

Impact of Obesity on Pregnancy and Labor

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Abstract: Background: Obesity has become an epidemic throughout the world. Worldwide, obesity rates have doubled in the last 30 years, with rates also increasing among pregnant women (**World Health Organization, 2011**). **Objective:** The aim of the present study was to determine the impact of obesity on pregnancy in antepartum and intrapartum care, maternal morbidity and mortality, obstetrical anaesthesia, and perinatal morbidity and mortality and effect of obesity on neonate outcome. **Material and Methods:** This prospective study was conducted at Bab El-Sharea University Hospital outpatient and in-patient unit who attended the ante natal care and paper word room between January 2015 and December 2015. 80 women participated in the study. The patients were classified into two groups: **Group I:** study group on 40 cases. **Group II:** control group on 40 case. Patients in the study group were nulliparous women who attending ante natal care clinic with body mass index >35 . **Results:** A total of 80 women participated in the study, whose age ranged between 20-40 years 75% of our cases were under 30 years old and 25% were over 30 years old. Gestational hypertension 40 % of obese 15% of normal weight group. Gestational diabetes mellitus was 27.5% of obese 15% of the normal weight group. The macrosomic babies 25% in obese and 10.0% in normal group. IUGR in obese group (15%) and (5%) in the normal weight group. Cesarean section in obese women 57.5% compared to normal weight 25%. wound infection in obese 12.5% compared to normal weight 5%. IUFD 5% in obese compared to 0% of normal. **Conclusion:** The primary objective in the management of obesity during pregnancy was prevention. Having obese women lose weight with lifestyle changes and achieve a normal BMI before conception were the ideal goal, but realistically it was quite difficult to achieve. [Yehia Abd- Elsalam Wafa, Abd-Elrahman Mustafa Anbar and Mohamed Ahmed Abd-Elaziz Adm. **Impact of Obesity on Pregnancy and Labor.** *Nat Sci* 2017;15(3):8-11]. ISSN 1545-0740 (print); ISSN 2375-7167 (online). <http://www.sciencepub.net/nature>. 2. doi:[10.7537/marsnsj150317.02](https://doi.org/10.7537/marsnsj150317.02).

Key words: Obesity, Antepartum, Intrapartum.

1. Introduction

Obesity has become an epidemic throughout the world. Worldwide, obesity rates have doubled in the last 30 years, with rates also increasing among pregnant women (**World Health Organization, 2011**).

Obesity is also associated with a higher risk of adverse neonatal outcomes, including stillbirth, congenital anomalies, neonatal intensive care admission, and neonatal death (**Dodd et al., 2011**). Furthermore, long-term studies demonstrate that having an obese mother increases the risk of a child growing up to be obese themselves (**Deierlein et al., 2011**). The impact that obesity in pregnancy has on the long-term health of society as a whole, is therefore immeasurable. Several UK studies have looked at adverse pregnancy in relation to obesity (**Kerrigan et al., 2010**). Some of the proposed mechanisms of the negative effects of obesity on pregnancy outcomes include hyperglycemia, nutritional deficiencies (reduced folate levels), hypertension, decreased sensitivity of ultra-sonography, and decreased ability to perceive a decrease in fetal movement. This remains a very active area of investigation. These negative reproductive outcomes associated with obesity are known to be reversible. Weight loss has

been shown to decrease miscarriage rates in obese women. The impact of obesity on health has received much attention in literatures over the past few years, but this problem in women of childbearing age raises specific difficulties (**Statistics Canada, 2010**).

It was thought that maternal obesity had a substantial impact on service provision and delivery due to the associated complications experienced by both mother and infant. There also was concern about the potential psychological impact of maternal obesity. A lack of awareness of this problem's potential risks among parents and the need for sensitive communication of such information by maternity staff makes tackling this important issue all the more difficult (**Lewis, 2007**).

Obesity and its associated health disorders and costs are increasing (**Browna et al., 2010**). According to World Health Organization (WHO) guidelines, normal weight is defined as a body mass index (BMI) of 18.5–24.9 kg/m², overweight as a BMI of 25–29.9 kg/m², and obesity as a BMI of 30 kg/m² or more. Obesity then can be further categorized by BMI into class 1 (30–34.9 kg/m²), class 2 (35–39.9 kg/m²), and class 3 (>40 kg/m²), also described as morbid obesity (**World Health Organization, 2000**).

The aim of the present study was to determine the impact of obesity on pregnancy in antepartum and intrapartum care, maternal morbidity and mortality, obstetrical anaesthesia, and perinatal morbidity and mortality and effect of obesity on neonate outcome.

2. Patients and Methods

This prospective study was conducted at Bab El-Sharea university hospital outpatient and in-patient unit who attending ante natal care and paper word room between January 2015 and December 2015, the patients were classified into two groups: **Group I:** study group. and **Group II:** control group. Group I included morbidly obese women (BMI > 35) and Group II included women with a normal BMI (18.5–25), Hospital charts for these women were reviewed.

Inclusion criteria:

1. Women over 37 week's gestation.
2. Pregnancy of singleton viable cephalic fetus.
3. Age ranged between 20 – 40 years.
4. Their weights prior to 8 weeks gestation were known; either through her weight previously documented in her follow up card or from the patient's own words and recall with their Pregestational BMI is either in the normal weight group (BMI = 18.5 – 24.9 kg/m²) or overweight group (BMI = 25 – 29.9 kg/m²) or obese group (BMI = 30 – 40 kg/m²).

Exclusion criteria:

1. Pregnant women less than 37 weeks gestation.
2. Age under 20 years or over 40 years.
3. BMIs are not within the previously mentioned parameters or didn't know their Pregestational weight.
4. History of medical diseases as chronic hypertension or chronic diabetes.
5. Cesarean section due to fetal distress or malpresentation.

Eighty pregnant women were included in the study. They were divided into 2 groups:

- 1) **Group A:** overweight (BMI = 25 – 29.9 kg/m²) and obese (BMI = 30 – 40 kg/m²).
- 2) **Group B:** Normal weight (BMI = 18.5 – 24.9 kg/m²).

Statistical Methods

The data were coded, entered and processed on an IBM-PC compatible computer using statistical package for social sciences (SPSS) version 17. Data were statistically described in terms of frequencies (number of cases) and relative frequencies (percentages). Comparison of variables between the study groups was done using Chi square (χ^2) test. Exact test was used instead when the expected frequency was less than 5. A probability value (p value) less than 0.05 was considered statistically significant. Full history taking, general and local examinations, full investigations, and U/S on all cases.

3. Results

A total of 80 women participated in the study, whose age ranged between 20-40 years 75% of our cases were under 30 years old and 25% were over 30 years old. These patients were divided into 2 groups: Group A/ overweight (BMI = 20 – 24.9 kg/m²) and obese (BMI = 30 – 40 kg/m²). Group B/Normal weight (BMI = 18.5 – 24.9 kg/m²).

Table (1): Demographic characteristics of pregnant women in this study

Characteristics	Percentage (%)
BMI	
20-24.9 kg\m ²	50%
25-40 kg\m ²	50%
Age group	
20-30 years	75%
30-40 years	25%
Parity	
Primigravida	100%
Education	100%

Table (2) Incidence and statistical significance of different groups.

	Obese/Over Weight Group	Normal Group	P value
Gestational Hypertension	40.0%	15%	0.012
Gestational Diabetes	35%	15%	0.039
Macrosomia	25%	10.0%	0.05
IUGR	15%	5%	0.228
Cesarean Section	57.5%	25%	0.090
Apgar Score at 1 st minute	2.5%	0%	0.228
Apgar Score at 5 th minute	5%	0%	0.554
IUFD	5%	0%	0.554

The overall percentage of women who had gestational hypertension in pregnancy was 27.5%, yet the overweight/ obese group had the upper hand. 40% of obese women compared to 15% of the normal weight group were affected (almost a 3 fold increase; statistically significant results).

Regarding gestational diabetes mellitus, it was eminent in the obese/ overweight group compared to the normal weight group 25% of women in our study had gestational diabetes, 35% (in obese/ overweight group) compared to 15% (in normal weight group). The average neonatal birth weight was 3483 grams. The macrosomic babies accounted for 17.5% in both groups (normal and obese/ overweight); 25% in obese/ overweight group and 10.0% in normal weight group (not statistically significant).

IUGR affected 10% of our 80 women in our research, 6 cases in the obese/ overweight group were found (15%) and only 2 (5%) in the normal weight group (not statistically significant).

A total of 41.2% of women performed a Cesarean section. Women with (BMI 18.5-24.9 kg/m²) performed less C.S, (25%), whereas the obese/ overweight group had almost 2 times the incidence of the normal group (57.5%). Although many cases performed cesarean sections, yet the results were statistically significant. In contrast to the increased incidence of cesarean section performed in obese/ overweight women, wound infection was not statistically significant. Seven cases were affected (8.7%); five in obese/ overweight group (12.5 %) and two in normal weight group (5%) (not statistically significant).

Also IUFD was not significant in obese/ overweight women; 2 cases in obese/ overweight group (5%) and no cases in normal weight group were found.

4. Discussion

The prevalence of overweight or obesity in adults aged older than 20 years was 65.0%, and the prevalence of obesity was 30.0% (**Yogevand catalane., 2009**). regarding other studies A strong association between increasing BMI and pregnancy induced hypertension was found; a meta-analysis of the risk of pre-eclampsia associated with maternal BMI showed that the risk of pre-eclampsia doubled with each 5 to 7 Kg/m² increase in pre-pregnancy BMI. Also found a 3 times higher risk of pre-eclampsia in obese (BMI 30 to 39.9 Kg/m²) primigravida women was found (**Brook et al., 2001**).

The systemic review of O'Brien demonstrated a consistently strong positive association between maternal pre- pregnancy BMI and the risk of pre-eclampsia (**O'Brien et al., 2003**).

Our results agree with the previous studies which have shown an association between increasing BMI and hypertension. We also found a 3 folds increase in obese group than normal weight group (40.0% in obese group and 15% in normal weight group). Regarding gestational diabetes Linen study showed that Approximately 6% of normal weight women, compared to 17% of obese women develop gestational diabetes mellitus during pregnancy (**Linne et al., 2004**).

Our study goes hand in hand with the previous study as we found increased BMI increases the risk of developing gestational diabetes; about 2 folds increase in obese than normal weight group (35% in obese group and 15% in normal weight group).

With regard to intrauterine growth retardation measured by the fetal birth weight the risk of low birth weight (birth weight less than 2,500g) was lower in obese women, while macrosomia (birth weight more than 4,000g) was much more common in the obese (**Cedergren, 2004**).

Our study showed no statistical significance in risk of developing low birth weight fetuses in obese group compared to normal weight group although 6 patients in obese group were having low birth weight fetuses compared to 2 patients in normal weight group (15% in obese group and 5% in normal weight group). Several studies investigating the relationship of maternal obesity with fetal growth have shown that obese women have an 18 – 26% increased chance of delivering large for date infants, even after controlling maternal diabetes (**Catalano, 2007**). The study of Cedergren also supports this; however after excluding women with pre – eclampsia, this increased risk was no longer statistically significant (**Cedergren, 2004**).

Reported significant increase in neonatal fat mass in birth weights of infants born to women with gestational diabetes mellitus (**Catalano, 2007**). The strongest predictor of fat mass in infants of women with gestational diabetes mellitus was found to be maternal fasting glucose levels (25-40%). This neonatal obesity is proposed to be a significant risk factor for adolescent/adult obesity (**Anadyr and Lorraine, 2005**). In our study, 23 patients out of 40 patients in the obese group (57.5 %) compared to 10 patients out of 40 patients in normal weight group (25%) performed cesarean section. Although the rates of performed cesarean sections in obese women were high, yet these results failed to show statistical significance. There has been an increasing awareness in the past decade of the role of maternal obesity in the risk of unexplained antepartum fetal death. In a Canadian population, researchers examined the factors related to 196 unexplained fetal deaths, (25% of the fetal deaths in their population). (**Huang et al., 2000**). In our study 2 cases of IUFD were found in the obese

group versus no cases in the normal weight group. Secondly, our study used data collected over 7 months; a short duration which should be extended in later studies and researches to show the longstanding impact of obesity on the patient.

Hendler *et al.* suggest that all pregnancies in obese women be acknowledged as high risk and managed according to strict guidelines. Management should include pre-pregnancy counseling to reduce weight; shared antenatal care and appropriate management of complications. The evidence for obesity as an important complication in pregnancy is mounting; it is time to inform practice based on this evidence (**Hendler *et al.*, 2005**).

Conclusion:

The primary objective in the management of obesity during pregnancy is prevention. Having obese women lose weight with lifestyle changes and achieve a normal BMI before conception would be the ideal goal, but realistically it is quite difficult to achieve. Once an obese woman does conceive, management should be directed at increased surveillance for these risks:

1. In early gestation, the risks of spontaneous abortion and congenital anomalies.
2. In later gestation, gestational hypertension and diabetes-related problems, macrosomia, as well as the increased risk of unexplained stillbirths.
3. At parturition, the increased risk of cesarean delivery and attendant complications of anesthesia, wound disruption, infection, and deep vein thrombosis.

References

1. Anadir and Lorraine, {2005}. Maternal obesity, gestational diabetes,;366:204.
2. Brown LM, Gent L, Davis K and Clegg DJ. {2010} Metabolic impact of sex hormones on obesity. Brain Research, 1350:77-85.
3. Catalano PM. {2007} Management of obesity in pregnancy. Obstet Gynecol, 109(2 pt 1):419–33.
4. Cedergren MI. {2004} Maternal morbid obesity and the risk of adverse pregnancy outcome. Obstet Gynecol 103:219–24.
5. Deierlein A, Siega-Riz AM, Adair LS and Herring AH. {2011} Effects of prepregnancy body mass index and gestational weight gain on infant anthropometric outcomes. The Journal of Pediatrics, 158: 221–6.
6. Dodd JM, Grivell RM, Nguyen AM, Chan A and Robinson JS. {2011} Maternal and perinatal health outcomes by body mass index category. Australian and New Zealand Journal of Obstetrics and Gynaecology, 51(2):136-40.
7. Hendler I, Blackwell SC, {2005} Bujold E, Treadwell MC, Mittal P, Sokol RJ, et al. Suboptimal second-trimester ultrasono-graphic visualization of the fetal heart in obese women: should we repeat the examination? J Ultrasound Med, 24:1205–9.
8. Kerrigan AM and Kingdon C. {2010} Maternal obesity and pregnancy: aretrospective study. Midwifery 26:138–4.
9. Lewis G. {2007} The confidential enquiry into maternal and child health (CEMACH). Saving mothers' lives: reviewing maternal deaths to make motherhood safer—2003—2005. The Seventh Report on Confidential Enquiries into Maternal Deaths in the United Kingdom. London: CEMACH.
10. O'Brien T E, Ray JG and Chan WS. {2003} Maternal body mass index and the risk of pre-eclampsia: a systematic review. Epidemiology 14: 368-374.
11. Statistics Canada, {2010}.: Adult obesity in Canada: measured height and weight. Available at: 8060-eng.htm. Accessed January 6, survey of outcome of pregnancy in women with Pregestational.
12. World Health Organization {2011} Department of Reproductive Health and Research. WHO guidelines for the management of postpartum haemorrhage and retained placenta. Geneva.
13. World Health Organization, {2000}. Obesity: preventing and managing the global epidemic. Report of the WHO Consultation on obesity, Geneva.
14. Yogev Y and Catalano PM. {2009} Pregnancy and obesity. Obstet Gynecol Clin N Am 6: 285–300.

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