SECOND TRIMESTER FETAL ABDOMINAL CIRCUMFERENCE MEASUREMENT IN PREDICTION OF LARGE FOR GESTATIONAL AGE NEONATES AT BIRTH Hossam Ibrahim Azab, Samir Mohammed El-Sayed, Mai Mahrous Mohammed Mahrous Department of Obstetrics and Gynecology, Faculty of Medicine, Alexandria University.

INTRODUCTION

Fetal macrosomia is defined by most sources as a birth weight more than 4 kg, while large for gestational age (LGA) is defined as a newborn whose weight is more than the 90th centile. Fetal macrosomia prevalence varies worldwide based on a broad range of factors, including as heredity, ethnicity, nutritional condition, and physiological and pathological variables. Fetal macrosomia has been reported to be more common in developed nations, with an increase of 15-20%. This is likely due to the rise in maternal obesity and diabetes mellitus, but the exact percentages vary between countries.

Both maternal and fetal risk factors contribute to the basic pathophysiology of macrosomia. On the other hand, maternal hyperglycemia seems to be the main factor in the development of macrosomia. There are a number of risks connected with LGA and fetal macrosomia. Factors such as maternal height, parity, ethnicity, age of the mother, gender of the newborn, and history of having a baby that was large for their gestational age are included.

Macrosomia is considered risky for the mother and the baby, which may cause major problems. Macrosomia raises the odds of caesarean section, postpartum hemorrhage, vaginal and perineal tears for the mother, and brachial plexus injury, shoulder dystocia, clavicle fractures, hospitalization, and intensive care unit admissions for the neonate.

The most commonly used parameter to determine fetal weight is abdominal circumference (AC).

AIM OF THE WORK

The aim of this work was to see if there was a correlation between having an increased AC measurement (above the 90th percentile) during a second trimester scan (between 18 and 22 weeks of gestational age) and having a baby that was LGA (> 90th percentile) when it was born.

PATIENTS AND METHODS

Patients:

This prospective study was carried out on 75 pregnant women with no medical comorbidities. **Inclusion criteria:**

- 1- Gestational age between 18-22 weeks.
- 3- BMI < 30 kg m^2 .
- **Exclusion Criteria:**
- Multifetal gestation.
- Pre-gestational diabetes.
- Thyroid disorders.
- Fetal congenital anomalies.

- 2- Singleton pregnancy.
- 4- Expected delivery at term pregnancy.
- Gestational diabetes.
- Hypertensive disorders with pregnancy.
- BMI \geq 30 kg\m².

Methods: Seventy Five female patients were included after they met the eligibility criteria and obtaining written consent. Every patient in the study was subjected to:

Detailed medical history, clinical examination and laboratory investigations excluding hypertension, thyroid diseases were done. Gestational diabetes was excluded by conducting 50-gram oral glucose challenge test at 24-28 weeks gestational age and those above the threshold of 140 gm/dl after 1 hour were excluded from the study.

The study was carried out in obstetrics and gynecology department in Alexandria University by a single sonographer using Mindray DC-70 ultrasound machine to measure AC (abdominal circumference) at 18-22 weeks gestational age after exclusion of fetal congenital anomalies.

The AC (abdominal circumference) measurements were obtained by following the recommendations of the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) where transverse section of the fetal abdomen (as circular as possible) was obtained with umbilical vein at the level of the portal sinus and stomach bubble are visualized and no heart nor kidneys were visible. The AC is measured at the outer surface of the skin line, with ellipse, the calipers were placed on the outer borders of the body outline, from the posterior aspect (skin covering the spine) to the anterior abdominal wall.

All fetuses with AC above 90th percentile between 18-22 weeks gestational age, according to WHO fetal growth charts and cutoff level of AC at this gestational age (136mm-186mm), were recruited and followed up until birth and birth weight was evaluated for being LGA (>90th percentile for gestational age) or not.

RESULTS

Table (1) shows an average of AC in mm 176.03±16.01 for females with LGA and an AC ranging from 136-190 mm for females without LGA babies, with a mean value of 164.64±16.42. Statistical analysis revealed a significant relationship concerning AC and LGA baby (P<0.05).

Table 1:Relation between incidence of LGA baby and U/S findings (AC according to gestational age).

	Incidence of LGA baby				
	No	Yes			
AC					
Range	136.0-190.0	136.0-195.0			
Mean	164.64	176.03			
SD	16.42	16.01			

T= student t-test

T test **P** value 3.037 0.003*

Table (2), shows the AC's sensitivity, specificity, and accuracy in predicting an LGA infant. An AC cutoff value of 165 was shown to have a sensitivity of 72.2%, a specificity of 56.4%, a likelihood ratio of 1.7, and a total accuracy of 64.0%.

Table 2: Accuracy, specificity, and sensitivity of AC in predicting LGA baby.

Variable	AUC	Cut off value	P value			
				PPV	NPV	
AC	0.70	165	0.001	0.60	0.69	
Sensitivity	72.2 %					
Specificity	56.4%					
Accuracy	64%					



CONCLUSIONS

This research showed that, sonographic measurement of fetal AC between 18-22 weeks of gestation is both a sensitive and specific tool for predicting LGA and fetal macrosomia after birth.

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