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## BARIATRIC SURGERY (LAPAROSCOPIC SLEEVE GASTRECTOMY) AND PREGNANCY OUTCOME IN BASRA CITY

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### ABSTRACT

**Objective:**The purpose of this study is reviewing the effect of Laparoscopic sleeve gastrectomy on pregnancy outcome.**Methodology:**It is prospective case-control study from first of January 2018 to the first of June 2020 at Basra maternity and children hospital. The study was carried to analyze effect of Laparoscopic sleeve gastrectomy on maternal as well as fetal outcome. A total of 184 women, 64 with Laparoscopic sleeve gastrectomy with BMI 18-30 kg/m<sup>2</sup>, compared with 120 obese women who are BMI >30 kg/m<sup>2</sup> with no medical or obstetrical complications.**Results:**During comparison between pregnant women post Laparoscopic sleeve gastrectomy (group 1) and obese pregnant women without any bariatric surgery (group 2 control group) regarding maternal complications ,we found that the rate of DM was significantly lower in women with Laparoscopic sleeve gastrectomy (group 1) (6.25 %) when compared to women affected by obesity (control group) (17.1%) (P =0.01), but the rate of anemia (32.8%) and cesarean section (50%) were increase comparing to control group (9.1%) (25.1%) respectively (P=0.01). There are no statistically differences between two groups regarding hypertension, antepartum, postpartum hemorrhage, abortion and normal vaginal delivery. Regarding fetal complications, we found that the rate of small for gestational age babies (57.8%) and low apgar score in 5 minutes (17.1%) were significantly higher in women with Laparoscopic sleeve gastrectomy (group 1) when compared to obese pregnant women (control group) (4.1%) (3.2%) respectively, (P=0.001, P=0.01) respectively. There are no statistically differences between two groups regarding neonatal age at time of delivery, congenital malformation and still birth. **Conclusion** Our study recommends that obese women who are deciding to get pregnant to perform a bariatric surgery to decrease maternal and fetal morbidities and achieve good outcome.

#### Keywords:

Bariatric

surgery,

pregnancy

## INTRODUCTION

Bariatric surgical procedures can be classified as restrictive, malabsorptive/restrictive or malabsorptive<sup>1, 2</sup>. The most common bariatric procedure has been used in our country is sleeve gastrectomy. Sleeve gastrectomy is a restrictive procedure. It is a term for partial gastrectomy that is performed by removing a large portion of the stomach to create a long pouch that connects the esophagus to the small intestine. The mechanism of action of this procedure is that the resulting decrease in the stomach size inhibits distention of the stomach so that it becomes full sooner, thereby increasing the patient's sensation of fullness and decreasing their appetite. Some hypothesize increased satiety results from the decreased ghrelin, secreted by the fundus which is resected in sleeve gastrectomy<sup>3, 4</sup>.

Bariatric surgery has proved successful in reducing weight gain during pregnancy, when compared with pregnancies undergoing no such surgery and with matched control groups of pregnancies uncomplicated by obesity. Weight gain during pregnancy tended to be lower in patients who had previously undergone gastric bypass surgery, whose average weight gain was 12.7 kg as opposed to the 20.4 kg of pre-operative pregnancies, so it seems that bariatric surgery is able to determine an adequate weight gain during pregnancy<sup>5</sup>. Several case reports have described nutritional

deficiencies in women becoming pregnant after bariatric surgery.

Bebber et al. reported that these women frequently had had low levels of vitamin B12 (in 53.4% of cases), folic acid (16%), ferritin (41.7%), calcium (16.7%) and albumin (10%), that the authors attributed to the women's considerable weight loss before their pregnancy (47.8 + 22.2 kg)<sup>6</sup>. In a small study conducted on 32 pregnant women previously treated with bariatric surgery, Dell'agnolo et al. reported a high rate of anemia, with 17% of cases requiring blood transfusions<sup>6</sup>. However, systematic studies have failed to confirm this association. Complications associated with bariatric surgery during pregnancy are as follows: Internal hernias, Bowel obstruction, Banderosion or migration, Cholelithiasis, Hyperemesis, Severe anemia, Calcium, folate and vitamins D and B12 deficiency, and Protein-calorie malnutrition<sup>7, 8</sup>.

In a retrospective cohort study of US insurance claims of 585 women who had undergone bariatric procedures, Bennett et al. found that women who had delivered after their bariatric procedure (NV = 269) had substantially lower rates of preeclampsia and eclampsia (odds ratio 0.20, 95% confidence interval 0.09 to 0.44), chronic hypertension complicating pregnancy (0.39, 0.20 to 0.74), and gestational hypertension (0.16, 0.07 to 0.37), even after adjustment for age, multiple pregnancy, surgical procedure, and preexisting diabetes<sup>9</sup>. Similarly, in a large retrospective study of all women between 1988-2006 who delivered after

bariatric surgery in a tertiary unit in USA, Weintraub et al. found a significant reduction in the rates of gestational diabetes mellitus (17.3% versus 11.0%;  $P = 0.009$ ) and hypertensive disorders in pregnancy (23.6% versus 11.2%;  $P = 0.001$ ) after analyzing 301 deliveries preceding bariatric surgery and 507 following surgery<sup>10</sup>. The aim of this study is to detect the safety of the LSG during pregnancy and to assess the maternal as well as the fetal outcome in patients with LSG in comparison with control group.

## METHODOLOGY

This study is a retrospective cohort study that was conducted at Basra Maternity and child hospital from 1<sup>st</sup> January 2018 to 1<sup>st</sup> June 2020. The study analyzed the effect of Laparoscopic sleeve gastrectomy (LSG) on the maternal as well as fetal outcome. The entire 64 participant mothers had LSG and are of child bearing age (20-45 years), called (LSG) group 1. They were compared with 120 control mothers. Both the groups were matched with each others. All the medical and obstetrical problems were excluded from the studied group. The data of the patients were recorded from two main hospitals in Basra, and two private hospitals. It included 980 women who performed LSG. Around only 81 women who conceived after 1 year of LSG got pregnant. We can follow only 64 women until their delivery.

We lost around 12 women during follow up, and they were unreal to continue with the study. While 3 of them still

pregnant women by mobile phones were followed regularly and all were delivered in hospitals, and the information about the mode of delivery and the neonates were collected thoroughly. All included patients have their exact BMI before pregnancy and their weight gain during pregnancy was collected and it should not exceed 30kg/m<sup>2</sup>, it range from 18-30 kg/m<sup>2</sup>, and we compare them with 120 obese women who is BMI exceed 30 kg/m<sup>2</sup>, with no medically or obstetrical complications. The study was approved by Basra medical research ethic committee.

## Statistical analysis:

The significance of the differences between the two studied groups was assessed by Chi-square test and students't-test as appropriate. Statistical significance was defined as  $P < 0.05$ ,  $P < 0.001$ .

## RESULTS

A case control study of 64 pregnant women with LSG performed 1 year before pregnancy compared to 120 control pregnancy women, conducted at Basra, Iraq for around 2.5 years period. Table no. 1 show the characteristics between the two studied groups. Table No 1 showed the comparison of the demographic characteristics between the two studied groups. It was showed that there is no statistical difference between the two groups regarding the age, level of education and parity. There was also no significant difference between both groups regarding previous cesarean section, Antenatal care, and Weight gain in current pregnancy and smoking.

**Table 1: Demographic characteristics of the studied group**

	LSG group1 (64)	Control group (120) group 2	P-value
Age in year:			
20-34	46 (71.8)	86 (71.6)	0.998
≥35	18 (29.2)	34 (28.4)	0.432
Parity:			
Nullipara	34(53.1)	52(43.3)	0.098
1-4	26(40.7)	58(48.3)	0.679
≥5	4 (6.3)	10 (8.4)	0.783
Level of education:			
Illiterate	21 (32,8)	53 (43.4)	0.087
Primary school	30 (46.8)	50 (41.6)	0.306
Educated	13 (20.4)	18 (16)	0.823
Previous cesarean section:	21 (32.8)	41 (34.8)	0.985
Antenatal care:	64 (100)	98 (81.6)	0.954
Weight gain in current pregnancy:	18.2 ± 3.1	20.1± 1.2	0.128
Smoking	6 (9.3)	13 (10.83)	0.879

Table NO 3 demonstrate that women with LSG had an increase rate of small for gestational age babies(57.8%) and low apgar score in 5minutes (17.1%) in comparison to control group (4.1%), (3.2%) , respectively. There is no statistical difference between two groups regarding neonatal age at time of delivery, congenital malformation and still birth.

**Table 2: Maternal outcome in both studied groups**

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	(64) LSG group (1)	Control group (120) group 2	P-value
Hypertension	12 (18.7)	23 (19.1)	0.925
D.M	4 (6.25)	21 (17.1)	0.01
Abortion	6 (9.3)	11 (9.1)	0.995
Ante-partum hemorrhage	8(12.5)	16 (13.3)	0.765
Post partum hemorrhage	7 (10.9)	11 (9.1)	0.473
Anemia	21 (32.8)	11 (9.1)	0.01
Mode of delivery			
Normal vaginal delivery	31(48.4)	98 (73.3)	0.07
Cesarean section	32(50)	30 (25.1)	0.01
Instrumental	1 (1.6)	2 (1,6)	1.00

**Table 3: Neonatal outcome in both studied groups**

	LSG (64) group (1)	Control group (120) group (2)	P value
Neonatal age at time of delivery:			
28-36 weeks	21 (32.8)	30 (25)	0.122
37-41 weeks	38 (59.3)	79 (65.8)	0.093
≥41 weeks	5 (7.8)	18 (15)	0.083
Fetal weight (Kg):			
Small for gestational age	27 (57.8)	5 (4.1)	0.01
Large for gestational age	7 (10.9)	11 (9.1)	0.126
Apgar score:			
1 minute	23 (35,9)	32 (26.6)	0.099

5 minute	11 (17.1)	4 (3.2)	0.01
Admission to neonatal intensive care unit	2 (4.6)	4 (2.5)	0.231
Congenital malformation:	5 (4.9)	4 (3.3)	0.324
Still birth:	2 (3.1)	4 (3.2)	0.317

## DISCUSSION

From the reviewing of literatures globally about 300 million adults are obese depending for its diagnosis on BMI calculation and it was found that obesity defined as BMI above 30kg/m<sup>2</sup>[11]. Bariatric surgery has proved that a reduction in weight that occurs before pregnancy is a very effective and successful method when compared with pregnancy which don't compared with pregnancy which don't undergoes such surgery in a population in regards to maternal as well fetal outcome; especially when they matched with control patients who are complicated with obesity<sup>12</sup>. It was clearly noticed that the number of bariatric surgery had increased in the recent years among our society, and most of this patient were women at reproductive age.

Weight reduction is the most important method to decrease maternal and fetal morbidities during pregnancy, especially the medical disorders related to obesity such as diabetes mellitus, which was confirmed in our study as shown in table number 2. We found the decrease in

the risk of developing D.M in patient with (LSG) when compared to control group, and the statistical difference was significant and this can be explained that all the patients subjected to (LSG) when compared to control group, and the statistical difference was significant and this can be explained that all the patients that all the patients subjected to (LSG) there was improved in there lipid profile and their glucose metabolism and a healthy food intake style, and most of these patients were completely cured from DM after surgery and this finding was in agreement with other many study done by others<sup>13</sup>. In contrast, many other studies cannot found this positive correlation between DM reduction and (LSG), such a study done by Kjaer et al<sup>14</sup>.

As shown in the same table no. 2, we also found that hypertensive disorder in pregnancy was decreased in patients with (LSG) in the comparison with the control group, but this positive relation cannot be confirmed because the P value was not statistically significant (group 1) versus (group2), and it was in agreement if we

compare our finding with a study done by Dixon et al<sup>15</sup>. On the other hands, many studies confirm that a bariatric surgery decrease the rate of hypertensive disorder in pregnancy and it was statistically significant, such a study done by poker et al and others<sup>16, 17</sup>.

It was noticed there is a significant increase in the anaemia in pregnant women subjected to (LSG) Compared to non surgery control group ,and this attributed to increased iron loss and decrease iron absorption after (LSG), which in agreement with other study . [LSG] is higher than control groups (50% versus 25%), and it was with agreement with study done by Kaminionk et al<sup>18</sup>. We noticed an increased rate of preterm birth and increased in the rate of small for gestational age in patients with [LSG] versus the control group(32.8), (57.8)versus (25),(4.1), which might be due to the patients with [LSG]which lead to preterm labor and small for gestational age fetuses. In addition weight gain during iron absorption after (LSG) pregnancy was found to be correlated with new born fetus weight and this also was found in other study done by Santulli<sup>19</sup>.

For the same reason we found that apgar score in 1 and 5 minutes was low among pregnant women with (LSG) in comparison with control group-<sup>18, 19</sup>, and the differences was statistically significant. According to Iraqi health ministry, the absorption rate among our community was (13.5%)<sup>20</sup>. While on other hand obese women have increase rate of abortion

(22%) <sup>21</sup>. But we noticed in our study the abortion rate was (9.3%) when compared to control group, which was (9.1%) and it was not statically significant.

Also we know that the still birth rate in Basra was (1.6%) <sup>22</sup>. While in this study, it was found slightly higher in patient subjected to Laparoscopic sleeve gastrectomy (3.1%) when compare to control group which was (3.2%). And the difference was not significance. Although other studies were found that the stillbirth rate following Laparoscopic sleeve gastrectomy was decrease in such patients when we compare them with control obese women which were in agreement with other study done by Aboodely et al<sup>23</sup>.

## CONCLUSIONS

Our study recommends that obese women who are deciding to get pregnant to perform a bariatric surgery to decrease maternal and fetal morbidities and achieve good outcome.

We also recommend for the next study in the future having a large sample size, and we took a third group who are morbidly obese and follow them for a long period to confirm our finding. There were difficulties in communicating with some patients and confirming their information, after trying to call them several times with different methods, and we continued with only 64 candidates.

**Ethical approval: Obained from Basrah Hospital for Maternity and Children, Basrah, Iraq**

**Conflict of interest: nill**

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## REFERENCES

1. Fried, M., Hainer, V., Basdevant, A., et al. Interdisciplinary European guidelines for surgery for severe (morbid) obesity. *Obes Surg.* 2007;17(2):260-270.
2. Steinbrook, R. Surgery for severe obesity. *N Engl J Med.* 2004; 350(11):1075-1079.
3. Lin, E., Gletsu, N., Fugate, K, et al. The effects of gastric surgery on systemic ghrelin levels in the morbidly obese. *Arch Surg.* 2004; 139(7):780-784.
4. Langer, F.B., Hoda, M.A.R., Bohdjalian, A., et al. Sleeve gastrectomy and gastric banding: effects on plasmaghrelin levels. *Obes Surg.* 2005; 15(7):1024-1029.
5. Karmon, A., Sheiner, E. Timing of gestation after bariatric surgery: should women delay pregnancy for at least 1 postoperative year? *Am J Perinatol.* 2008;25(06):331-333.
6. Bebbber, F.E., Rizzolli, J., Casagrande, D.S., et al. Pregnancy after bariatric surgery: 39 pregnancies follow-up in a multidisciplinary team. *Obes Surg.* 2011 321(10):1546-1551.
7. Dixon, J.B., Dixon, M.E., O'Brien, P.E. Birth outcomes in obese women after laparoscopic adjustable gastric banding. *Obstet Gynecol.* 2005; 106(5):965-972.
8. Ducarme, G., Revaux, A., Rodrigues, A., Aissaoui, F., Pharisien, I., Uzan, M. Obstetric outcome following laparoscopic adjustable gastric banding. *Int J Gynecol Obstet.* 2007; 98(3):244-247.
9. Bennett, WL., Gilson, M.M., Jamshidi R., et al. Impact of bariatric surgery on hypertensive disorders in pregnancy: retrospective analysis of insurance claims data. *BMJ.* 2010; 340:c1662.
10. Weintraub, A.Y., Levy, A., Levi, I., Mazor, M., Wiznitzer, A., Sheiner, E. Effect of bariatric surgery on pregnancy outcome. *Int J Gynecol Obstet.* 2008; 103(3):246-251.
11. James, P.T. Obesity: The worldwide epidemic. *Clin Dermatol.* 2004; 22(4):276-280.
12. Wittgrove, A.C., Jester, L., Wittgrove, P., Clark, G.W. Pregnancy following gastric bypass for morbid obesity. *Obes Surg.* 1998;8(4):461-464.
13. Burke, A.E., Bennett, W.L., Jamshidi, R.M., et al. Reduced incidence of gestational diabetes with bariatric surgery. *J Am Coll Surg.* 2010;211(2):169-175.
14. Kjaer, M.M., Lauenborg, J., Breum, B.M., Nilas, L. The risk of adverse pregnancy outcome after bariatric surgery: a nationwide register-based matched cohort study. *Am J Obstet Gynecol.* 2013;208(6):464-e1,

15. Dixon, J.B., Dixon, M.E., O'Brien, P.E. Pregnancy after Lap-Band surgery: management of the band to achieve healthy weight outcomes. *Obes Surg.* 2001; 11(1):59-65.
16. Parker, M.H., Berghella, V., Nijjar, J.B. Bariatric surgery and associated adverse pregnancy outcomes among obese women. *J Matern Neonatal Med.* 2016; 29(11):1747-1750.
17. Buchwald, H., Williams, S.E. Bariatric surgery worldwide 2003. *Obes Surg.* 2004; 14(9):1157-1164.
18. Kominiarek, M.A. Preparing for and managing a pregnancy after bariatric surgery. In: *Seminars in Perinatology.* Vol 35. Elsevier; 2011:356-361.
19. Santulli, P., Mandelbrot, L., Facchiano, E., et al. Obstetrical and neonatal outcomes of pregnancies following gastric bypass surgery: a retrospective cohort study in French referral centre. *Obes Surg.* 2010; 20(11):1501-1508.
20. Al-Gassar, S.A.M., Hasan, N.N., Atyia, L.M. The association between abnormal body mass index and first trimester spontaneous abortion in Iraqi women: Case Control Study. *Indian J Public Heal Res Dev.* 2019; 10(6):1199-1203.
21. Katz, V.L. Spontaneous and recurrent abortion. *New York Compr Gynecol.* 2012:335.
22. Shiaa, N.R., Issa, S.S., Subber, B.A.L. Maternal and fetal determinants of stillbirth among women who attending maternity departments of Basra central Hospitals. *Indian J Public Heal Res Dev.* 2019; 10(9):1218-1223.
23. Abodeely, A., Roye, G.D., Harrington, D.T., Cioffi, W.G. Pregnancy outcomes after bariatric surgery: maternal, fetal, and infant implications. *Surg Obes Relat Dis.* 2008; 4(3):464-471.