

A Study of feto-maternal outcome in high BMI patients



Gynaecology

KEYWORDS: BMI, Obesity, Obstetrical Outcome, PIH, GDM, Caesarean Section

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ABSTRACT

Background:

AIMS: To assess the effect of maternal BMI on complications in pregnancy, mode of delivery, complications of labour and delivery & neonatal outcome.

Methods: A comparative prospective study was carried out in the Obst and Gynae department, MDM Hospital, Jodhpur, Rajasthan. The study enrolled 100 pregnant women. They were divided into 2 groups based on their BMI, more than or equal to 25 kg/m² were categorized as overweight and less than 25 kg/m² as normal weight respectively and effects of maternal BMI on complications in pregnancy, mode of delivery, complications of labour and delivery and neonatal variables were studied and statistical analysis was carried out both groups of patients.

Results: Maternal variable –according to age(<0.05), parity(<0.05), treatment taken for sub fertility/infertility (<0.05), PIH(<0.05), weight gain during pregnancy(<0.05), mode of delivery(<0.05), type of caesarean section(<0.05), wound infection (<0.05), PPH according to mode of delivery (<0.05) are strongly associated with high BMI, whereas religion(>0.05), area(rural/urban)(>0.05), anemia(>0.05), GDM(>0.05) postdated pregnancy(>0.05), induction of labour(>0.05) are not associated with high BMI. neonatal variable-neonatal complication(<0.05), perinatal mortality(<0.05) are strongly associated with high BMI, whereas according to baby weight (>0.05) is not associated with high BMI.

Conclusions: As the obstetrical outcome is significantly altered due to high BMI, we can improve maternal outcome by overcoming obesity. As obesity is a modifiable risk factor, preconception counselling creating awareness regarding health risk associated with obesity should be encouraged and obstetrical complications reduced.

INTRODUCTION

Obesity is a state of excess adipose tissue mass. Adipose mass increases by enlargement of adipose cells as well as by an increase in number of adipocytes¹. In recent times body mass index (BMI) is widely accepted as a better measure of overweight, obesity and underweight. World Health Organization (WHO) has defined the criteria of overweight as BMI>25 and that for obesity as>30².

WHO describes obesity as one of the most blatantly visible, yet most neglected, public health problems that threaten to overwhelm both more and less developed countries. Obesity is a major public health issue and as per WHO, it is a killer disease at par with HIV and malnutrition. Even in countries like India, significant proportion of overweight and obese coexists with the undernourished. Lifestyle modifications over the years have led to a more sedentary lifestyle. This is of global concern, as excess bodyweight is now the sixth important risk factor contributing to disease worldwide and increased level of obesity may result in a decline in life expectancy in the future^{3,4}. Obesity causes or exacerbates many health problems, both independently and in association with other diseases. It is associated with the development of type 2 diabetes, coronary heart disease, an increased incidence of certain forms of cancer, respiratory complications and osteoarthritis of large and small joints in later life.⁵ Increasing degrees of overweight and obesity are important predictors of longevity⁶. The outcome variables evaluated in study were rates of preeclampsia, gestational diabetes, caesarean delivery, failed induction, operative vaginal deliveries, birth weight, and postpartum infection.

The increasing prevalence of obesity in young women is a major public health concern and have a major impact on pregnancy outcomes in these women.

The rising rate of obesity is a major public health concern in the developing countries like India very few females come for preconception counseling so estimation of pre pregnancy weight record is not available. Women from rural area are not aware of their weights.⁷ so, considering this factors we decided to conduct this study as correlation of early pregnancy BMI with maternal and foetal outcome. BMI provides a reliable indicator of body fat for most people and is used to screen for weight categories that may lead to health problems.

METHODS

A comparative prospective study was conducted in the Department of Obstetrics and Gynaecology at dr. S. N. Medical College, Jodhpur (Rajasthan). Cases were taken from patients attending antenatal OPD were selected for this study. Two comparative groups of 50 females each were made. The control weight group comprised of 50 women having BMI of 18.5-24.99 kg/m². Similarly overweight group of 50 females having BMI ≥25 kg/m² having similar demographic profile were selected.

Inclusion criterion –

1. Singleton pregnancy
2. Patients with gestational age more than 28 weeks

Exclusion criterion

1. Multifetal gestation
2. Patient not giving consent

These patients attended ANC regularly in the Gynaecology and Obstetrics Department of MDM Hospital, Jodhpur and were studied till child birth and early puerperium.

- Women were counselled and assured that data collected would be kept confidential.
- A verbal consent was taken from patients before including her in the study.
- Gestational age was assessed by self reported last menstrual period.
- The height (in meters) of the study participants was recorded at the first antenatal visit while the weight (kg) was recorded at each visit.
- The measurement was used to calculate Quetelets index or the Body Mass Index (BMI) using the formula weight (kg)/(height in meters²).

RESULTS

In our study 50 overweight women were compare with 50 women with normal BMI for obstetric behavior and pregnancy outcome and statistically analyzed.

Table 1: Table no. 1 Socio-demographic characteristic of women in both groups

Characteristic	Control group	Overweight group	P value at p < 0.05
Age Group (yrs)			Significant
≤20	10	6	
21-30	38	32	
>30	2	12	
Parity			Significant
0	29	39	
1-3	17	11	
>3	4	0	
Religion			No Significant
Hindu	40	42	
Muslim	10	8	
Area			Significant
Rural	18	9	
Urban	32	41	

In our study 85.7% Overweight group compare to 14.28% in control group in >30 age group (yrs).

Table no. 2 Antenatal variables of women in both groups

Antenatal variables	Control group	Overweight group	P value at p < 0.05
Anemia			No
Severe (<7)	1	0	Significant
Mild to Moderate (7.1-11)	35	34	
Normal (>11)	14	16	
PIH			Significant
Present	1	10	
Absent	49	40	
Gestational Diabetes			No
Present	3	7	Significant
Absent	47	43	
Treatment for Infertility/ Sub fertility			Significant
Taken	3	12	
Not taken	47	38	

In our study all antepartum complications (PIH, infertility/sub fertility) are more with pregnant women with high BMI

In our study we found that the incidence of obese and overweight pregnant females was 8.2%. There was a preponderance of pregnancy at early age in normal weight group and elderly primi in overweight group. Parity >3 was more in normal weight group (8%) than overweight group (0%) indicating better fertility in normal weight group. There was no effect of religion on weight (p value 0.795). There were more cases in overweight group (24%) who were treated for infertility or subfertility compared to normal weight group (6%). More number of cases of overweight group are from urban areas (82%) compared to rural (18%) in overweight groups. This is due to life style of urban women with decreased physical activity and eating habits, all leading to weight gain.

Table no.3 Maternal outcome and parameters in both groups

Maternal outcome	Control group	Overweight group	P value at p < 0.05
Post dated pregnancy			No Significant
Present	4	9	
Absent	46	41	
Induction of labour			No Significant
Present	10	16	
Absent	40	34	
Mode of delivery			Significant
ND	38	9	
LSCS	11	36	

Instrumented	0	4	
ABD	1	1	
Type of caesarean			Significant
Elective	4	16	
Emergency	7	20	
Infection			Significant
Present	4	14	
Absent	46	36	
PPH			Significant
Present	2	10	
Absent	48	40	

In our study, 18% are normal deliveries; 72%, 8% and 2% pregnant women delivered by caesarean section, assisted instrumental and breech vaginal delivery. Rate of emergency caesarean section are higher, complication like PPH and wound infection also more.

Overweight women are more prone to develop antenatal complications in comparison to normal weight women. In our study the incidence of pre-eclampsia was also significantly higher in overweight women (20%) compared to normal weight group (2%). Similarly overweight women (14%) also had higher incidence of gestational diabetes mellitus in comparison to their normal weight (6%) counterparts in our study. Thus prenatal care in obese women required special care for early diagnosis and treatment of these complications. Overall weight gain (10kg) in pregnancy was less in overweight group (2%) compared to normal weight group (24%).

In our study we saw obesity poses a progressive adverse effect on the course of labour. The onset of spontaneous labour was less common in overweight women. This coupled with the increased incidence of gestational diabetes mellitus, PIH, post maturity led to higher incidence of induction of labour in overweight women (32%) compared to normal weight group (20%). In comparison with women of normal weight women (22%) had a progressive reduction in vaginal delivery rate and increased incidence of cesarean section in overweight women (72%). The incidence of PPH was also higher in overweight women (20%) in comparison to normal weight women (4%). Cesarean section wound infection rate was more in overweight group (33.3%) increasing the hospital stay and morbidity.

Table no. 4 Neonatal outcome in both groups

Neonatal outcome	Control group	Overweight group	P value at p < 0.05
Baby weight			No Significant
Normal	39	36	
LBW	10	11	
Macrosomia	1	3	
Neonatal complications			Significant
No complications	40	31	
Birth asphyxia	2	4	
ICH	0	1	
Septicemia/RDS/	5	6	
Others	3	8	
Perinatal Mortality			No Significant
No Mortality	49	48	
Early Neonatal Death/Still Born	1	2	

In our study neonatal complication are more with pregnant women with high BMI.

In our study low birth weight babies were more in overweight group (22%) compared to normal weight group (20%). Obstetrical outcome (foetal and maternal) was better in normal weight female as compared to overweight pregnant females. It is costly to treat overweight pregnant women in respect to antenatal, intranatal and postnatal care and morbidity is higher.

DISCUSSION

In the present study maximum number of patients in both groups belonged to age group 21-30 years (76% & 64%). Cases belonging to age group >30 were 2, in normal weight group and 12 in overweight group. Teenage pregnancies were more in normal weight group compared to overweight group ($p < 0.05$). Studies by Lumme et al⁸, Gross et al⁹ also showed similar results.

In the present study multiparity was more common in normal weight group. Majority of overweight group were primi (78%) and none of them were more than para 3 due to difficulty in getting pregnant ($p < 0.05$). These results are comparable to studies done by Lumme et al⁸ and Gross et al⁹.

In our study we see that in rural area more women (36%) have normal weight. In contrast to this urban population has more incidence of overweight women (82%). This difference is statistically significant ($p < 0.05$). This result is similar to study done by Adair LS et al¹⁰. There are more women with severe anemia (2%) in normal weight as compared to overweight (0%) women ($P > 0.05$). Study done by, Delhi Medical council¹¹, Bechurammondal et al¹² also show overall incidence of anemia during pregnancy was found to be 45.42%. We see that in the overweight group there are more number of patients who have conceived after taking treatment for infertility or subfertility (24%) in comparison to normal weight group (6%) ($P < 0.05$). There are studies done which shows that obesity is a risk factor for anovulation which may lead to sub fertility Norman and Clark¹³. Obesity is also associated with subfertility due to increased insulin resistance.

PIH was more common in overweight pregnant group than normal weight group. It was 20% in overweight group and 2% in normal weight group ($P < 0.05$). Studies done by Bhattacharya et al¹⁵, Raatikainen et al¹⁶ also show similar results. Gestational diabetes was higher (14%) in overweight group than in normal weight group (6%) ($P > 0.05$) this is probably because in our study normal weight and overweight pregnant patients were included and GDM is more common in obese pregnant patients. Study conducted by Sebire et al¹⁷ also showed increased incidence of GDM in overweight and obese pregnant women. Postdatism are more in overweight than normal weight group. In overweight it was 18% and 8% in normal weight group ($P > 0.05$). Studies done by Sarkar et al¹⁸, Khashan and Kenny et al¹⁹ show similar results.

Induction of labour was more commonly done in overweight pregnant patients (32%) in comparison to normal weight pregnant patients (20%) ($P > 0.05$). Study done by Ahmed SRet al²⁰ also show similar results.

There are 4 outlet forceps deliveries in overweight group while no such case in normal weight women group. Normal vaginal deliveries are 76% in normal weight group and 18% in overweight women group. LSCS rate was 72% in overweight females in comparison to only 22% in normal weight females ($p < 0.05$). Similar results were found in many other study like Sarkar et al¹⁸.

Infection rate after caesarean section is higher in overweight group (33.3%) in comparison to normal weight group (18.2%) ($p < 0.05$). Similar results were seen in many other studies like Sebire et al¹⁷ and Ahmed SR et al²⁰. This led to more dressings, increase hospital stay, wound gaping and resuturing in overweight group.

PPH was more common in overweight group than in normal weight group. It was in 20% cases of overweight group and 4% cases of normal weight group ($p < 0.05$). Studies done by Bhattacharya et al¹⁵ and Sebire et al¹⁷ also found similar results. The possible explanation could be increase chances of instrumental delivery causing vaginal laceration, atonicity of uterus.

78% babies were of normal weight in normal weight pregnant women while 72% babies have normal weight in overweight pregnant

women. Low birth babies percentage was 20% and 22% in normal weight group and overweight group respectively. There were three macrosomic babies in overweight group while 1 case seen in normal weight group. Both group macrosomic babies were born to gestational diabetes mellitus mothers ($p > 0.05$). Similar results were also found in many other study like Khashan and Kenny et al¹⁹.

2 perinatal death out of 50 newborn in overweight group and only one perinatal death in normal weight group ($p > 0.05$). Study done by Kristensen et al²¹ also showed that obesity more than double the risk of still birth and neonatal death.

In the light of data observed from our study, we conclude that overweight women had an elevated risk of wide variety of pregnancy, birth and neonatal complications in overweight and obese women during and after pregnancy. As the obesity epidemic also affects women of child-bearing age, it is of vital importance to address pre-pregnancy care and weight-management programme to prevent this increase and consequently reduce obesity among future generation. So obesity poses a major challenge for health provider for better utilization of maternal health care, especially for delivery and this will reduce adverse maternal and perinatal outcome.

CONCLUSION

Obesity is modifiable and preventable. Preconception counseling and awareness regarding exercise and healthy nutritious diet should be done. Pregnant women with high BMI is considered as high risk pregnancy. Maternal BMI shows strong associations with pregnancy complications and outcome. Both maternal and fetal complications are increased. Attempt should be made to prevent obesity in women of childbearing age and encourage weight loss to attain ideal weight before pregnancy.

It is beneficial to monitor overweight and obese women carefully, so as to intervene earlier if complications arise. Effort should be made to educate about obesity and appropriate weight gain in pregnancy, particularly for women with high pre-pregnancy BMI. Pre-pregnancy and early pregnancy dietary counseling of obese women should include education about appropriate intake of calories and nutrients to meet the needs of pregnant women and developing embryo.

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