

## Special Article - Bariatric Surgery

# Weight Loss Outcomes of Patients with Unplanned Pregnancy within a Year of Bariatric Surgery

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## Abstract

**Background:** ASMBS guidelines state that pregnancy is to be discouraged during the first 12–18 months post bariatric surgery and until the weight loss stabilizes. There are studies looking at the weight loss outcomes after bariatric surgery in patients who get pregnant after 18 to 24 months. The aim of our study was to evaluate weight loss achieved over two years after bariatric surgery by women who became pregnant within the first post-operative year.

**Methods:** Ten patients became pregnant within 12 months of Roux-en-Y gastric bypass (RYGB). Data including weight loss outcomes were obtained. Similar data was collected on matched non-pregnant women who had same operation in the same period.

**Results:** The mean age was 31 and 32 years and the mean preoperative weight was 129.2 kgs and 131.4 kgs in pregnant group (PG) and the Non-pregnant group (NPG) respectively. The mean excess weight loss was 54.2%, 65.9%, 64.4% and 54.1%, 73.8%, 74.7% at 6, 12 and 24 months in the PG and NPG respectively. No significant difference was seen in both groups.

**Conclusion:** Our experience with small number of patients suggests that satisfactory weight loss outcomes can be achieved in patients with pregnancy within the first year of bariatric surgery. Bariatric bodies (ASMBS, BOMSS) should explore possibility of providing flexible guidelines to all child bearing age patients and be patient centered with vigilant follow-up. We invite all bariatric surgeons to report pregnancy outcomes in the first year to further the evidence that would attest to the safety of such early pregnancy.

**Keywords:** Bariatric Surgery; Obesity Surgery; Pregnancy; Weight loss outcomes

## Abbreviations

RYGB: Roux-en-Y Gastric Bypass; EWL: Excess Weight Loss; ASMBS: American Society for Metabolic and Bariatric Surgery; BOMSS: British Obesity and Metabolic Surgery Society

## Introduction

Bariatric surgery is effective in treating obesity and is becoming popular. Morbid obese females represent 73% to 80% of all patients undergoing bariatric surgery. 43% of these are in the childbearing group [1]. One of the advantages of surgery is increased fertility, resulting in pregnancies after surgery in patients who were unable to conceive previously.

The current recommendation from American Society for Metabolic and Bariatric Surgery (ASMBS) is to delay pregnancy for 12–18 months during the rapid weight loss phase and until the weight loss stabilizes [2]. It also states that women in the reproductive age group undergoing bariatric surgery should be appropriately counseled regarding contraception post operatively (non-oral) and those who get pregnant should undergo surveillance for appropriate weight gain/loss, fetal health, nutritional deficiencies. This is a grade D recommendation and is based on early reports pointing out that pregnancy during this period may affect foetal growth and maternal

weight loss. British Obesity and Metabolic Surgery Society (BOMSS) recommend the same [3]. The Royal College of Obstetricians and Gynecologists (RCOG) recommend a “more personalized approach, taking into account maternal age” [4]. Presently there are no controlled studies that validate these recommendations.

The aim of our study was to evaluate weight loss outcomes in women who became pregnant after bariatric surgery, prior to the recommended 12–18 months. We compared it to a cohort of non-pregnant women who underwent same surgery in the same period.

## Methods

It is normal practice in our unit to prospectively maintain NLOSS (North London Obesity Surgery Service) database of all patients who are operated at our tertiary center. Data from July 2007 to July 2010 was retrospectively analyzed. We identified patients who became pregnant within the first year of Roux-en-Y gastric bypass (RYGB). Information was also collected from medical records including clinic letters and a short telephone survey. Data regarding age, comorbidities, preoperative weight, body mass index (BMI) was collected from clinic letters. Post-operative weight loss information at 6, 12 and 24 months was obtained from the 6 monthly follow up clinic letters and the weight at conception and time between surgery and conception data was collected either via the clinic letters if available

**Table 1:** Comparison of Basic Demographics of both groups.

	Pregnant Group (PG)	Non-pregnant Group (NPG)	P value
Age years (Range)	31 (22-44)	32 (24-45)	0.2
Pre-operative weight kgs (Range)	129.1 (110-149)	131.4 (114-151)	0.73
Pre-op BMI kg/m <sup>2</sup> (Range)	45.2 (38.8-56.2)	49.5 (39.1-57)	0.08

**Table 2:** Comparison of % Excess Weight Loss (EWL) of both groups at different follow up period.

% EWL Mean (Range)	Pregnant Group (PG)	Non-pregnant Group (NPG)	P value
6 months follow up	54.20% (23-67)	54.10% (34-94)	0.82
12 months follow up	65.90% (25-87)	73.80% (50-112)	0.24
24 months follow up	64.40% (1-110)	74.70% (50-119)	0.23

or through the telephone survey.

A control group of 10 patients who did not conceive within the first 24 months after the operation were compared to our study group. These patients were also recruited from our hospital NLOSS database and matched for sex, age, BMI, time of operation and type of operation with the pregnant group. They had RYGB performed during the same period. Revision bariatric cases were excluded.

Statistical tests used were unpaired t test for continuous variable and Fisher test for non-parametric values. P value of <0.05 was considered statistically significant.

## Results

There were 10 pregnancies within the first year after RYGB. These patients were informed pre-operatively of the recommendations of BOMSS guidelines by our bariatric unit. All these pregnancies were unintentional. The various contraception methods used were oral contraceptive pill (3 patients), condom [2], patch [1], and rhythm technique [4]. Nine were singleton pregnancies and one had twins. Half of the patients were primi-gravida. All the pregnancies were term pregnancies, had uncomplicated deliveries and neonatal outcomes were satisfactory.

The mean age of the pregnant group (PG) was 31 years (Range 22-44) compared to the mean age of 32 years (Range 24-45) of the non-pregnant group (NPG). The mean preoperative weight of the PG and NPG was 129.1 (110-149) kgs and 131.4 (114-151) kgs and BMI was 45.2kg/m<sup>2</sup> (38.8-56.2) and 49.5kg/m<sup>2</sup> (39 -57) respectively. There was no significant difference in the basic demographics for both the groups. The median follow up was 24 months for both the groups. The patients conceived at mean 6.67 months (Range 0.23 to 11 months) after bariatric surgery. Data is shown in Table 1.

The NPG patients had an average Excess Weight Loss (EWL) loss of 54.1% at 6 months, 73.8% at 12 months and 74.7% at 24 months after surgery. The patients in PG had a EWL of 54.2% at 6months, 65.9% at 12 months and 64.4% at 24 months after surgery. There was no significant difference in EWL between PG and NPG at 6 months (*p* value=0.82), 12 months (*p* value = 0.24) or at 24 months (*p* value= 0.23). Data is shown in Table 2.

Figure 1 shows EWL at 6, 12 and 24 months.

The fetal outcomes were reported as satisfactory by the neonatal



team. The purpose of our study was to concentrate on the WL outcomes and hence the fetal outcomes were not looked at into details.

## Discussion

Morbid obesity is on the rise worldwide especially in women of reproductive age group. This can render some women sub fertile or infertile. Polycystic ovarian syndrome (PCOS) is the major cause of anovulation and is generally associated with obesity. Bariatric surgery is effective in treating obesity and is gaining popularity. Growing evidence suggests that bariatric surgery improves fertility especially in women with PCOS. Three of our primigravida patients suffered from PCOS. Rapid weight loss seen in the initial months improves fertility [5]. The biochemical changes show normalization of hormones post-surgery similar to women who lose weight by other means [6].

Willis et al [7] suggests that pregnancy after bariatric surgery appears to reduce the risk of complications such as fetal macrosomia, gestational diabetes mellitus, and hypertensive disorders of pregnancy.

Johansson et al [8] concluded that small for gestational age was associated more among women who conceived  $\geq$  1.8 month after bariatric surgery. It was suggested that pregnancy after bariatric surgery might potentially increase the risk of stillbirth or neonatal death. None of our patients had stillbirth.

Alatish et al [9] observed that pregnancy after bariatric surgery did not adversely affect weight loss. Their %EWL at median follow up of 30 months was 70%. This was comparable to our results.

Printen and Scott [10] found that pregnancy within the period of rapid weight loss did not adversely affect the mother or developing foetus.

Froylich et al [11] suggested that pregnancy before bariatric surgery was a significant negative predictor for weight loss compared to the nonpregnant group. The % EWL in a group of 24 patients whose mean from bariatric surgery to delivery was 22 months was 53% +/- 27 at mean follow up of 50 months.

Bariatric surgeons and dieticians should include contraceptive counselling in their preoperative workup and must inform the referring physician of preferably discouraging the pill for contraception, as the recommendation suggests [2]. This is on the assumption that there might possibly be some alteration of metabolism due to the bypass

as was also seen in three of our patients who got pregnant while on the pill post bypass. This is however not well established in literature. All the pregnancies of our 10 patients had uncomplicated deliveries and neonatal outcome was satisfactory. Based on the published series so far there is no evidence to suggest that delivery complications or neonatal outcomes are higher in this group of patients [12-14].

All our patients had unintentional pregnancy. If pregnancy is intentional then post bariatric supplements can be better planned. BOMSS guidelines suggest that women with obesity should be taking 5mg of folic acid until the 12<sup>th</sup> week of pregnancy as there may be increased risk of neural tube defects affecting pregnancy compared to 400mcg/day folic acid for healthy women. Werler et al [15] examined neural tube defects in obese women along with their daily folate intake and concluded that women with an absolute body weight greater than 70kg were not protected against neural tube defects with the recommended daily intake of folate. They also found that the risk of neural tube defects increases with maternal weight regardless of folic acid intake. Vitamin A supplements in the retinol form are to be avoided in the first 12 weeks of pregnancy. This especially increases the teratogenic risk in the first trimester. Vitamin A in the beta carotene form should be advised instead [3]. If the pregnancy were well planned then these recommendations could be adhered to.

In recent years, several case series have been published which show that pregnancy does not affect weight loss post bariatric surgery whether the pregnancy occurs during the not recommended period (12-18 months) or otherwise [16]. There may be slowing of weight loss initially but does not affect it in the long term five year follow up [17].

Kjaer MM et al [18] studied 158 women who conceived within the first year and 128 later after RYGB. There was no statistically significant difference ( $p > 0.05$ ) between the two groups regarding neonatal birth weight, gestational age, risk of preeclampsia, gestational diabetes mellitus, labour induction, caesarean section, postpartum haemorrhage (>500ml), preterm birth (before 37 weeks), small for gestational age, large for gestational age, or Apgar score (5min) below 7, or in the need of neonatal intensive care. They concluded that there was no evidence to support a recommendation to delay pregnancy until after the first postoperative year. At present, the optimal time for pregnancy after gastric bypass is unknown.

Since more patients are undergoing Roux-en Y gastric bypass surgery, these issues will become more common and prevalent. Mahawar et al [19] had suggested that the optimum time for pregnancy should be after the weight has been stable for at least 2 months.

Patients do regain weight after bariatric surgery. It is possible that as per the recommendation if the patient waits till 18 months for conceiving then she might start regaining weight and hence miss the window of opportunity of getting pregnant. A large proportion of young women go through the bariatric pathway with the primary aim to be able to conceive in the future.

Limitations of our studies are that it is a retrospective study in a small number of patients. However prospective studies are challenging because of the guidelines recommending the patients not to get pregnant within 12 to 18 months and also because of the

uncertainty regarding conception. Other limitation is matching to non-pregnant patients. To avoid bias, matching was done for sex, age, BMI, time of operation and same bariatric procedure performed. Our experience is with patients who had RYGB. This is less mal-absorptive procedure compared to Bilio-Pancreatic Division (BPD) and Single anastomosis duodenal ileal bypass with sleeve gastrectomy (SADI-S) procedures. On the other hand laparoscopic adjustable gastric band and sleeve gastrectomy are more restrictive and are less mal-absorptive compared to RYGB. Hence we cannot apply our results to these procedures.

## Conclusion

Our study, although small, shows that patients get satisfactory weight loss outcomes even though they get pregnant within the first 12 months of bariatric surgery. However, until we have stronger evidence or better understanding of the maternal and the foetal outcomes, it may be prudent to continue with the current recommendation. Instead of a blanket recommendation to patients to not get pregnant in the first 12-18 months after bariatric surgery, our suggestion for the future to the guideline setting societies (ASMBS, NICE, BOMSS) would be, to explore possibilities of providing flexible guidelines best suited to individual needs and be more patient centered. We invite all bariatric surgeons to report pregnancy outcomes in the first year to further the evidence that would attest to the safety of such early pregnancy.

## Author Contribution

PS conceived the idea for the topic. CP participated in literature search. BP, TK and PS collected most of the data and analysed it. CP did majority of manuscript writing. All authors have seen the final version and approve of it.

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