Comparison of Third Trimester Fetal Abdominal Circumference in Filipino Pregnant Women with and Without Gestational Diabetes Mellitus in a Tertiary Hospital: A Retrospective Cohort Study

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Abstract

Background. Gestational diabetes mellitus (GDM) may increase fetal abdominal fat mass, but its correlation with fetal abdominal circumference (AC) is inconsistent. This study compares third trimester fetal AC between adult pregnant patients with and without GDM, and between those managed with diet modification alone versus insulin therapy.

Methods. This retrospective cohort study involved 354 Filipino adult pregnant patients at The Medical City admitted for delivery from January 2016 to May 2022. This included 180 patients with GDM, and 174 patients without GDM. One hundred sixteen (116) of the GDM patients were diet-managed, and 64 were insulin-requiring. Participants underwent third trimester fetal AC ultrasound and 75-gram oral glucose tolerance test (OGTT) between 24 to 28 weeks of gestation. The third trimester fetal AC, fetal outcomes and maternal outcomes between patient groups were analyzed using Stata 15.0.

Results. The GDM group had higher rates of cesarean section delivery (70% vs 46.55%, p<.001), maternal complications (35.56% vs 2.3%, p<.001); and neonates with lower age of gestation at birth (38 vs 39 weeks, p<.001), longer birth length (49 vs 48cm, p=.001), and higher number of NICU admissions (13.33 vs 4.02%, p=.002). The study exhibited correlation between GDM status and third trimester fetal AC (coefficient (β) 0.60, 95% confidence interval 0.18, 1.03). Adjusting for gestational age at ultrasound, fetal AC in the GDM group was 0.60 cm larger than in the non-GDM group (p = .006). At 37 weeks, median fetal AC was 33.2 cm in the GDM group (versus 32.4, p=0.001). There was no significant association between GDM management type and fetal AC.

Conclusion. Third trimester fetal AC is significantly larger in women with GDM compared to non-GDM women, regardless of management method. Monitoring fetal AC during the third trimester is important for prenatal care in GDM pregnancies.

Keywords: *Gestational diabetes mellitus, fetal abdominal circumference, third trimester ultrasound*

Introduction

Gestational diabetes mellitus (GDM) is a serious pregnancy condition. It is defined as any degree of glucose intolerance with onset or first recognition during pregnancy. The management consists of insulin therapy or diet modification and the condition may progress to type 2 diabetes mellitus after pregnancy.[1] GDM is estimated to affect 7-10% of pregnancies worldwide.[2] In the Philippines, based on data published from the Asian Federation of Endocrine Societies Study Group on Diabetes in Pregnancy (ASGODIP), GDM has a prevalence of 14% in 1203 pregnancies studied, 40.4% of high-risk pregnancy were positive for GDM when screened beyond the 26th week of pregnancy.[3]

GDM has been associated with fetal and maternal morbidities, including preeclampsia, birth trauma, increased cesarean rate, macrosomia, and higher future risk for diabetes mellitus. [4] The recommended routine screening for GDM is the 75-gram oral glucose tolerance

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test (OGTT) at 24 to 28 weeks age of gestation (AOG). In terms of diagnostic criteria for GDM, widely used is that formulated by the International Association of Diabetes in Pregnancy Study Group (IADPSG) which considered evidence from Hyperglycemia Adverse Pregnancy Outcome (HAPO) trial, i.e., the presence of any of the following constituted a positive diagnosis of GDM: (1) fasting ≥ 92 mg/dl (2) 1-hour post glucose intake ≥180 mg/dl (3) 2-hour post glucose intake ≥ 153 mg/dl.[5]

Third trimester fetal ultrasound taken between 28 to 42 weeks AOG is believed to be a useful tool in predicting diverse relevant neonatal outcomes.[6] It facilitates the identification of congenital malformation and deviant fetal growth and provides fetal weight estimation for safer pregnancy and timely delivery. It also provides fetal biophysical parameters including abdominal circumference (AC), femoral length (FL), biparietal diameter (BPD) and estimated fetal weight (EFW).[7]

Several studies showed that fetuses of women with GDM have excessive adiposity accumulation in their body beginning at 20 weeks AOG compared to fetuses of women with normal glucose tolerance. [4,8] GDM is suggested to increase fetal fat mass as well due to the exposure of the fetus to altered metabolic intrauterine environment. [8] Excess fat in the fetus is deposited mostly in the abdominal and scapular girdle. Fetal anterior abdominal wall thickness is an alternative biophysical parameter. It measures the subcutaneous fat of the fetal abdominal wall and has been shown to be significantly higher in GDM compared to non-GDM patients. [9] Among the traditional biophysical parameters, the fetal AC of women with GDM showed a significant rate of increase in the early third trimester compared to the rates of growth of head circumference and femur length in the same period.[10] However, there are conflicting data regarding the relationship between GDM status and fetal AC. No similar research has been conducted among Filipinos who are among the population at risk for diabetes.

This study compared the third trimester fetal AC between adult pregnant patients diagnosed with GDM and those without GDM. It also differentiated GDM patients managed with diet modification alone and those under insulin therapy.

General Objectives: To determine the relationship between third trimester fetal AC and gestational diabetes status of adult pregnant patients.

Specific Objectives

1. To compare third trimester fetal AC between adult pregnant patients diagnosed with GDM and non-GDM pregnant patients.
2. To compare third trimester fetal abdominal circumference between adult pregnant patients diagnosed with GDM managed with diet modification only and on insulin treatment.
3. To compare the fetal and maternal outcomes between GDM and non-GDM pregnant patients.

Methodology

This is a retrospective cohort study of adult Filipino pregnant patients, aged 19 years old and above, with third trimester fetal AC, and 75-gram OGTT between 24 to 28 weeks AOG, and who were admitted for delivery at The Medical City from January 2016 to May 2022. The study population was divided into those diagnosed with GDM (the GDM group) and those without GDM or who have normal 75-gram OGTT (the non-GDM group). The diagnosis of GDM was based on IADPSG criteria. The GDM group was further classified into those who were managed with GDM diet alone, i.e., those who were advised for diet modification by their attending physician or nutritionist (GDM-diet), and those started on insulin (GDM-insulin). Patients were excluded if they had history of type 1 or type 2 diabetes mellitus prior to pregnancy, previous GDM pregnancy or delivery of macrosomic baby, hypertension, preeclampsia or eclampsia, end-stage renal disease (ESRD) or malignancy. Women who had previous GDM pregnancy and history of macrosomic babies were excluded because these factors are associated with the risk of progression to Type 2 Diabetes Mellitus. GDM has a recurrence rate of 47.6% and up to 60% of affected women develop type 2 diabetes in the subsequent 10–20 years. Having GDM in a prior pregnancy is a strong risk factor for GDM in a subsequent pregnancy. Furthermore, a prior delivery of a macrosomic baby may indicate a previous GDM diagnosis. Women who had delivered a macrosomic newborn has been shown to have a higher risk to deliver another macrosomia. Fetal macrosomia affects 15-45% of women with GDM.[11,12]

A minimum of 348 pregnant patients with third trimester ultrasound, assuming 50% are with GDM, were required for this study based on a level of significance of 5% and a power of 80% with a medium effect size of GDM status to fetal abdominal circumference equal to 0.3. There were 7,779 institutional deliveries from January 2016 to May 2022 in which 1,415 were GDM. Only 354 patients met the inclusion and exclusion criteria in which 174 were non-GDM patients and 180 were GDM patients.

The study was approved by the hospital's Institutional Review Board Ethics Committee. Medical records of both mother and child were obtained including inpatient clinical records, laboratory records and ultrasound reports. Among the data retrieved were possible confounders and effect modifiers such as maternal age, pre-pregnancy weight (kg), height (m), weight on delivery (kg), body mass index (BMI) on delivery (kg/m^2), obstetric score, and comorbidities. Third trimester ultrasound of fetal AC (cm), along with other biometric parameters such as fetal femoral length (cm), fetal biparietal diameter (cm), fetal head circumference (cm) and estimated fetal weight (kg) were likewise obtained. Further, information on the management of GDM of either diet alone or insulin along with neonatal outcomes such as gestational age at birth (weeks), birth weight (grams), birth length (cm), head circumference (cm), chest circumference (cm), abdominal circumference (cm), the Appearance, Pulse, Grimace, Activity, and

Table I. Maternal Profile of Pregnant Filipino Women With and Without GDM

Parameter	Total (n=354)	GDM (n=180)	Non-GDM (n=174)	p-value
Age, years, Mean ± SD	33.72 ± 4.51	35.06 ± 4.31	32.33 ± 4.31	**<0.001***
Pre-pregnancy weight, kg, Median (IQR)	58 (50-64)	60 (50-65)	55 (50-60)	**0.013†**
Pre-pregnancy height, cm, Median (IQR)	157 (153-161)	157 (154-161)	157 (152-161)	0.959†
Weight on delivery, kg, Median (IQR)	64.99 (59.82-74.50)	65.11 (59.17-75.18)	64.67 (59.90-72.53)	0.627†
Weight change from pre-pregnancy to delivery, kg, Median (IQR)	8.9 (3.5-12.9)	7.3 (1.1-11.9)	9.1 (4.9-13.0)	**0.020**
BMI on delivery, kg/m^2, Median (IQR)	26.9 (23.9-29.7)	27.1 (23.8-30.4)	26.5 (24.1-29.4)	0.468†
Gravidity, Median (IQR)	1 (1-2)	2 (1-3)	1 (1-2)	**<0.001†**
Parity, Median (IQR)	0 (0-1)	1 (0-1)	0 (0-1)	**<0.001†**
Comorbidities, Frequency (%)	102 (28.81)	60 (33.33)	42 (24.14)	0.056‡
Anemia	4 (3.92)	3 (5)	1 (2.38)	0.641§
Asthma	19 (18.63)	13 (21.67)	6 (14.29)	0.442§
COVID-19	14 (13.73)	7 (11.67)	7 (16.67)	0.563§
Thyroid disease	16 (15.69)	12 (20)	4 (9.52)	0.178§
GDM management (if with GDM) Frequency (%)				-
Diet-managed	116 (64.44)	116 (64.44)	-	
Insulin-requiring	64 (35.56)	64 (35.56)	-	

Statistical tests used: *, Independent t-test; †, Mann-Whitney U test; ‡, Chi-square test; §, Fisher's Exact test

Table II. Third Trimester Ultrasound Results, Median (IQR)

Parameters	Total (n=354)	GDM (n = 180)			Non-GDM (n=174)	p-value	
		Diet-controlled (n=116)	Insulin-requiring (n=64)	Total GDM		Diet vs Insulin	GDM vs non-GDM
AOG when ultrasound was taken, weeks	37 (36-38)	38 (36-38)	38 (36-38)	38 (36-38)	37 (36-39)	0.088	**0.027**
Fetal abdominal circumference, cm	32.3 (30.7-33.9)	37 (36-38)	37 (36-38)	32.5 (30.8-34.1)	32.2 (30.6-33.7)	0.368	0.218
36 weeks	31.6 (30.7-33.0)	32.2 (30.7-34.0)	32.2 (30.7-34.0)	31.9 (30.9-33.0)	31.4 (30.6-32.9)	**0.018**	0.319
37 weeks	32.8 (31.8-33.9)	32.8 (31.3-34.1)	32.8 (31.3-34.1)	33.2 (32.1-34.6)	32.4 (31.0-32.9)	0.434	**0.001**
38 weeks	33.2 (32.0-34.4)	31.3 (30.7-32.9)	31.3 (30.7-32.9)	33.5 (32.3-35.0)	32.8 (31.3-34.2)	0.197	0.269
39 weeks	33.7 (32.9-34.8)	32.9 (31.8-33.6)	32.9 (31.8-33.6)	34.0 (32.7-34.7)	33.4 (33.0-34.8)	0.165	0.969
Fetal femoral length, cm	6.8 (6.5-7.0)	33.2 (32.0-34.6)	33.2 (32.0-34.6)	6.8 (6.5-7.0)	6.8 (6.6-7.0)	0.132	0.645
Fetal biparietal diameter, cm	8.9 (8.7-9.2)	33.9 (32.9-34.6)	33.9 (32.9-34.6)	9.0 (8.7-9.2)	8.9 (8.7-9.2)	0.544	0.507
Estimated fetal weight, grams	2851 (2449-3124)	33.2 (32.3-34.2)	33.2 (32.3-34.2)	2867 (2446-3215)	2830 (2459-3099)	0.270	0.466

Statistical tests used: Mann-Whitney U test

Respiration (APGAR) score at 1 minute and 5 minutes, size for gestational age, presence of neonatal hypoglycemia and admission to Neonatal Intensive Care Unit (NICU) were also collected. For the size for gestational age, the institution used the Lubchenco reference curve for newborns in which growth chart was used to plot newborn's weight based on maturity testing. Small for gestational age (SGA) is defined as birth weight less than the 10th percentile, and large for gestational age (LGA) infants weigh greater than the 90th percentile for gestational age.[13] These were collected to obtain holistic profiles of patients and for use in adjusting for possible biases. Finally, maternal outcomes such as mode of delivery and complications were gathered as well.

Statistical Analysis. Descriptive statistics were used to summarize the general and clinical characteristics of the participants. Frequency and proportion were used for categorical variables (nominal/ordinal), mean and standard deviation for normally distributed interval/ratio variables, and median and interquartile range (IQR) for non-normally distributed interval/ratio variables.

Independent t-test was used to compare the means of normally distributed continuous variables between exposed and non-exposed groups (i.e., GDM vs non-GDM; GDM-diet vs GDM-insulin). Separate hypothesis tests to compare GDM-diet vs GDM-insulin were performed to account for the possible influence of different GDM management. The Mann-Whitney U test was used to compare non-normally distributed continuous variables between groups. Chi-square test was used to compare the categorical outcomes between groups. If the expected percentages in the cells are less than 5%, Fisher's Exact test was used instead. Beta coefficients and the corresponding 95% confidence

Table III. Maternal outcomes, Frequency (%)

	Total (n=354)	GDM (n=180)	Non-GDM (n=174)	p-value
Mode of delivery				<0.001
NSD	147 (41.53)	54 (30)	93 (53.45)	
CS	207 (58.47)	126 (70)	81 (46.55)	
Maternal complications	68 (19.21)	64 (35.56)	4 (2.30)	<0.001

Statistical tests used: Fisher's Exact test

Table IV. Neonatal Outcomes

Parameter	Total (n=354)	GDM (n = 180)			Non-GDM (n=174)	p-value	
		Diet-controlled (n=116)	Insulin-requiring (n=64)	Total GDM		Diet vs Insulin	GDM vs non-GDM
Gestational age at birth, weeks (Median (IQR)	38 (38-39)	38 (38-39)	38 (37-38)	38 (38-39)	39 (38-40)	0.017†	<.001†
Sex						0.928‡	0.834‡
Male (Frequency (%)	179 (50.56)	59 (50.86)	33 (51.56)	92 (51.11)	87 (50)		
Female (Frequency (%)	175 (49.44)	57 (49.14)	31 (48.44)	88 (48.89)	87 (50)		
Birthweight, grams (Mean ± SD)	3075 ± 485	3027± 473	3261± 560	3110 ± 517	3038 ± 449	0.004†	0.162†
Birth length, cm (Median (IQR)	48 (47-50)	48 (46-50)	48 (45-49)	49 (47-50)	48 (46-49)	0.418†	0.002†
Head circumference, cm (Median (IQR)	34 (33-35)	34 (33-35)	34 (33-35)	34 (33-35)	34 (33-35)	0.232†	0.525†
Chest circumference, cm (Median (IQR)	32 (31-34)	32 (31-33)	33 (31-34)	33 (31-34)	32 (31-34)	0.027†	0.880†
Abdominal circumference, cm (Mean ± SD)	28.97± 2.32	28.80±2.40	29.59±2.80	29.97±2.57	28.85±2.04	0.047†	0.359†
APGAR score							
1 minute (Median (IQR)	9 (8-9)	9 (8-9)	9 (8-9)	9 (8-9)	9 (8-9)	0.748†	0.367†
5 minutes (Median (IQR)`	9 (9-9)	9 (9-9)	9 (9-9)	9 (9-9)	9 (9-9)	0.648†	0.969†
Size for gestational age						0.192§	0.133§
SGA (Frequency (%)	8 (2.26)	3 (2.59)	1 (1.56)	4 (2.22)	4 (2.3)		
AGA (Frequency (%)	312 (88.14)	102 (87.93)	51 (79.69)	153 (85)	159 (91.38)		
LGA (Frequency (%)	34 (9.6)	11 (9.48)	12 (18.75)	23 (12.78)	11 (6.32)		
Neonatal hypoglycemia (Frequency (%)	14 (7.78)	9 (7.76)	5 (7.81)	-	14 (7.78)	>0.999 §	-
NICU admission (Frequency (%)	31 (8.76)	14 (12.07)	10 (15.63)	24 (13.33)	7 (4.02)	0.501‡	0.002‡

Statistical tests used: *, Independent t-test; †, Mann-Whitney U test; ‡, Chi-square test; §, Fisher's Exact test

Table V. Association of GDM status and GDM management with fetal abdominal circumference (n=354)

	Beta coefficient (95% CI)	*p-value*
GDM status*		
Normoglycemic	Reference	-
GDM	0.60 (0.18 – 1.03)	0.006
GDM management*		
Diet-controlled	Reference	-
Insulin-requiring	0.51 (-0.15 – 1.17)	0.127

*Estimate adjusted for AOG when ultrasound was taken

intervals from multiple linear regression were used to determine the correlation between GDM status and fetal AC, accounting for potential confounders such as the demographic variables (maternal age, pre-pregnancy weight (kg), height (m), weight during delivery (kg), body mass index (BMI) on delivery (kg/m^2), obstetric score, and comorbidities). Diet modification vs insulin therapy was also included in the linear regression model to account for GDM. Missing variables were neither replaced nor estimated. The null hypothesis was rejected at 0.05α-level of significance. *Stata 15.0*™ (StataCorp SE, College Station, TX, USA) was used for data analysis.

Results

Included in the study were a total of 354 pregnant patients, 180 of whom had GDM (*Table I*). As seen in

Table I, based on their maternal profile, those with GDM were found to be significantly older (35.06 vs 32.33 years, *p<0.001*), have heavier pre-pregnancy weight (60 vs 55 kgs, *p=0.013*), and of were higher gravidity (2 vs 1, *p<0.001*) and parity (1 vs 0, *p<0.001*). On the other hand, weight change from pre- pregnancy to delivery was significantly higher in non-GDM patients (*Table I*), at 9.1 vs 7.3 kg for GDM patients, at *p = 0.020*.

Third trimester ultrasound findings are shown in *Table II*. The median AOG at time of ultrasound was significantly higher at 38 weeks for GDM patients (vs 37 weeks for non-GDM, *p*=.027) and the fetal AC at 37 weeks was wider at a median of 33.2 cm (vs 32.4 cm, *p*=.001). More specifically, in terms of grouping by GDM management, Table 2 also shows that, among those who were insulin-requiring, at 36 weeks AOG, the fetal AC was wider compared to the diet-controlled group (*p=0.018*).

Maternal outcomes are displayed in *Table III*. Note that compared to non-GDM, those with GDM had a higher incidence of cesarean section (CS) delivery (70% vs 46.55%, *p<.001*) and maternal complications (35.56% v 2.3%, *p<0.001*). The neonatal outcomes in *Table IV* indicate that, as against non-GDM, neonates delivered from the GDM group, on the average, had lower AOG at birth (38 vs 39 weeks, *p<0.001*), longer birth length (49 vs 48 cm, *p=0.002*), and higher admissions in the NICU (13.33% vs 4.02%, *p=0.002*). Although not statistically significant, it should be noted that the birthweight of neonates in the GDM group was heavier at a mean of 3.11 kg compared to 3.04 kg in the non-GDM group. Moreover, there were twice as many neonates considered to be LGA in the GDM group (12.78% vs 6.32%).

In terms of diabetes management within the GDM group, *Table IV* also shows that, compared to the diet-controlled, neonates who were born to mothers who were insulin-requiring, on the average, were younger in gestational age at birth (38 weeks, IQR = 37-38 weeks, *p=0.017*), heavier based on birth weight (3.2 kgs, *p=0.004*), and had wider chest circumference (33 cm, *p=0.027*) and abdominal circumference (29.6 cm, *p=0.047*).

The foregoing results suggest a direct correlation between GDM status and fetal AC. This is evident in *Table V*. Adjusting for age of gestation when ultrasound was taken, we would expect the fetal AC from mothers with GDM to be 0.60 cm larger, on the average, compared to those from non-GDM patients (*p=0.006*). On the other hand, there is insufficient evidence to demonstrate an association between the type of GDM management and fetal AC among mothers with GDM (*Table V*). Adjusting for age of gestation when ultrasound was taken, we would expect the fetal abdominal circumference from insulin-requiring mothers to be 0.51 cm larger, on the average, compared to those from diet-controlled mothers. However, the 95% CI ranged from –0.15 to $\pm$1.17 cm.

Discussion

This retrospective cohort study determined the association between GDM, GDM type of management, and third trimester fetal AC among Filipino pregnant adult patients. We found that fetal AC in the GDM group was significantly larger, however there was no significant association between GDM management type and fetal AC. As to maternal and neonatal outcomes, those in the GDM group (vs non-GDM), had higher rates of CS delivery, maternal complications; and neonates with lower AOG at birth, longer birth length, and higher number of NICU admissions.

Accurate third trimester ultrasound is essential in fetal development monitoring. Our study findings support the result from Sovio, et al., in which GDM, together with maternal obesity, was associated with two-fold risk of fetal AC > 90th percentile in pregnant patients at 28 weeks of gestation.[14] This, however, is in contrast to the findings of Lertvutivivat et al., where no association was found. It is important to note that in that study, there is a significant difference in the fetal anterior abdominal wall thickness in GDM patients compared to non-GDM patients at 28-30 weeks and 32-34 weeks.[4] Our analysis showed that upon adjustment for AOG at time of ultrasound, fetal AC in GDM group were 0.6 cm larger, consistent with previous study findings that showed that excess fetal fat is deposited more in the fetal abdominal wall area affecting the fetal liver measurements which is significantly larger than their GDM counterpart.[9]

In terms of grouping by GDM management, there was insufficient evidence to demonstrate an association between the type of GDM management and fetal AC. This might be due to the fact that fetal AC is not affected by the type of management of the GDM but more on the control of blood sugar of pregnant women. Additionally, in the review by Ruiz-Palacios, et al., they outlined the complex relationship between GDM management and fetal abdominal circumference, emphasizing mechanisms that influence nutrient transfer to the fetus. During the third trimester, GDM commonly involves maternal hyperlipidemia and hyperinsulinemia, impacting placental structure and activating insulin pathways like p-ERK and p-Akt. Treatment with exogenous insulin intensifies these effects, potentially increasing placental lipid carriers and fetal lipid transport while reducing triglyceride levels in cord blood. This insulin resistance early in pregnancy alters placental structure and insulin signaling, contributing to fetal adiposity and possibly programming obesity.[15] A more sophisticated methodology may be required to further investigate this association.

As to the maternal outcomes, the high proportion of CS delivery and complications in the GDM group is consistent with previous studies in which GDM increased the risk of adverse maternal outcomes including CS delivery, induction of labor, and postpartum hemorrhage.[6,4,16] Another possible reason for higher CS rates in the GDM group is that most of these patients were admitted for induction of labor compared to the

non-GDM patients who were expectantly managed. The decision to perform CS also depends on the threshold of the attending obstetrician due to different maternal and fetal complications from GDM.[17,18] A study by Shindo et al., reported higher rates of elective CS among women diagnosed with GDM in the third trimester through a 75 g OGTT, highlighting the clinical impact of late GDM diagnosis on delivery methods.[19] However, they found no significant difference in the frequency of diabetes-related complications between these women and those with normal glucose tolerance. This suggests repeating GDM screening via OGTT in late pregnancy, as advocated by Fonseca et al., who noted a 13.5% incidence of abnormal results among previously normal OGTT tests between 32-36 weeks AOG, could be beneficial.[20] Although GDM diagnosed in the third trimester increases the risk of CS delivery and post-term induction of labor, our study did not find an increase in serious maternal or perinatal adverse outcomes, further emphasizing the importance of fetal AC as a valuable biomarker for monitoring GDM in prenatal care consultations or follow-ups.

In our study, the neonates delivered from the GDM group, on the average, have lower AOG at birth at 38 weeks. GDM is associated with increased risk of preterm and early delivery.[16] For poorly controlled GDM patients who were either on diet or insulin, delivery of 37 weeks AOG may be undertaken while those on well-controlled on diabetic diet must deliver by 40 weeks AOG.[21] Also, similar with other studies, our study showed a higher proportion of neonates from the GDM group was admitted at the NICU.[16] Most obstetricians in our institution would prefer to admit neonates of GDM patients to NICU for closer subsequent monitoring of episodes of hypoglycemia.

Despite variation in findings across studies, our results highlight the clinical relevance of monitoring fetal AC in GDM pregnancies, complementing existing guidelines recommending regular fetal biometry assessments for improved pregnancy management. The currently established reference values for fetal AC for normal pregnancy are based on Western demographics and there are no available Filipino reference values as of this date. Knowing these values and the fetal AC adjusted according to AOG measured in this study, we can determine the reference value of third trimester fetal AC of GDM patients.

Limitations of our study include its retrospective design within a single institution, potentially limiting generalizability to broader populations. Furthermore, the lack of detailed data on blood glucose control among GDM patients in our dataset may have influenced fetal AC outcomes and should be addressed in future research. Moving forward, prospective multicenter studies are warranted to validate our findings and establish Filipino-specific reference values for fetal AC in GDM pregnancies. Future research should also explore the impact of stringent glucose control protocols on fetal AC and subsequent neonatal outcomes to optimize prenatal care strategies for women with GDM.

Conclusion

Third trimester fetal AC is significantly larger in women with GDM compared to non-GDM women, regardless of the management method. Monitoring fetal AC in the third trimester is important for prenatal care in GDM pregnancies to mitigate associated maternal and neonatal risks.

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