



ORIGINAL RESEARCH PAPER

Gynaecology

EFFECT OF BODY MASS INDEX ON PREGNANCY OUTCOME

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ABSTRACT

Obesity is a worldwide problem. It has negative impact on health of the individual. Patients with obesity may also suffer from infertility and if they become pregnant there are increased risk of abortions and other complications. Obese patients with pregnancy are high risk patients and require extra care.

**Summary, Objective**—To estimate complication of pregnancy in women having Body mass index more than 30 as compared to women with body mass index less than 30.

**METHOD**- Total 200 women, 100 with body mass index >30 and 100 with BMI <30 were observed for one year.

**RESULTS**- In patients with Body Mass Index more than 30 complications of pregnancy –hypertension, diabetes mellitus, macrosomia, sudden intrauterine death were significantly more as compared with patients with normal body mass index. In obese patients operative and post operative or post natal complications were significantly more.

**CONCLUSION**- Study has shown clear association between Complications and increased maternal weight.

Obesity is a global health problem that is increasing in prevalence. The World Health Organization characterizes obesity as a pandemic issue, with a higher prevalence in females than males. (1) Maternal obesity increases the risk of complications in pregnancy and, as such, requires adjustment in antenatal care. To lose weight, you need to consume more **calories** than your intake. You can achieve this by getting regular exercise and eating healthy foods. Your obstetrician may refer you to a nutritionist to plan a healthy diet for you. In women Obesity has a significant impact on every aspect of female reproductive life in terms of infertility and early and late pregnancy complications as well as increased maternal and neonatal morbidity and mortality. Body mass index (BMI) is calculated by height and weight that applies to adult men and women. BMI is a useful measure of overweight and obesity. It gives an idea of Body fat.

**BMI Categories:**

- Underweight = <18.5
- Normal weight = 18.5–24.9
- Overweight = 25–29.9
- Obesity = BMI of 30 or more

The higher your BMI, the higher your risk for some diseases such as heart disease, high blood pressure, type 2 diabetes, gallstones, respiratory problems, and some of the cancers. Although BMI can be used for most men and women, it does have certain limits:

- It may overestimate body fat in athletes and others who have a muscular build.
- It may underestimate body fat in older persons and others who have lost muscle.
- Measuring waist circumference helps screen for possible health risks that come with overweight and obesity. If most of your fat is around your waist rather than at your hips, you're at a higher risk for heart disease and type 2 diabetes. This risk goes up with a waist size that is greater than 35 inches for women (Non Pregnant) or greater than 40 inches for men. To correctly measure your waist, stand and place a tape measure around your middle, just above your hipbones. Measure your waist just after you breathe out.

**Effect of Obesity on Pregnancy**—In present study we have studied 200 women-100 with BMI 30 or above and 100 with BMI below 30. Parity of patients was from nil to multipara. It is a multicentric study. Aim of study was to see effect of obesity on late pregnancy, delivery and postpartum. Many of our patients were unbooked. We have observed most of the complications were more in obese patients (BMI >30) as compared to women with normal BMI (<30).

**Complications**

Sr No	Complications	Women with normal wt.	Obese patients	Significance -p value
1-	Pregnancy induced Hypertention	12	39	.000012
2-	Diabetes Mellitus	12	33	.000377
3-	Macrosomia	05	18	.0039
4-	Low Birth Wt.	13	25	.0305
5-	Sudden IUD	09	22	.011

The reason obese pregnant women are more likely to end up with a cesarean delivery is that obese women are more likely to experience dysfunctional labor

Sr No	Procedure	Pt. with normal wt.	Obese Patients	Significance
1-	Vaginal Birth	77	43	.000001
2-	Caesarean Section	26	64	<.05
3-	Vaginal birth after Caesarean	78	31	<.05

Also complication during operative procedures are increased. The duration of Caesarean section in the obese is longer than in non-obese women. It can be more difficult in women with obesity to exteriorize the uterus to identify the angles to obtain haemostasis. Other technical problems are also encountered such as- transfer of the patient to operating tables (particularly if obese patient has already had an epidural anaesthesia) and the need for special operating tables in the obese patient. In addition to an increased rate of operative delivery, obese women are also at increased risk of intraoperative complications, such as- increased infectious morbidity and thromboembolic events. Some of the anesthetic complications are also there, such as failed intubation at the time of general endotracheal anesthesia. A number of specific recommendations have been proposed to lessen intraoperative complications in obese pregnant women. Recommendations Before, During, and After Surgery in Obese Pregnant Women are as follows-

- Consider preoperative **cardiac evaluation**, especially if the patient has diabetes or chronic hypertension. This should include a baseline electrocardiogram and, if abnormal, an echocardiogram and cardiology consultation.
- Give preoperative **broad-spectrum antibiotics** 20–30 minutes before the skin incision to reduce the risk of postpartum endometritis and wound infection.
- Consider using a **large operating table** (especially if the patient is < 300 lb) and having additional personnel in the delivery room.
- Because of the increased risk of intrapartum blood loss, consider having **additional blood products** available in the operating room.

- If indicated, **tape the pannus** out of the surgical field to facilitate visualization and avoid a through-and-through skin incision.
- **Close the subcutaneous layer.** There is extensive evidence that seroma formation and postoperative wound disruption can be decreased in obese women (defined as adipose layer < 2 cm) if the subcutaneous tissues are closed using layers of running sutures.
- **Avoid subcuticular skin closure** to allow serous fluids from the subcutaneous fat to drain out of the incision rather than accumulate in the subcutaneous layer.
- Place **pneumatic compression stockings** on the lower extremities of all obese parturients prior to and during surgery as prophylaxis against deep vein thrombosis (DVT).
- The compression stockings should remain in place until the patient is fully ambulatory. Additional prophylaxis against DVT with prophylactic low-molecular-weight heparin should be considered in women with a body mass index  $\geq 40$  kg/m<sup>2</sup>.
- Begin **early ambulation** to prevent DVT formation.
- Consider **delaying removal of staples or sutures** for a full week to allow the skin to heal completely.[2]

In addition to an increased rate of operative delivery, obese women are also at increased risk of intraoperative complications, including increased infectious morbidity and thromboembolic events (Table 1). There is also an increased risk of anesthetic complications, such as failed intubation at the time of general endotracheal anesthesia. A number of specific recommendations have been proposed to minimize intraoperative complications in obese pregnant women (summarized in Table 5). (2) Following Cesarean section delivery, obese women have a higher incidence of wound infection and disruption. Irrespective of the delivery mode, children born to obese mothers have a higher incidence of macrosomia and associated shoulder dystocia, which can be highly unpredictable.

Sr.No.	Normal Weight	Obese Women	Significance
Complications due to Anaesthesia	1	18	.00004
Thromboembolism	1	11	.0029
Wound Disruption	5	23	.000244

In addition to increased weight at birth, children born to obese mothers are found to be more susceptible to obesity in adolescence and adulthood. Prevention is the best way (1). The ultrasound should be repeated at term to check on the estimated fetal weight to rule out macrosomia. Obese pregnant women should be screened for gestational diabetes around 24 to 28 weeks. During the second half of pregnancy, obese patients should be closely watch for signs and symptoms of pregnancy-induced hypertension. During labor, an early anesthesia consultation is highly recommended irrespective of delivery mode. When Cesarean section is performed the incision should be decided by the surgeon. Peripartum, special attention is given to avoid thromboembolism by using compression stockings and early ambulation.(1)

**DISCUSSION—**

As we can see all complications are increased in women with obesity (BMI >30).

In present study as we can see higher incidence of pregnancy induced hypertension(39%) reported in obese patients as compared to normal patients(12%).In another study by Deepika Jain et al(6) reported Pregnancy induced hypertension in obese patients(33.33%) as compared to non obese patients (5.56%) [6]. Similarly other complications during pregnancy such as Diabetes Mellitus was more in obese patients (33% as compared to 12% in non obese).In other study by Meaghann A Leddy et al Diabetes was significantly increased in obese patients as compared to non-obese[2]

Significant increase risk for Macrosomia ,sudden intra uterine death and preterm babies was seen in present study.Similar results are reported in other studies also.[2,6,8] Maternal obesity is associated with abnormal fetal growth. Women who are obese

are less likely to have a pregnancy complicated by a small-for-gestational age infant or intrauterine growth restriction, but this protective effect appears to dissipate once the maternal BMI reaches the level of obesity (> 30 kg/m<sup>2</sup>). The major concern in obese pregnant women is fetal macrosomia (defined as an estimated fetal weight of greater than or equal to 4500 g), which appears to be increased 2- to 3-fold in obese parturients. In a meta-analysis, the prevalence rates of fetal macrosomia were 13.3% and 14.6% for obese and morbidly obese women, respectively, compared with 8.3% for the normal weight control group. In the United States, the mean birth weight between 1985 and 1998 increased from 3423 to 3431 g among whites and from 3217 to 3244 g among blacks. In Canada same time period shows, the mean birth weight increased from 3391 to 3427. In Denmark, the mean birth weight reported between 1990 and 1999 increased from 3474 g to 3519 g (an increase of 45 g) and macrosomia rates increased from 16.7% to 20%. During a similar time period (1992–2001) in Sweden, there was a 3% increase in the incidence of large-for-gestational-age newborns (defined as birth weight > 2 standard deviations from the mean for a given gestational age). Although a number of factors may explain this global increase in the prevalence of fetal macrosomia, the prevailing data suggest that maternal obesity is the main factor.

**CONCLUSION:** Recommended weight gain during pregnancy—

BODY MASS INDEX	WEIGHT GAIN
18.5 to 24.9 kg/m <sup>2</sup> (normal weight)	25-35 lb(11.2-15.9kg)
25 to 29.9 kg/m <sup>2</sup> (overweight)	15 -25lb(6.8-11.2 kg)
More than 30 kg/m <sup>2</sup> ( Obese )	15lb(6.8kg)

The effects of gestational weight gain on pregnancy outcome depend on the woman's pre-pregnancy BMI. Pregnancy weight gains of 6.7-11.2 kg (15-25 lb) in overweight and obese women, and less than 6.7 kg (15 lb) in morbidly obese women are associated with a reduction in the risk of adverse outcome.(6) - The study has shown clear association between body mass index and complications during pregnancy ,delivery and postpartum. Multidisciplinary approach is needed in these patients.These patients should be identified before pregnancy and should be cancelled and taught regarding complications that can be arise during pregnancy and they should be properly guided to prevent complications.

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