Preoperative leptin fat mass ratio is not a predictive factor of weight loss after bariatric surgery

Deeba Siddiqui, Indraprastha Apollo Hospital, New Delhi

- For patients struggling with traditional weight loss methods, bariatric surgery may be a viable option.

- Bariatric procedures have become increasingly common due to low rates of complications, cost effectiveness, and reduction of comorbidities (Buchwald, 2005; Panteliou and Miras, 2017). There is a 5.6% increase from 2011 and a 44.3% increase from 2015 (ASMBS, 2018).

Due to the increasing use of bariatric surgery coupled with imperfect realization of weight loss after surgery (ASMBS, 2018), it is essential to understand the factors that may influence its success.

CONFLICT OF INTEREST DISCLOSURE

I have no potential conflict of interest to report

Understanding Leptin Resistance:

A relatively novel phenomenon termed “leptin resistance” (Myers et al., 2012), may be a potential barrier to bariatric weight loss success in general.

Obesity appears to dysregulate leptin signaling (Gruzdeva et al., 2019). When an individual become resistant to leptin, the brain does not respond to the satiety signal, even when they have ingested sufficient food. Thus, paradoxically, in obese individuals, high leptin values may indicate leptin resistance and no longer trigger satiety.

Leptin is secreted proportionally by adipocytes, or fat cells, which indicate to the brain how much fat is stored. Many researchers point to leptin resistance as a causal factor of continued obesity. To our knowledge, it remains unknown, however, if leptin resistance persists after bariatric surgery, thereby reducing the chance of successful weight loss after surgery.

- **Our study attempts to quantify whether or not baseline leptin levels may be a potential impediment to weight loss after surgery.**

- **There is a lack of consensus regarding which factors predict success after bariatric surgery (Panteliou and Miras, 2017).**

- **If excess leptin levels are a significant barrier to successful weight loss after bariatric surgery, it is important to include that component in holistic weight loss guidance.**

- **Leptino-resistance (LR) in obese patients may influence weight loss after bariatric surgery, as it decreases leptin's action on satiety and energy expenditure.**

- **Leptin Fat mass Ratio (LFR) reflects LR through high fat-mass-adjusted plasmatic leptin, and was studied here as a potential predictive factor of weight loss 24 months after bariatric surgery.**

LFR was defined as:

[Leptin (ng/ml)/Fat mass (%)]

Materials and Methods:

The study was conducted among the prospective monocentric cohort of patients undergoing bariatric surgery at Indraprastha Apollo Hospital, New Delhi .

Data on age, sex, height and type of surgery was collected at baseline.

Weight, Body Mass Index (BMI), plasmatic leptin and bio impedance-Fat Mass were assessed at baseline and at 3, 6,12, and 24 months postoperatively.

LFR was defined as

[Leptin (ng/ml)/Fat mass (%)]

Excess BMI Loss (EBL) was defined as

[(preoperative BMI - current BMI)/(baseline BMI- 25)]

Oral Glucose Tolerance Test

- Participants were asked to fast overnight and to take no medications on the day of the examination.
- Fasting blood samples were collected before ingestion of 75 g of glucose dissolved in 250 mL water to start the OGTT.
- Additional blood samples were drawn at 30, 60, 90, and 120 min after the oral glucose load.

Body Composition

- As leptin is known to be produced in the adipose tissue, it was considered necessary to adjust leptin values for fat mass.

- For this purpose, body composition was measured in all participants at the examination using a combination of bioelectrical impedance analysis InBody 770

Retrospective multivariate regression analysis evaluated the predicting value of baseline LFR on 24 months-postoperative EBL (24_%EBL).

T-student test compared baseline, 3, 6 and 12 months-postoperative LFR in patients with 24 months-postoperative %EBL > 50% and 24 months-postoperative %EBL < 50%.

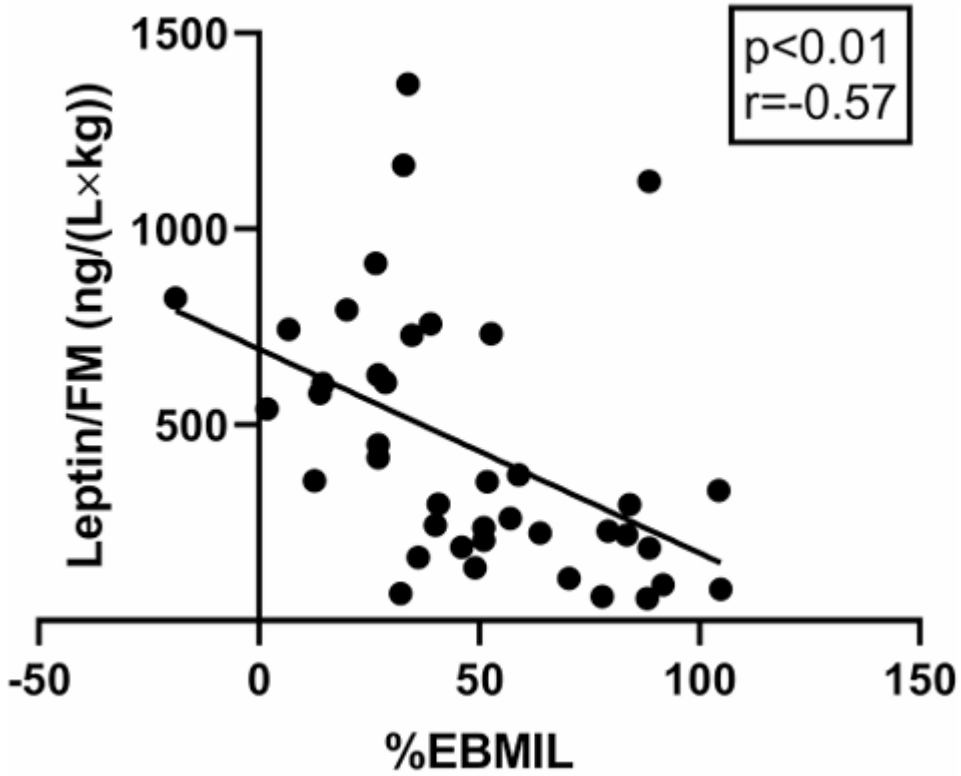
EBL= Excess BMI loss
(24_%EBL=24 months-postoperative EBL

Results:

Number (182)	
Gender	**Female-135 Male-45**
Age	**44.6**
Weight	**120.6**
BMI	**43.7 kg/m2**
Procedure	**Gastric Bypass 81.9% Sleeve Gastrectomy 18.1%**
Baseline LFR	**124**
LFR at Nadir	**70**

Results:

- No significant correlation between baseline LFR and 24_%EBL was shown (p-value <0.01).
- Mean preoperative LFR was not different between patients with 24_%EBL > 50% and < 50% (absolute difference 0.37, p-value = 0.79).
- However, mean LFR at 6 month was higher in 24_%EBL < 50% (p-value = 0.047).



Postsurgical weight loss, measured as %EBMIL, correlated negatively with fat mass–adjusted fasting plasma leptin ($r = -0.57$, $p < 0.001$, Fig. 1).

Conclusion:

Preoperative LFR does not appear as a predictive factor of weight loss after bariatric surgery. This suggests that LR is not a major player in weight loss following surgery.


THANK
YOU