

## Original Article

## IMPACT OF OBESITY ON OBSTETRICAL PRACTICE AND OUTCOME

Farhatulain Ahmed, Attiqia Amin, Shumaila Yasir and Noor-i-Kiran Naeem

**Objective:** To find out the complications occurring during pregnancy, delivery and in post partum period in obese and non-obese pregnant women.

**Material & Methods:** This cross sectional study was conducted in Department of Gynaecology and Obstetrics, Fatima Memorial Hospital, Lahore. Sixty pregnant females with singleton pregnancy were selected. Women with BMI>30 were taken as obese and those less than 30 were taken as non-obese. Complications like gestational diabetes, hypertension, induction of labour, delay in second stage of labour, instrumental vaginal deliveries or operative deliveries, third or fourth degree perineal tear, wound infection and thromboembolism were assessed in all patients.

**Results:** The mean age in group A was 25.0 ± 2.9 years and in group B was 25.0±2.7 years. The complications during pregnancy were as follows: gestational diabetes and gestational hypertension were found in 6 (20%) and 14 (44.7%) in group A while 3 (10%) and 1(3.3%) in group B respectively. 16 (53.3%) patient had induction of labour in group A and 8 (26.7%) in group B. In group A only 8 (26.7%) patients had spontaneous vaginal delivery (SVD), 7 (23.3%) patients delivered by instrumental vaginal deliveries and 15 (50%) patients underwent Caesarean section. In group B, 18 (60%) were delivered by SVD, 4 (13.3%) had instrumental vaginal delivery and 8 (26.7%) had caesarean section. Third degree perineal tears occurred in 6 patients from group A and 5 patients from group B. Fourth degree perineal tears occurred in four patients only from group A. During postpartum period seven patients from group A and two patients from group B had wound infections. One patient from group A had thromboembolism.

**Conclusion:** Obese pregnant patients have more complications during pregnancy, delivery and postpartum period than non-obese pregnant women.

**Key Words:** Obese, Non-obese, Complications, Body mass index and pregnancy.

### Introduction

Obesity is often declared simply as a condition of abnormal or excessive fat accumulation in adipose tissue to the extent that health may be impaired.<sup>1</sup> Evidence is now emerging to suggest that the prevalence of overweight and obesity is increasing worldwide at an alarming rate. The prevalence is seen to be higher in industrialized countries than developing ones.<sup>2</sup> The prevalence of obesity among older people in industrialized countries range from 15 to 20 %.<sup>3</sup> The prevalence of obesity amongst children and adolescents of 2-19 years was 17.1% while in adults was 32.2% in USA. Similar increase has been seen in Great Britain between 1980 and 2008.

In Pakistan and India, obesity occurs in 10-28% of population and is more common in females and upper socioeconomic class. There is increased risk of NIDDM, hypertension, gall bladder disease, dyslipidemia, insulin resistance, sleep apnea and metabolic syndrome in obese people.<sup>4-6</sup> The risk of congenital heart disease and osteoarthritis are moderately increased as well as risk of certain

cancers, reproductive abnormalities and low back pain.<sup>7</sup> In addition to physical health problems related to obesity, there are numerous psychological and psychosocial effects.<sup>8</sup>

The complications of obesity in pregnancy generally relate to pre-gravid weight rather than gestational weight gain.<sup>9</sup> Based on the institute of medical guidelines recommend weight gain in pregnancy for normal weight is 25-35 lbs, 15-25 lbs for overweight, and 15 lbs for obese women.<sup>10</sup>

Approximately 1-3% of women, as compared to 7% of obese females develop gestational diabetes during pregnancy. Therefore it is pertinent to identify women at risk of gestational diabetes, hence this increases the risk of macrosomia.<sup>11</sup> There is a strong positive association between the maternal pre-pregnancy BMI and the occurrence of pre-eclampsia.<sup>12</sup> Obesity has been shown to have a casual association with sleep apnea and asthma.<sup>13</sup>

Maternal obesity is an independent risk factor for Caesarean sections.<sup>14</sup> The Caesarean section rate for obese women is over 20% compared to 10% in non-obese population. The obese females are more likely

first stage of labour, meconium stained amniotic fluid, mal-presentations, difficulty in placement of epidural or spinal anaesthesia. Additionally general anaesthesia carries a risk of difficult intubation. There is also increased rate of postoperative complications like wound infection, break down, postpartum endometritis and deep vein thrombosis.<sup>15</sup> Fetal risks include prematurity, fetal over growth and developing obesity later in life.

Most of these data related to pregnancy and obesity are from the developed countries. The present study was conducted to find out prevalence of various pregnancy related complications in obese and to compare these with non-obese females in our set up.

### Material & Methods

This cross sectional analytical study was conducted in the department of Obstetrics and Gynaecology, Fatima Memorial Hospital, Lahore. Sixty pregnant female women were enrolled in this study during six months period from April 2007 to September 2007 after obtaining informed consent. Women with intrauterine fetal demise or congenitally abnormal fetus, any medical disorder prior to conception and previous history of abdominal delivery were excluded.

Weight and height of these women were recorded at enrollment. Their BMI was calculated using standard formula, by dividing weight in kilograms by height in meters<sup>2</sup>. These women were divided into 2

groups on the basis of BMI. Group A included 30 pregnant women with BMI >30 and group B also had 30 women with BMI less than 30.

Detailed demographic data, general physical examination and routine laboratory investigations were done. These women were followed up as outpatient and then during hospitalization closely and were observed for occurrence of complications like gestational hypertension, and gestational diabetes. Mode of delivery whether spontaneous or with intervention and complications during labour were recorded. They were also observed for complications like wound infection and thromboembolism during postpartum period.

### Results

The mean age of patients in the study was 25.31±2.9 years with mean BMI of 35.1±2.4 Kg/sq.m in group A and 25±2.7 years and 24± 2.2 kg/sq.m in group B respectively.

Gestational diabetes was found in 20% of patients in group A and 3.3% in group B, where as hypertension was found in 46.7 % patients in group A and 10% in group B. Labour was induced in more patients in group A as compared to group B as shown in **Table I**. Higher number of patients in group A had instrumental vaginal delivery and low segment Cesarean section compared to group B as depicted in **table II**. Third and fourth degree perineal tears occurred more often in group A than group B as

**Table-1:** Distribution according to complications of pregnancy.

Complication	Group A		Group B		p Value
	No.	Percentage	No.	Percentage	
Gestational Hypertension	14	46.7	03	10	0.001
Gestational Diabetes	6	20	01	3.3	0.01
Induction of Labour	16	53.3	08	26.7	0.01

**Table-2:** Distribution by mode of delivery.

Mode of delivery	Group A		Group B		p Value
	No.	Percentage	No.	Percentage	
SVD	08	26.7	18	60	0.01
Instrumental vaginal delivery	07	23.3	04	13.3	0.05
LSCS	15	50	08	26.7	0.01

**Table-3:** Distribution by 3rd degree perineal tears.

	Group A		Group B		p Value
	No.	Percentage	No.	Percentage	
Yes	06	20.0	05	16.7	
No	24	80.0	25	83.3	0.2

**Table-4:** Distribution by 4th degree perineal tears.

	Group A		Group B	
	No.	Percentage	No.	Percentage
Yes	03	10.0	0	0
No	27	90.0	30	100

*p=0.03*

**Table-5:** Distribution by Postpartum complications.

BMI	Group A		Group B	
	No.	Percentage	No.	Percentage
Wound Infection	07	23.3	02	6.7
Thromboembolism	01	3.3	0	0

*p=0.008*

shown in **table III and IV**. Complications during postpartum period are depicted in **table V**. In group A seven patients had wound infection and 1 patient had thromboembolism. While in group B, 2 patients developed wound infection and no patient had thromboembolism.

### Discussion

Prevalence of obesity is rising to epidemic proportions around the world and 33% of adults in US are obese whereas in Pakistan and India obesity occurs in 10-20% of population and is more common in females.<sup>17</sup> Maternal obesity poses a significant risk to maternal and fetal health during pregnancy and our study confirms the findings that obesity is associated with significant complications including gestational diabetes, pregnancy induced hypertension and caesarean section. In this study, the mean age of patients was 25.31±2.9 years with BMI 35.1±2.4 kg/sq.m in group A and 25±2.7 years and 24 ± 2.2 kg/sq.m in group B respectively which is comparable to study by Dension et al.<sup>18</sup> Gestational diabetes was found in 20% of patients in group A and 3.3% in group B which is comparable with study of Grossett et al<sup>19</sup> where gestational diabetes was 1.8% in non-obese group and 15% of obese group. Induction of labour was achieved in 53.3% patients in group A and similar to the study of Mazhar et al<sup>20</sup> where induction of labour was done in 55% of women. In another study by Michlin et al,<sup>21</sup> induction of labour was achieved in 10.2% in non-obese group and 20.4% in obese group which is less than our study. This difference may be due to their large sample size.

Regarding mode of delivery significantly higher number of patients had intervention in group A i.e 53 % LSCS, and 23.3 % instrumental vaginal delivery as compared to group B where LSCS was done in

26.7 % and instrumental vaginal delivery in 13.3 %. A study published by Ruomero et al<sup>22</sup> showed that 62.6% women were delivered by SVD and 37.4% had LSCS in non-obese as against obese group where 51.2% had SVD and 45.81% had LSCS. In group A 3.3% of obese females had DVT and 23.3% had wound infection whereas in group B 6.7% had wound infection, comparable to study by Yu et al.<sup>23</sup> Obesity is now the most common clinical risk factor in obstetric practice and is escalating with the rise in obese teenagers reaching reproductive age. Many studies have demonstrated the risk that obesity poses on pregnancy outcome. However there is currently paucity of interventional studies on obese women who have attempted to modify risk and improve pregnancy outcome. Antenatal care should be individualized in obese women and delivered by a multi-disciplinary team to reduce risk and improve fetomaternal outcome.

### Managing obesity in pregnancy:

#### Preconception counseling:

More women (21%) are obese compared to men (17%), having greater health and socioeconomic implications. Stringent anti-obesity measures need to be implemented in women, due to detrimental effect of obesity on pregnancy and transgenerational outcomes. In particular, obesity prevention/treatment strategies need to be targeted in childhood to prevent complications of obesity in the reproductive years.

Nutritional education, behavioural modifications, drug treatment and dieting have not been successful in reducing weight in obese adults.

#### Optimal weight gain in obese pregnant females:

Gestational weight gain greater than that recommended by the institute of medicine is

birth weight (>4.5kg) did not increase significantly until pregnancy weight gain exceeds the upper limit of Institute of Medicine range (16 kg).<sup>24</sup> It is not recommended that these women lose weight in pregnancy due to increased risk of ketosis. However, interventions in early pregnancy for obese and overweight women, to keep weight gain within the recommended limits during pregnancy, may reduce incidence of complications associated with

pregnancy.<sup>25</sup> Patient compliance is higher during early pregnancy as results from smoking campaigns suggest that the women are more motivated at this point.

*Department of Obstetrics and Gynaecology,  
Fatima Memorial Hospital, Lahore.  
[thesculapio@hotmail.com](mailto:thesculapio@hotmail.com)  
[www.sims.edu.pk/esculapio.html](http://www.sims.edu.pk/esculapio.html)*

## References

1. Bray GA. Definition, measurement and classification of the syndromes of obesity. *Int J Obes* 1978; 2:99-112.
2. Luke A, Durazo-Arvizu RA, Rotimi CN, Schoeller DA, Adeyemo AA et al. Activity energy expenditure and adiposity among black adults in Nigeria and the United States. *Am J Clin Nutr* 2002;75:1045-50.
3. Kaplan MS, Huguot N, Newsom JT, McFarland BH, Lindsay J. Prevalence and correlates of overweight and obesity among older adults: findings from the Canadian national population health survey. *J Gerontol A Biol Sci Med Sci* 2003; 58:1018-30.
4. Randhi G, Franceschi S, LaVecchia C. Gallbladder cancer worldwide: geographical distribution and risk factors. *Int J Cancer* 2006;118:1591-602.
5. Jafar TH, Chaturverdi N, Pappas G. Prevalence of overweight and obesity & their association with hypertension & diabetes mellitus in an Indo-Asian population. *CMAJ* 2006;175: 107:1-7.
6. Haq F, Rizvi J. Infertility and polycystic ovarian syndrome: a study of association between body mass index and intrafamily marriages. *Gynecol Obstet Invest* 2008;65:269-74.
7. Farooqi A, Gibson T. Prevalence of the major rheumatic disorders in the adult population of north Pakistan. *Br J Rheumatol* 1998; 37:491-5.
8. Bean MK, Stewart K, Olbrisch ME. Obesity in America; implications for clinical and health psychologists. *J Clin Psychol Med Settings* 2008;15:214-24.
9. Johnson TS, Rottier KJ, Luellwitz A, Kirby RS. Maternal pre-pregnancy body mass index and delivery of a preterm infant in Missouri 1998-2000. *Public Health Nurs* 2009;26:3-13.
10. National Research Council. *Weight Gain during Pregnancy: Re-examining the Guidelines*. Washington, DC: The National Academies Press, 2009.
11. Ehrenberg HM, Mercer BM, Catalano PM. The influence of obesity and diabetes on the prevalence of macrosomia. *Am J Obstet Gynecol* 2004;191:964-8.
12. Bodnar LM, Ness RB, Morkovic N, Roberts JM. The risk of preeclampsia rises with increasing pre-pregnancy body mass index. *Ann Epidemiol* 2005;15:475-82.
13. Verdaguer M, Levrat V, Lamour C, Paquerreau J, Neau JP, Meurice JC. Obstructive sleep apnea syndrome (OSAS) in women: a specific entity? *Rev Mal Respir* 2008; 25:1279-88.
14. Moynihan AT, Hehir MP, Glavey SV, Smith TJ, Morrison JJ. Inhibitory effect of leptin on human uterine contractility in vitro. *Am J Obstet Gynecol* 2006; 195: 504-9.
15. Tipton AM, Cohen SA, Chelmow D. Wound infection in the obese pregnant woman. *Semin Perinatol*. 2011 Dec;35 (6):345-9.
16. Dietz PM, Callaghan WM, Cogswell ME, Morrow, Ferre C, Schieve LA. Combined effects of pre-pregnancy body mass index and weight gain during pregnancy on the risk of preterm delivery. *Epidemiol* 2006;17:170-9.
17. Khurram M, Paracha SJ, Khar H, Hasan Z. Obesity related complications in 100 obese subjects and their age matched controls. *J Pak Med Assoc* 2006;56:50-3.
18. Dension FC, Prince J, Graham C, Wild S, Liston WA. Maternal obesity, length of gestation, risk of postdates pregnancy and spontaneous onset of labour at term. *BJOJ* 2008;115:720-5.
19. Grossetti E, Beucher G, Regeasse A, amendour N, Herlicoviez M, Drefus M. Obstetrical complications of morbid obesity. *J Gynecol Obstet Biol Reprod (Paris)* 2004; 33:739-44.
20. Mazhar SB, Rahim F, Furukh T. Fetomaternal outcome in triplet pregnancy. *J Coll Physicians Surg Pak* 2008;18:217-21.
21. Michilin R, Qettinger M, Odeh M, Khoury S, Ophir E, Barak M et al. Maternal obesity & pregnancy outcome. *Isr Med Assoc J* 2000; 2: 10-3.
22. Romero-Gutierrez G, Urbina-Ortiz FJ, Ponce de Leon AL, Amanor N. Maternal and fetal morbidity in obese pregnant women. *Ginecol Obstet Mex* 2006;74:483-7.
23. Yu CK, Teou TG, Robinson S. Obesity in pregnancy. *BJOG* 2006;113:11.
24. Abrams B, Altman S, Pickett KE. Pregnancy weight gain still controversial. *Am J Clin Nutr* 2000;71:12335-415.
25. Olafsdottir AS, Skuladdtir GV, Thorsdottir I. Maternal diet in early and late pregnancy in relation to weight gain. *Int J Obes (Lond)*