



# The Effects on Obesity Related Peptides of Laparoscopic Gastric Band Applications in Morbidly Obese Patients



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## INTRODUCTION

The recent explosion in obesity research has resurrected many peptides whose functions were either unknown, poorly understood or associated with other bioprocesses not believed to be tied to energy homeostasis. Many different hormones control our weight and appetite. The discovery of new peptide hormones, which suppresses appetite for up to 12 hours, may lead to a better understanding of this complex control system(1-6). The aim of this study is to examine the relationship between resistin, apelin, chemerin, visfatin and weight loss after laparoscopic adjustable gastric banding (LAGB).

## MATERIAL AND METHODS

In this study conducted in I.U. Cerrahpasa Faculty of Medicine, Department of General Surgery, 20 patients with BMI:  $46.82 \pm 4.47$  who have received laparoscopic gastric banding upon morbid obesity diagnosis and a control group of 20 healthy volunteers with normal BMI ( $22.52 \pm 2.08 \text{ kg/m}^2$ ) were enrolled. We collected fasting blood samples one time from the non-obese persons as well as the morbidly obese patients before, 1 and 6 month after the LAGB. Plasma levels of apelin, resistin, chemerin and visfatin levels have been evaluated by ELISA method.

### Statistical analyses

Data were analysed by using the SPSS for Windows (Version 10, SPSS) statistical software package. Data are presented as the mean  $\pm$  standard deviation (SD). Student's t-test was used for comparing results. The two-sample paired Wilcoxon signed rank test was used to compare the pre-op and post-op values of parameters of morbidly obese group. Correlations were calculated using Spearman rank-order correlation coefficients.  $P < 0.05$  was considered statistically significant.

## RESULTS

The principal anthropometric and biochemical data of the morbidly obese and control are summarized in Table 1 and Table 2.

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Table 1. Clinical measurements, metabolic parameters in controls and morbidly obese patients

	Controls (n:22)	Morbidly Obese Baseline (n:19)	P*
M/F	9/13	8/11	
Age (year)	$33.00 \pm 5.72$	$34.11 \pm 10.26$	NS
Body weight (kg)	$68.23 \pm 12.05$	$134.37 \pm 22.76$	0.000
BMI (kg/m <sup>2</sup> )	$22.86 \pm 2.45$	$48.73 \pm 6.62$	0.000
Fasting plasma glucose (mg/dl)	$82.64 \pm 8.62$	$108 \pm 27.60$	0.002
Fasting plasma insulin (μIU/ml)	$0.85 \pm 0.30$	$20.49 \pm 9.70$	0.000
HOMA-IR	$1.55 \pm 0.48$	$5.82 \pm 3.98$	0.000
Fasting plasma apelin (ng/ml)	$0.27 \pm 0.02$	$0.39 \pm 0.06$	0.000
Fasting plasma resistin (ng/mL)	$4.95 \pm 1.17$	$8.75 \pm 1.93$	0.000
Fasting plasma chemerin (ng/ml)	$233.95 \pm 26.93$	$298.21 \pm 38.88$	0.000
Fasting plasma visfatin (ng/mL)	$10.53 \pm 2.35$	$16.88 \pm 2.59$	0.000

Values are represented as (mean  $\pm$  SEM).

BMI; body mass index; HOMA-IR; Homeostatic model assessment -insulin resistant.

NS; not significant

P<0.05 statistical significance

Table 2. Metabolic parameters in baseline morbidly obese patients (preoperative, 1 and 6 months after laparoscopic gastric band applications).

	Baseline (n:19)	1 month after operation (n:19)	6 month after operation (n:19)
Body weight (kg)	$134.37 \pm 22.76^*$	$128.89 \pm 21.87^*$	$107.05 \pm 17.95^*$
BMI (kg/m <sup>2</sup> )	$48.73 \pm 6.62^*$	$46.76 \pm 6.56^*$	$38.88 \pm 5.65^*$
Fasting plasma glucose (mg/dl)	$104.74 \pm 29.79$	$99.68 \pm 18.23$	$99.63 \pm 16.09$
Fasting plasma insulin (μIU/ml)	$18.74 \pm 7.18^*$	$13.04 \pm 3.27^{*#}$	$9.49 \pm 2.05^*$
HOMA-IR	$5.16 \pm 3.45^*$	$3.26 \pm 1.24^*$	$2.33 \pm 0.64^*$
Fasting plasma apelin (ng/ml)	$0.39 \pm 0.06^*$	$0.36 \pm 0.06^{*#}$	$0.30 \pm 0.04^*$
Fasting plasma resistin (ng/mL)	$8.75 \pm 1.93^*$	$7.29 \pm 1.89^*$	$5.68 \pm 0.95^*$
Fasting plasma chemerin (ng/ml)	$298.21 \pm 38.88^*$	$277.68 \pm 40.84^*$	$230.00 \pm 29.63^*$
Fasting plasma visfatin (ng/mL)	$16.88 \pm 2.59^*$	$13.75 \pm 2.48^{*#}$	$11.05 \pm 2.01^*$

BMI; body mass index; HOMA; IR; Homeostatic model assessment -insulin resistant.

NS; not significant

\*P < 0.05 versus baseline; #P < 0.05 versus 6 month after operation.

Results are reported as mean  $\pm$  SEM

## CONCLUSION

- The present work indicates the potential link of apelin, resistin, chemerin and visfatin with the pathogenesis of obesity.
- Body weight loss was not associated with markers of improved insulin sensitivity.
- Apelin and visfatin levels decreased significantly 1 months after bariatric surgery. However, resistin and chemerin decreased significantly 6 months after bariatric surgery.
- Plasma visfatin concentration correlated with weight loss in 1 month after operation.
- There was no mortality and LAGB is effective treatment of morbid obesity which leading to a reduction in this peptides