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To Assess The Effect of Maternal Bmi on Obstetrical Outcome

KEYWORDS: BMI, obesity, obstetrical outcome, preeclampsia, caesarean section, Gestational Diabetes Mellitus, Macrosomia.

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ABSTRACT *OBJECTIVE:- The objective of this study was to assess the effect of maternal BMI on obstetrical outcome i.e. ante partum complications, mode of delivery, Intra and Post-partum complications and Neonatal outcomes.*

METHODS: A comparative prospective study was carried out in the Obst and Gynae department, J.L.N. Medical College and Associated Group of Hospitals, Ajmer. The study enrolled 200 pregnant women. They were divided into 2 groups based on their BMI, more than or equal to 30.0 kg/m2 were categorized as obese and less than 30 kg/m2 as non obese respectively. Feto-Maternal outcomes in both types of patients were studied.

RESULTS : In this study incidence of PIH (20%), pre-eclampcia (11%), GDM (12%), Need for induction(21%) were significantly increased. Rate of caesarean section was also significantly high in obese group (4% vs 24%). The rate of Intra and post partum complications were higher in obese group but not significant. Incidences of neonatal complications were also higher in obese group but not significant.

CONCLUSION: As the obstetrical outcome is significantly altered due to obesity, we can improve feto-maternal outcome by overcoming obesity. As obesity is a modifiable risk factor, preconception counseling, proper physical exercise, creating awareness regarding health risk associated with obesity should be encouraged and obstetrical complications reduced.

INTRODUCTION : According to WHO obesity is "one of the most visible, yet most neglected, public health problems that threaten to overwhelm both more and less developed as well as developing countries".Obesity is major public health issue. As per 'WHO' it is a 'Killer disease' as HIV and malnutrition.In developing countries like India, Pakistan, Indonesia significant proportion of overweight and obese coexist with malnutrition. Lifestyle modifications over the last few decades have led to a more sedentary life and less physical exercise.[1,2]The BMI (Body Mass Index), or quetelet index is a heuristic proxy for human body fat based on individual's weight and height. It was devised by the "Belgian polymath adolphequetelet during the course of developing "Social physics'.[3]

Obesity in pregnant women is associated with increased risk of gestational diabetes, thromboembolism, hyperlipidemia and preeclampsia.Obese women are more likely to undergo induction of labour, failed induction, operative vaginal delivery, shoulder dystocia, birth canal injuries. Frequency of caesarean section is increased in obese women. Difficulty in regional block anesthesia and difficulty in intubation are also common.There is an increased number of large for gestational age infants, lower APGAR score and poor fetal outcomes.

MATERIALS AND METHOD :
It was a comparative prospective study conducted in department of Obstetrics and Gynaecology, JLN Medical College, Ajmer from Dec 2014 to Nov 2015 in which 200 pregnant women, who were above 24 weeks of gestation presented in labour room were divided into two groups based on their BMI. Group-I ≥30 kg/m^2 is labeled as obese, and Group-II < 30kg/m^2 as non-obese respectively. The inclusion and exclusion criteria were applied and eligible women were selected and informed consent was taken. A complete history and workup and examination was done of the patient. Body mass index (Quetlet's index) is calculated as the person's weight in Kg divided by height's score (in meter).

INCLUSION CRITERIA:
Primigravida.

Singletone pregnancy.

Gestational Age ≥ 24 weeks.

Cephalic presentation.

Age 18 to 35 years.

EXCLUSION CRITERIA:

Multiple pregnancy (i.e. twin, triplet).

Contracted pelvis (i.e. poliomyelitis, kyphosis, scoliosis, kyphoscoliosis).

Non-vertex and non- cephalic presentation.

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Short stature (<145 cm).

Congenital malformed fetus i.e. hydrocephalus, anencephaly, polycystic kidney disease.

Amniotic fluid's abnormalities i.e. moderate to severe polyhydramnios, moderate to severe oligohydramnios.

Maternal complications (i.e.moderate to severe) heart disease, antepartum eclampsia, placenta praevia, abruptio placentae, diabetes mellitus.

RESULTS :

The datas collected during the study are presented in the tabular form along with appropriate graphs and charts and the differences in statistical parameters for different outcomes of group I (BMI≥30) and group II (BMI<30) were tested statistically using appropriate statistical tests.

The mean age of patients in the group I was 25.16 ± 3.22 (mean ± SD) years, and in the group II (control) was 22.72 ± 2.71 years. This difference was found to be statistically significant (p<0.001). Elderly women were more common in the obese group maximum number of patients were of middle socio economic status (69% in BMI > 30 and 47% in BMI < 30). In group I most patients were of middle and higher middle class while in group II most patients were of low and lower middle socio economic status indicating that the economic status plays significant role on BMI. In group I majority of patients were from urban areas (74% vs 26%) while in group II were from rural areas (62% vs 32%). Majority of the women included in the study were housewives (68% in group I and 80% in group II) in both groups while number of working women is more in group I as compare to group II (32% vs 20%). Mean BMI of patients in the group I (BMI >30) was 32.75±1.14 (mean ± SD) kg/m^2, and in the group II (BMI <30) was 23.90 ±1.66 kg/m^2 which was statistically significant (p < 0.001).

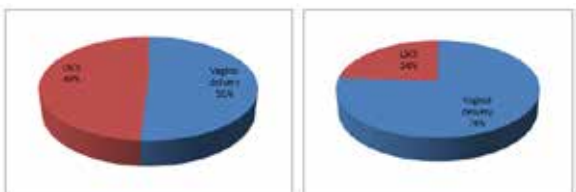
Family h/o hypertension (32% in group I vs 10% in group II) as well as DM (18% vs 7%) were statistically significant common in obese group.

The mean birth weight was 3.16 ± 0.587 (mean ± SD) kg in the group I and 2.80 ± 0.440 kg in the group II. This difference was not found to be statistically not significant (p > 0.05).

Table – 1 Demographic Variables

	Group I (BMI ≥ 30)	Group II (BMI <30)
Mean Maternal age (Years)	25.16	22.72
Socio economic status		
Low	9	20
Lower middle	18	33
Middle	69	47
Higher Middle	4	0
Background		
Rural	26	62
Urban	74	38
Occupation		
Housewife	68	80
Working woman	32	20
Mean BMI(kg/m^2)	32.75	23.90
Family H/O		
Hypertension	32	10
Diabetes Mellitus	18	7
Mean Fetal birth weight (Kg)	3.16	2.80

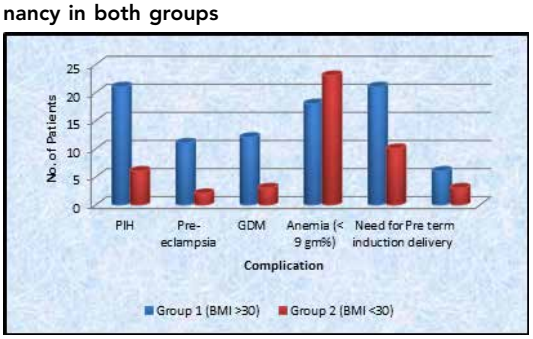
In our study Vaginal delivery was the commonest mode of delivery in both the groups, significantly more in controls than cases (51% versus 76%; p<0.001). Significantly more in controls than cases. Caesarean section rate was however found to be significantly high in obese patients (49% versus 24%; p<0.001).



Incidence of antenatal, intra-partum, post-partum and neonatal complications were higher in group I than group II. Antenatal complications i.e. PIH (21% versus 6%) and pre-eclampsia (11% versus 2%) GDM (12% vs 3%) and Need for induction of labour (21% versus 10%) were significantly high in group I than group II. Preterm delivery was commoner in group I (6% vs 3%) occurrence of anaemia (18% vs 23% was higher in non-obese patients)

Graph – 1

Distribution of Antenatal complications in current pregnancy in both groups



Intrapartum and Post-partum complications i.e. birth canal injury (10% vs 5%), shoulder dystocia (4% vs 1%), PPH (5% vs 2%), surgical wound infection (7% vs 3%) and prolonged hospital stay (9% vs 3%) were higher in group I as compared to group II.

Table – 2

Distribution of Intrapartum and post partum complications and BMI

Complications	Birth Canal injury	Shoulder dystocia	PPH	Surgical wound infection	Prolonged hospital stay
Group I (BMI≥30)	10(10%)	4(4%)	5%	7%	9%
Group II (BMI < 30)	5(5%)	1(1%)	2%	3%	3%
P value	>0.05 N.S.	> 0.05 N.S.	>0.05 N.S.	>0.05 N.S.	> 0.05 N.S.

N.S. = Not significant

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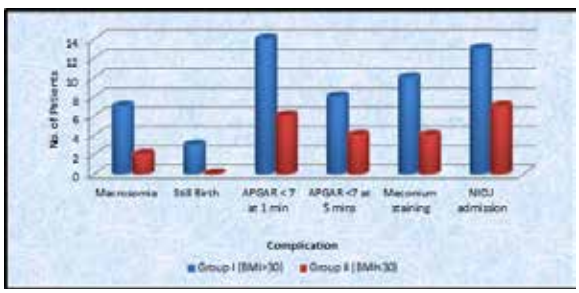
Neonatal complications i.e. fetal macrosomia (7% vs 2%), still births (3% vs 0), APGAR <7 at 1 month (14% vs 6%), APGAR < 7at 5 minute (8% vs 4%), meconium staining of liquid (10% vs 4%) and NICU admission (13% vs 7%) were more common in obese group compared to non-obese group but statistically not significant.

Graph – 2
Distribution of perinatal complication in both groups



DISCUSSION

In the present study the mean maternal age (in years) in the obese group was 25.16 ± 3.224 and in the normal BMI group was 22.72 ± 2.715. Obese women were thus older than controls and the difference was statistically significant (p< 0.001). Jaleel et al[4]found a higher mean age of overweight and obese women (25.6 yrs±3) as compared to those with normal BMI (24.3 yrs ± 2.8), There was a significant association between obesity and family history of hypertension 32% obese women and only 10% non-obese and diabetes mellitus (18% versus 7%). Similar results were obtained by Jaleelet al[4]

In our study the obese woman were at greater risk of PIH (21% versus 6%, p<0.01) and pre-eclampsia (11% versus 2%, p<0.05).Jagielska et al[5] showed that PIH was diagnosed as many as ten times often in pregnant women with obesity than in pregnant women with correct body mass (36% versus 3.45% respectively;El-Gilany et al[6]also found similar results.

Gestational diabetes mellitus (12% versus 3%, p=0.05) was significantly high in obese patients.Similarly results were obtained bySalah et al[7]. Need for induction of labour was significantly high in obese pregnant women (21% versus 10%; p<0.05) similar results were found by Al-Rayyanet al[8]

Vaginal delivery was the commonest mode of delivery in both the groups, significantly more in controls than cases (51% versus 76%; p<0.001). Caesarean section rate was however found to be significantly high in obese patients (49% versus 24%.). Jaleelet al[4] observed an increased frequency of caesarean deliveries in patients with high BMI (36.4% versus 24.2%) but the difference was not statistically significant (p=0.064).

Rate of intra-partum and post-partum complications were also higher in obese group as compare to non-obese group. Incidence of PPH was high in obese women as compared to Controls (5% versus 2%). Shoulder dystocia was encountered in 4% patients in obese group and 1% in control group. This differences was however not significant (4% versus 1%). Similar results were found by Jaleelet al[4] (4% vs 0).

Wound infection was significantly high in obese women (7% versus 3%), prolonged hospital stay (9% vs 3%) and birth canal injury (10% vs 5%) were higher in obese patient as compared to non-obese patients, but statistically not significant. Callaway et al[9] also found that obese women were at increased risk of prolong hospital stay (odds ratio 1.49).Liuet al[10]. found a significant increase in post partumhaemorrhage and perineal rupture in obese patients. Neonatal outcomes were relatively adverse in obese group compared to non-obese group. Rate of fetal macrosomia was higher in obese group (7% vs 2%. P value >0.05) but statistically insignificant.

There were 3 cases of still birth in obese group while none of the women with normal BMI had still birth. This difference was statistically insignificant.Similar results were found byJaleelet al[4]. Poor APGAR score and Meconium staining of liquiar were higher in study group compared to control group but statistically not significant. However Choi et al[11] showed that the Odd ratio for a low APGAR score & were significantly high in the obese group. (Odds ratio = 1.98). In our study 13% neonates needed NICU admission in the obese group while 7% in control group however the difference was statistically insignificant.

CONCLUSION :

This study showed that increasing BMI is associated with increased risk of adverse outcomes for both mother and baby. Compared with a control group, obese pregnant women were found to be at significantly increased risk of developing pregnancy-induced hypertension, pre-eclampsia, and gestational diabetes, Obese patients were also more likely to have induction of labour, caesarean section, macrocosmic baby, postpartum haemorrhage, wound infection and longer hospital stay. Neonates born to obese mothers were also found to be at increased risk of NICU admission.

Recommendation

Preconception counseling should be done for all obese women who are planning a pregnancy.

BMI should be recorded for all women at the initial antinatal visit.

Information concerning the maternal and fetal risks of obesity in pregnancy should be provided.

Obese women should be offered nutrition consultation, and they should be encouraged to follow an exercise program. This should be continued after delivery. Weight gain during pregnancy should be optimum. The American College of Obstetricians and Gynaecologists (ACOG) has recommended that Overweight women (BMI 25-29.9) should be advised to gain no more than 15 to 25 pounds during pregnancy, and obese women (BMI=30) no more than 15 pounds during pregnancy.

Screening for gestational diabetes at the initial prenatal visit with repeated screening later in pregnancy if the results are negative should be done.

REFERENCES :

1. James WP. WHO recognition of the global obesity epidemic. Int J Obes (Lond) 2008:32 Suppl 7;S120-6.
2. Haslam DW, James WP. Obesity. Lancet 2005: 366;1197-1209. International Journal of Advancements in Research & Technology. Vol. 1, Issue I, June-2012.
3. Eknoyan, Garabed. AdolpheQuetelet (1796-1874)-the average man and indices of Obesity. Nephrol Dial Transplant 2008;23(1);47-51.
4. Jaleel R. impact of maternal obesity on pregnancy outcome. J Surg Pak Jan-Mar 2009; 14(1):2-6.

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5. Jagielska I, Duczmal M, Kazdepka- Zieminska A, Socha MW, Szymanski W, Grabiec M. Pregnancy and labour course in women with prepregnancy overweight and obesity. Arch Perinat Med 2010;16(2):101-104.
6. El-Gilany A, Hammad S. Body mass index and obstetric outcomes in pregnant in Saudi Arabia: a prospective cohort study. Ann Saudi Med 2010; 30:376-80.
7. Salah RA, AbdEllah MA, Mohamed OA, Eid HM. Prepregnancy Obesity and Pregnancy Outcome. International Journal of health Sciences, Qassim University 2009; 3:193-198.
8. Al- Rayyan E, Shwayat R, AL-Sumadi A, AL-Ghwyri A, BeniMeri Z, Massadeh M, Twal R. The effect of high maternal body mass index before pregnancy on pregnancy outcome. JRMS July 2010;17(Supp 2):11-15.
9. Callaway LK, Prins JB, Chang AM, et al. the prevalence and impact of overweight and obesity in an Australian obstetric population. Med J Aust 2006; 184:56-9.
10. Liu X, Du J, Wang G, Chen Z, Wang W, Xi Q. Effect pre-pregnancy body mass index on adverse pregnancy outcome in north of china. Arch Gynecol Obstet. 2011; 283(1): 65-70.
11. Choi et al. the effects of pre-pregnancy body mass index and gestational weight gain on perinatal outcomes in Korean women: a retrospective cohort study. Reproductive Biology and Endocrinology 2011 9:6.