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IMPACT OF MATERNAL OBESITY ON MATERNAL AND FETAL OUTCOME IN PREGNANT WOMEN AT SIMS, HAPUR, UTTAR PRADESH, INDIA

Obstetrics & Gynaecology

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ABSTRACT

Background: Obesity is a significant problem in the world and maternal obesity poses a great risk for both mother and fetus. This study aims to determine the impact of maternal obesity on maternal and fetal outcome in pregnant women. **Material and Methods:** The study was conducted on 200 pregnant women in their first trimester with viable singleton pregnancy. Based on BMI,patients were divided into two groups.The obese group (BMI>25) of 100 women compared to non obese group (BMI<25) of 100 women for their feto-maternal outcome. **Results:** There was increased incidence of maternal and fetal complications in obese group in comparison to non obese group. Preeclampsia was seen in 41.9% vs 12.3%, GDM in 11.8% vs 8.2%, induction of labour in 37.6% vs 11.3%, LSCS in 45.1% vs 13.4% in obese as compared to non obese group respectively. Postpartum haemorrhage in 20.4% vs 9.2%,macrosomia in 11.8% vs 1%, low Apgar score in 10% vs 3.1%,NICU admission in 15.5% vs 7.2% was higher in obese group as compared to non obese. **Conclusions:** obesity is a modifiable risk factor and associated with antepartum, intrapartum, postpartum and fetal complications. Preconceptional counseling and weight loss before pregnancy should be encouraged.

KEYWORDS

Maternal obesity; BMI; feto-maternal outcome

INTRODUCTION

Obesity is a significant problem in the world and maternal obesity poses a great risk for both mother and fetus. The most commonly used measurement for defining obesity is BMI, which refers to an individual's weight in kilograms divided by the square of his or her height in meters.

Due to economic, technologic and lifestyle changes, people are eating more and moving less. Maternal obesity can result in adverse outcomes for both women and fetuses. The maternal risks during pregnancy include gestational diabetes and preeclampsia and landing for caesarean sections[1].

Maternal obesity increases the risk of a number of pregnancy complications, including antepartum such as spontaneous abortion(after spontaneous conception or after IVF conception),recurrent miscarriage, congenital anomalies, hypertensive disorder, gestational diabetes and intrauterine fetal demise. Intrapartum complications including labour induction, dysfunctional labour & caesarean delivery. Postpartum complications including postpartum haemorrhage, endomyometritis, episiotomy infection, lactation dysfunction & prolonged hospitalization[2].

There is also an increased risk of anesthetic complications, such as failed intubation at the time of general endotracheal anesthesia[3].

In addition to an increased rate of operative delivery, obese women are also at increased risk of intraoperative complications, including excessive blood loss, increased infectious morbidity and thromboembolic events.

For women, these risks include heart disease and metabolic syndrome. Children have a risk of future obesity and heart disease. Women and their offspring are at increased risk for diabetes. Excessive weight gain during pregnancy and postpartum retention of pregnancy weight gain are significant risk factors for later obesity in women[4].

The fetus is at increased risk for macrosomia, stillbirth, congenital anomalies and metabolic syndrome. Obesity in pregnancy can also affect health later in life for both mother and child.

According to uterofetal programming hypothesis(Baker hypothesis) size at birth related to the risk of developing disease later in life[5].

At any single point in pregnancy, however, obese women have higher insulin resistance (lower insulin sensitivity) than women of normal weight, which results in increased availability of lipids for fetal growth and development[6].

MATERIALAND METHODS:

This was a prospective and observational study conducted at obstetrics and gynaecology department, Saraswathi institute of medical sciences, Hapur, U.P after approval by Institutional Ethical committee over a period from November 2020 to June 2022.The study was conducted on 200 patients in their first trimester with viable singleton pregnancy after obtaining proper informed consent. Women with twins,triplets,preexisting medical disease and with pregnancy related complications were excluded.

Their BMI was calculated by quetelet index, They were divided into two groups on the basis of BMI :

Control - 100 patients with BMI<25kg/m2
Case - 100 patients with BMI >25kg/m2.

Blood samples were obtained from each participant for routine and specific investigations (GCT, Lipid profile).

Patients were advised atleast five follow up visits at SIMS and were follwed up till delivery.

Maternal outcome were studied in terms of antepartum complications such as spontaneous abortion, hypertensive disorders, Gestational diabetes mellitus, fetal growth restrictions, Macrosomia, fetal demise, intrapartum complications as dysfunctional labour & caesarean delivery and postpartum complications such as postpartum haemorrhage, wound sepsis.

After delivery the fetal outcome were thoroughly assessed by the APGAR score, complications such as NICU admission, neonatal death were studied.

All results were analysed statistically with the help of statistical tools, techniques and tests such as chi-square test and paired t- test ,P value of less than 0.05 was considered as statistical significant.

Results :

Total 200 pregnant women were divided into two groups

Among these patients 3 patients had spontaneous abortion in control group while 7 patients had spontaneous abortion in case group. So, maternal complications in second and third trimester was observed in

97 patients in control group and 93 patients in case group.

Table 1 shows the distribution of age according to BMI.

Age In years	BMI				p value
	<25	>25			
	N	%	N	%	0.09
<30	87	87	78	78	
>30	13	13	22	22	
Total	100		100		

Majority of the patients belongs to <30 yr age group

Table 2. shows the distribution of gravida according to BMI

Gravida	BMI				p value
	<25	>25			
	N	%	N	%	0.29
Primi	38	38	31	31	
Multi	62	62	69	69	
Total	100		100		

In this table,62% & 38%of the patients of control group were multigravida & primigravida respectively, while 69% of the patients of case group were multigravida.

In this study we found that there were more incidence of abnormal weight gain,lipid profile and glucose tolerance in obese patients in comparison to non obese patients although no significant correlation found.This study showed that spontaneous abortion were more in obese patients than non obese patients but statistically not significant.

Table 4 depicts that 41.9% of obese group were developed preeclampsia as compared to 12.37% of non obese group and showed significant correlation with a p value of 0.0001.The development of eclampsia and GDM was found to be more in obese patients as compared to non obese patients although no significant correlation found.

Table 3 shows correlation of weight gain, lipid profile & glucose tolerance

Parameters	BMI					p value
	<25	> 25				
	Count	N %	Count	N%		
Weight Gain	Abnormal	12	12	26	26	0.016
	Normal	88	88	74	74	
Lipid profile	Abnormal	3	3	9	9	0.074
	Normal	97	97	91	91	
Glucose tolerance	Abnormal	8	8	11	11	0.469
	Normal	92	92	89	89	

Table 4 shows Antenatal outcome with BMI :

Antenatal outcome	BMI				p value
	<25		>25		
	Count	%	Count	%	
Spontaneous abortion	3	3	7	7	0.194
Pre eclampsia	12	12.37	39	41.9	0.0001
Eclampsia	1	1.03	2	2.1	0.53
GDM	8	8.2	11	11.8	0.41

Table 5 shows the Intranatal and Postnatal outcome with BMI

Parameter	BMI				p value
	<25		> 25		
	Count	%	Count	%	
IOL	11	11 .34	35	37.6	0.0001
LSCS	13	13.4	42	45.1	0.0001
PPH	9	9.27	19	20.4	0.03
Wound infection	6	6.61	21	22.5	0.001

Table 5 showed that induction of labour was higher in obese group in comparison to non obese group(37.6% vs 11.34%). We also found that there is increase in incidence of LSCS with obese group as compared to non obese group because of risk of shoulder dystocia, macrosomia, failed induction and poor myometrial contractility. The p value is 0.0001 which shows significance correlation. Postnatal complications such as PPH and wound infections were significantly higher in obese patients because of atonicity and delayed healing.

Table 6 shows the perinatal outcome in non obese and obese group

Parameters		BMI < 25		BMI > 25		p value
		Count	%	Count	%	
Macrosomia		1	1.03	11	11.8	0.0029
Low Apgar Score		3	3.1	9	10	0.056
NICU		7	7.29	14	15.5	0.075
Baby	Live	96	98.9	90	96.7	0.291
	Dead	1	1.03	3	3.22	
Neonatal Death		1	1	1	1	0.96
Mean baby weight		2.65		3.26		0.001

Above table shows that incidence of macrosomia was more in obese as compared to non obes group with a significant p value of 0.0029.while no significant correlation found between low Apgar score, NICU admission, neonatal death with BMI.In this study intrauterine death were 1 out of 97control group, while in cases IUD were 3 out of 93 patients(excluding spontaneous abortions).

Above table shows that average birth weight in women with BMI>25kg/m^2 was 3.26 in comparison to average birth weight in babies of non obese women which was 2.65.This was statistically significant with a p value of 0.001.

DISCUSSION:

This study demonstrates that maternal obesity has adverse effect on both mother and fetus.There is higher incidence of preeclampsia, GDM, abortion, IUGR in obese group. **Lashen et al** did a nested control study on obesity and risk of first trimester and recurrent miscarriages & concluded that odds ratio of risk of early abortions and recurrent abortions in obese women were 1.2 & 3.5 which was statistically significant. while in this study spontaneous abortion was seen in 7% of the obese women as compared to 3% of the non obese women with no significant correlation[8]

Ramalakshmi S et al in her study found that incidence of preeclampsia ,eclampsia was significantly higher in obese.[7] This study also concluded that no. of pregnant women developing preeclampsia remained significantly high in obese group as compared to non obese group with a p value of 0.001 Obesity was seen to be associated with increased incidence of induction of labour and LSCS because of increase risk of shoulder dystocia and reluctant to operative vaginal deliveries. Ajmani et al showed that IOL and LSCS incidence is higher in obese group.[6] Postpartum complications like PPH and wound infections were significant in obese.Leddy et al concluded in their studies that there were higher incidence of Postpartum haemorrhage in obese group because of increased amount of subcutaneous fat,reduced immunity and inflammatory reactions in the adipose tissue[10].

Fetal complications like macrosomia, low apgar score, IUD and NICU admission were also observed more in obese pregnant women. Incidences of perinatal mortality were relatively high in obese group as compared to non obese group. In present study the cause of IUD in obese group was eclampsia and other two are of unknown etiology while the cause of IUD in non obese group was PIH and FGR.This study showed no correlation between maternal obesity and IUD.so we can't explain that obesity is independent risk factor for IUD.Avci ME et al concluded significant correlation between obesity and macrosomia & higher incidence of IUD, NICU admission[9].

CONCLUSION:

Obesity is associated with detrimental effect on fetomaternal outcomes. To minimize the adverse effects and improve the obstetric outcome, proper preconceptional counselling regarding healthy lifestyle with balanced diet & optimum exercise should be recommended. Efforts should be done to prevent obesity in reproductive age group and encourage weight loss. This will help us to achieve our goal of healthy mother and healthy baby.

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