Autonomic functions and serum leptin levels in normal and obese, a comparative study

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A close association has been observed between autonomic nervous system activity and obesity. The imbalance of the activity of sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS) contributes to the onset of obesity. The present study aims to evaluate autonomic functions and serum leptin levels in obese people.

Sixty female medical students were selected in the age group of 18 to 24 years which were further divided in two groups on the basis of body mass index: normal weight female medical students (BMI: < 25); and overweight female medical students (BMI: ≥ 25) by using stratified random sampling method. Their anthropometric measurements were height, weight, BMI and body fat percentage. Exclusion criteria were those on any medication affecting autonomic nervous system and those suffering from any metabolic disorder (*e.g.* diabetes mellitus, thyroid disorder), cardiovascular disorder, neuropsychiatric disorder. Height and weight were measured by using anthropometric scale detecto-medic scale. The following measurements were carried out in all the subjects: resting heart rate; resting blood pressure; serum leptin level; thyroid function; and autonomic function. Serum leptin was measured by leptin sandwich ELISA EIA-2395.

The resting heart rates in the overweight subjects were significantly higher as compared to the normal weight subjects and there was a significant decrease in parasympathetic activity in the overweight as compared to normal weight subjects. There was a significant lower R-R interval during expiration, and also lower expiration/inspiration durations (E/I) ratio in overweight subjects as compared to normal weight subjects. There was also a significant negative correlation between body mass index and E/I ratio as well as to the Valsalva ratio (ratio of the longest RR interval after the Valsalva maneuver divided by the shortest RR interval during the test). The serum Leptin was significantly greater in overweight subjects as compared to normal weight subjects and also there was a significant positive correlation between log of serum leptin and % body fat. A significant negative correlation of leptin with 30:15 ratio and a positive correlation with maximum systolic blood pressure as well as maximum rise in systolic blood pressure during cold pressor test indicates that leptin may be associated with an increased sympathetic activity and a decreased parasympathetic activity in overweight subjects.