

## **Liraglutide Augments Extra Body Weight Loss after Sleeve Gastrectomy without Change in Intrahepatic and Intra-Pancreatic Fat in Obese Individuals: Randomized, Controlled Study**

**Authors :** Ashu Rastogi, Uttam Thakur, Jimmy Pathak, Rajesh Gupta, Anil Bhansali

**Abstract :** Introduction: Liraglutide is known to induce weight loss and metabolic benefits in obese individuals. However, its effect after sleeve gastrectomy are not known. Methods: People with obesity (BMI>27.5 kg/m<sup>2</sup>) underwent LSG. Subsequently, participants were randomized to receive either 0.6mg liraglutide subcutaneously daily from 6 week post to be continued till 24 week (L-L group) or placebo (L-P group). Patients were assessed before surgery (baseline) and 6 weeks, 12weeks, 18weeks and 24weeks after surgery for height, weight, waist and hip circumference, BMI, body fat percentage, HbA1c, fasting C-peptide, fasting insulin, HOMA-IR, HOMA-β, GLP-1 levels (after standard OGTT). MRI abdomen was performed prior to surgery and at 24weeks post operatively for the estimation of intrapancreatic and intrahepatic fat content. Outcome measures: Primary outcomes were changes in metabolic variables of fasting and stimulated GLP-1 levels, insulin, c-peptide, plasma glucose levels. Secondary variables were indices of insulin resistance HOMA-IR, Matsuda index; and pancreatic and hepatic steatosis. Results: Thirty-eight patients undergoing LSG were screened and 29 participants were enrolled. Two patients withdrew consent and one patient died of acute coronary event. 26 patients were randomized and data analysed. Median BMI was 40.73±3.66 and 46.25±6.51; EBW of 49.225±11.14 and 651.48±4.85 in the L-P and L-L group, respectively. Baseline FPG was 132±51.48, 125±39.68; fasting insulin 21.5±13.99, 13.15±9.20, fasting GLP-1 2.4± .37, 2.4± .32, AUC GLP-1 340.78± 44 and 332.32 ± 44.1, HOMA-IR 7.0±4.2 and 4.42±4.5 in the L-P and L-L group, respectively. EBW loss was 47± 13.20 and 65.59± 24.20 (p<0.05) in the placebo versus liraglutide group. However, we did not observe inter-group difference in metabolic parameters between the groups in spite of significant intra-group changes after 6 months of LSG. Intra-pancreatic fat prior to surgery was 3.21±1.7 and 2.2±0.9 (p=0.38) that decreased to 2.14±1.8 and 1.06±0.8 (p=0.25) at 6 months in L-P and L-L group, respectively. Similarly, intra-pancreatic fat was 1.97±0.27 and 1.88±0.36 (p=0.361) at baseline that decreased to 1.14±0.44 and 1.36±0.47 (p=0.465) at 6 months in L-P and L-L group, respectively. Conclusion: Liraglutide augments extra body weight loss after sleeve gastrectomy. A decrease in intra-pancreatic and intra-hepatic fat is noticed after bariatric surgery without additive benefit of liraglutide administration.

**Keywords :** sleeve gastrectomy, liraglutide, intra-pancreatic fat, insulin

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