FETAL MALFORMATIONS AND MATERNAL OBESITY: A CROSS SECTIONAL STUDY AT EL SHATBY UNIVERSITY MATERNITY HOSPITAL

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INTRODUCTION

Obesity is today regarded as a global epidemic, since its effects on mortality and morbidity in pediatric patients and adults are becoming more and more significant and according to recent statistics, 650 million persons worldwide are obese and nearly 1.9 billion are overweight. Obesity-related deaths have been estimated to be in an increase and reach millions in number.

For the growing fetus or embryo, maternal obesity offers a changed genetic, hormonal, and biochemical environment that affects fetal growth and organ development.

Obese women carry a higher risk of fetal death, congenital abnormalities, and interrupted growth patterns in their offspring, of which increases perinatal mortality.

AIM OF THE WORK

Correlate the frequency of maternal obesity in pregnant women diagnosed with fetal structural malformations by comparing it with the frequency of those with normal maternal body mass index and identifying and rank different types of fetal structural malformations obtained by second trimester ultrasound scan in obese pregnant women.

PATIENTS AND METHODS

It is a cross sectional study where by 140 singleton pregnant women who went through a second trimester anomaly ultrasound scan with fetal structural malformations were selected, A full informed consent was taken from all the patients before the beginning of the study.

Maternal body mass index was calculated from early pregnancy self-reported weight and height at the first prenatal visit and classified as-*Normal* when between 18.5kg/m^2 and 24.9 kg/m^2.

-*Overweight* when it was between 25kg/m^2 and 29.9kg/m^2.

-*Obese* when it was more than or equal to 30kg/m^2.

RESULTS

Fetal structural malformations identified in the study group
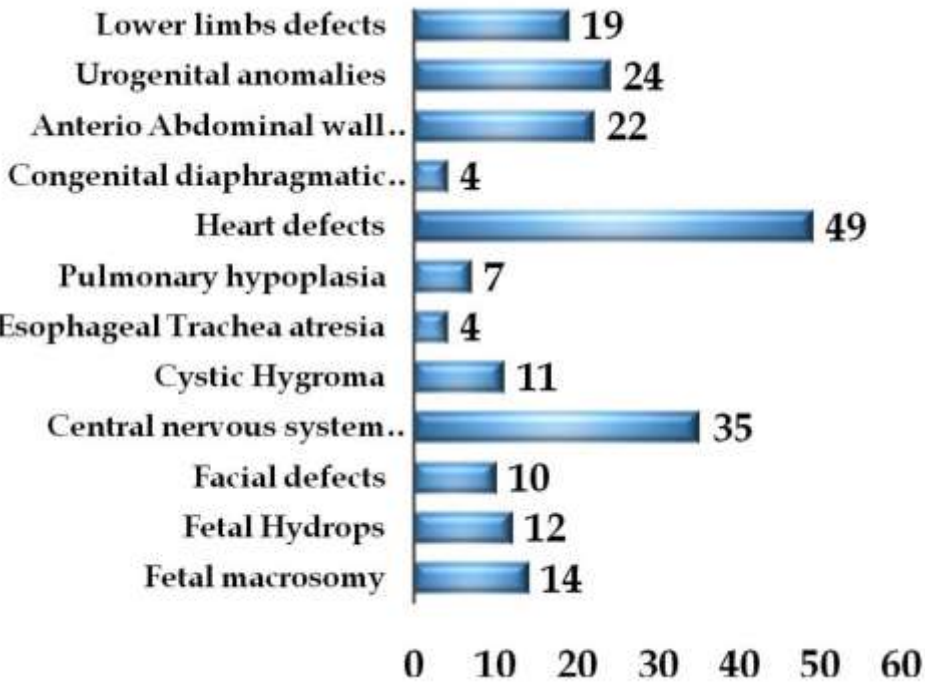

Table 1: Comparison between the two studied groups according to different parameters

	Total (n = 140)		Normal (18.5 - <25) (n = 50)		Pre-obesity (25 - <30) (n = 60)		Obese I (≥30) (n = 30)		χ^2	MC p
	No.	%	No.	%	No.	%	No.	%		
Cystic hygroma	11	7.9	1	2.0	4	6.7	6	20.0	7.408*	MCp=0.022*
Sig. bet. Grps.			FEp$_1$=0.244, FEp$_2$=0.010*, FEp$_3$=0.078							
Esophageal Trachea atresia	4	2.9	0	0.0	2	3.3	2	6.7	3.009	MCp=0.199
Pulmonary hypoplasia	7	5.0	0	0.0	4	6.7	3	10.0	4.968	MCp=0.057
Heart defects	49	35.0	13	26.0	26	43.3	10	33.3	3.648	0.161
Congenital diaphragmatic hernia	4	2.9	0	0.0	4	6.7	0	0.0	3.923	MCp=0.078
Lower limbs deformities	19	13.6	10	20.0	6	10.0	3	10.0	2.740	0.254

χ^2: **Chi square test**   FE: **Fisher Exact**   MC: **Monte Carlo**
p: p value for comparing between the three studied groups   p$_1$: p value for comparing between **Normal** and **Pre-obesity**
p$_2$: p value for comparing between **Normal** and **Obese I**   p$_3$: p value for comparing between **Pre-obesity** and **Obese I**
*: Statistically significant at p ≤ 0.05

Table 2: Comparison between the two studied groups according to fetal macrosomy and hydrops

	Total (n = 140)		Normal (18.5 - <25) (n = 50)		Pre-obesity (25 - <30) (n = 60)		Obese I (≥30) (n = 30)		χ^2	p
	No.	%	No.	%	No.	%	No.	%		
Fetal macrosomy	14	10.0	0	0.0	10	16.7	4	13.3	8.889*	0.012*
Sig.bet.Grps			p$_1$=0.002*, p$_2$=0.017*, p$_3$= 0.017*							
Fetal hydrops	12	8.6	4	8.0	2	3.3	6	20.0	6.366*	MCp=0.031*
Sig.bet.Grps			p$_1$=0.408, p$_2$=0.164, p$_3$=0.164							

χ^2: **Chi square test**   MC: **Monte Carlo**
p$_1$: p value for comparing between **Normal** and **Pre-obesity**
p$_2$: p value for comparing between **Normal** and **Obese I**
p$_3$: p value for comparing between **Pre-obesity** and **Obese I**
*: Statistically significant at p ≤ 0.05

CONCLUSION

The current study showed that most common fetal structural malformations that were found are; Heart defects leading with total number of 49(35%) cases followed by Central Nervous systems anomalies with 35(25%) cases, Urogenital anomalies 24(17.1%) cases, anterior abdominal wall defects 22(15.7%) cases, lower limb deformities 19(13.6%) cases, Fetal macrosomia 14(10%) cases, Fetal Hydrops 12(8.6%) cases, Cystic hygroma 11(7.9%) cases, Facial defects 10(7.1%) cases, Pulmonary hypoplasia 7(5%) and the least being Congenital diaphragmatic hernia and Esophageal Trachea atresia each with 4(2.9%) cases.

Fetal macrosomia, cystic hygroma and facial defects were the only structural malformations that showed a direct relation with increase in body mass index, Gastroschisis showed more relation with normal body mass index and all others remaining congenital malformations showed no relation with equal distribution between the groups.