. The study included 80 pregnant women, of whom 57 (71.3%) were diabetic and 23 (28.8%) were non-diabetic. Most participants were examined in the third trimester, representing 53 cases (66.3%), while 27 cases (33.8%) were examined in

the second trimester. Sonographic assessment demonstrated a high overall burden of abnormal amniotic fluid volume, with polyhydramnios identified in 44 women (55.0%) and oligohydramnios in 36 women (45.0%). These findings highlight the clinical importance of routine AFI assessment in antenatal ultrasound, particularly among pregnancies with metabolic risk factors, because both increased and reduced amniotic fluid volumes may reflect altered fetal–maternal physiology and can influence obstetric decision-making.

In the present study, diabetic women formed the majority of the sample, which supports the clinical relevance of examining amniotic fluid patterns in pregnancies complicated by diabetes. Maternal diabetes is biologically linked with altered amniotic fluid regulation because maternal hyperglycemia can lead to fetal hyperglycemia, osmotic diuresis, and increased fetal urine production, thereby increasing the risk of polyhydramnios. This mechanism is consistent with previous literature reporting higher mean AFI values and higher polyhydramnios frequency among diabetic pregnant women compared with non-diabetic controls. A recent study reported a markedly higher mean AFI in diabetic pregnancies than in non-diabetic pregnancies, while another study also observed significantly higher AFI values among diabetic women during both the second and third trimesters (12,13). Similarly, a study found a strong relationship between polyhydramnios and gestational diabetes, with most women presenting with polyhydramnios later diagnosed with gestational diabetes after 28 weeks of gestation (14). These studies support the interpretation that diabetes-related metabolic disturbance may contribute to excess amniotic fluid accumulation, although the present analysis was limited to available categorical summaries rather than continuous AFI values.

Polyhydramnios was more frequent than oligohydramnios in this study, affecting 55.0% of participants compared with 45.0% for oligohydramnios. This pattern is clinically meaningful because polyhydramnios has been associated with gestational diabetes, fetal macrosomia, malpresentation, preterm labor, premature rupture of membranes, cord prolapse, cesarean delivery, and postpartum hemorrhage. Previous work has shown that polyhydramnios is often idiopathic, but diabetes remains one of the most frequently recognized maternal contributors. Moore reported that diabetes accounted for a smaller proportion of polyhydramnios than traditionally assumed, but diabetic cases still commonly clustered within clinically relevant AFI ranges (15). A similar study also demonstrated that polyhydramnios in diabetic mothers was associated with adverse perinatal outcomes and poorer diabetic control, particularly where HbA1c levels were elevated (16). The high proportion of polyhydramnios observed in the current study therefore reinforces the importance of sonographic fluid surveillance in diabetic pregnancies, while also indicating that additional clinical variables such as glycemic control, fetal growth parameters, and congenital anomaly screening would strengthen interpretation.

Oligohydramnios was present in 36 participants, representing 45.0% of the total sample. Although diabetes is more commonly discussed in relation to polyhydramnios, reduced amniotic fluid volume remains clinically important because it may be associated with uteroplacental insufficiency, fetal growth restriction, hypertensive disorders, ruptured membranes, post-term pregnancy, and fetal compromise. In previous studies, oligohydramnios has been linked with higher rates of fetal distress, cesarean delivery, low birth weight, low Apgar score, and neonatal intensive care admission. Vidyasagara et al. reported significantly higher cesarean delivery and NICU admission rates among both oligohydramnios and polyhydramnios groups compared with women with normal AFI, while Milani et al. reported increased adverse neonatal outcomes among pregnancies with low or borderline AFI (17-19). In the present study, oligohydramnios was not significantly associated with maternal age group, suggesting that reduced fluid volume may be influenced more strongly by other maternal, placental, fetal, or gestational factors than age alone.

The age-based analyses showed no statistically significant association between maternal age group and diabetic status, gestational trimester, oligohydramnios, or polyhydramnios. For maternal age and diabetic status, the association was not significant, with $\chi^2=2.718$, df=2, and p=0.257. Similarly, maternal

age was not significantly associated with gestational trimester, with χ^2=0.198, df=2, and p=0.906. These findings suggest that the distribution of diabetic status and trimester of examination was relatively comparable across the three age categories. The lack of age-related difference in trimester distribution is important because amniotic fluid volume changes across gestation; therefore, a major imbalance in trimester distribution could have confounded the observed age-based fluid patterns.

Maternal age was also not significantly associated with oligohydramnios, with χ^2=0.246, df=2, p=0.884, and a negligible effect size. Oligohydramnios proportions were relatively similar across age groups, occurring in 42.1% of women aged 18–27 years, 47.8% of women aged 28–36 years, and 47.4% of women aged 37–45 years. This stable distribution indicates that, within this sample, maternal age did not meaningfully alter the proportion of women presenting with reduced amniotic fluid volume. In contrast, polyhydramnios showed a more variable age-stratified pattern, occurring in 63.2% of women aged 18–27 years, 39.1% of women aged 28–36 years, and 57.9% of women aged 37–45 years; however, this association was not statistically significant, with χ^2=3.426, df=2, p=0.180. The observed pattern may suggest a non-linear distribution of polyhydramnios across maternal age groups, but the sample size was not sufficient to establish this as a statistically reliable age-related trend.

The predominance of third-trimester assessments in the sample is clinically relevant because amniotic fluid disorders are often more apparent and more frequently acted upon in later pregnancy. AFI normally varies with gestational age, and late pregnancy assessment is commonly used to guide fetal surveillance and delivery planning. Bhinder et al. reported a decreasing trend in AFI as pregnancy advances from term to postdate pregnancy in a Pakistani population, emphasizing the importance of gestational age when interpreting AFI values (20). Likewise, Kofinas and Kofinas found that AFI patterns differed between diabetic and non-diabetic pregnancies across late gestation, with diabetic pregnancies showing relatively stable AFI values while normal pregnancies showed a decline with advancing gestational age (21,22). These findings indicate that future interpretation of AFI in diabetic pregnancies should ideally include trimester-specific or gestational-week-specific analysis rather than broad second- and third-trimester categories alone.

The findings also emphasize the importance of distinguishing statistical significance from clinical relevance. Although age-based associations were not statistically significant, the absolute burden of amniotic fluid abnormality remained high. A non-significant p-value does not exclude clinical importance, particularly in a small single-center sample where statistical power may be limited. The high frequency of polyhydramnios and oligohydramnios indicates that careful sonographic monitoring remains clinically valuable. However, interpretation should prioritize effect size, confidence intervals, and direct comparison between diabetic and non-diabetic groups in addition to p-values. This is especially important because AFI abnormalities may be influenced by multiple interrelated factors, including diabetes status, glycemic control, gestational age, fetal growth, parity, maternal body mass index, hypertensive disorders, placental function, and fetal structural anomalies.

This study has several limitations. The sample size was limited to 80 participants, which reduces statistical power for subgroup analysis and may limit detection of modest associations. The single-center design may affect generalizability to other populations or clinical settings. Diabetes was analyzed categorically, but information regarding type of diabetes, duration of disease, treatment status, glycemic control, and HbA1c level was not included in the available analysis. Continuous AFI values were not reported, which restricted interpretation to categorical outcomes rather than allowing comparison of mean or median AFI between diabetic and non-diabetic groups. Maternal BMI, parity, fetal biometric parameters, fetal anomalies, hypertensive disorders, and neonatal outcomes were not incorporated into the final statistical analysis, although these variables may influence amniotic fluid volume and pregnancy outcomes. In addition, multivariable analysis was not performed, so potential confounding could not be adjusted statistically.

Despite these limitations, the study contributes clinically useful local data on sonographic amniotic fluid abnormalities among pregnant women with a high proportion of diabetes. The findings support the value of AFI assessment as a simple, non-invasive component of antenatal ultrasound evaluation. The high observed burden of polyhydramnios and oligohydramnios underscores the need for structured assessment of amniotic fluid volume in high-risk pregnancies. Integration of AFI measurement with diabetic status, gestational age, fetal growth assessment, and maternal clinical profile can improve risk stratification and help guide timely obstetric referral, closer fetal surveillance, and individualized management.

CONCLUSION

This comparative cross-sectional study demonstrated a high sonographic burden of amniotic fluid abnormalities among pregnant women evaluated in the second and third trimesters, with polyhydramnios observed in 44 participants (55.0%) and oligohydramnios in 36 participants (45.0%). Diabetic women represented the majority of the sample, accounting for 57 cases (71.3%), supporting the clinical importance of routine amniotic fluid index assessment in pregnancies complicated by diabetes. Maternal age group was not significantly associated with diabetic status, gestational trimester, oligohydramnios, or polyhydramnios, indicating that age alone did not explain the distribution of amniotic fluid abnormalities in this cohort. Overall, the findings emphasize the value of sonographic AFI monitoring as a non-invasive tool for identifying abnormal amniotic fluid volume in antenatal care, particularly among high-risk pregnancies, and highlight the need to interpret AFI findings alongside diabetic status, gestational age, and broader maternal-fetal clinical factors.

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