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**Leptin's relationship to fat mass in women recovering from
anorexia nervosa and healthy weight controls**

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BACKGROUND:

Leptin is a hormone secreted by adipose tissue which has been suggested to impact on various endocrine as well as neuroendocrine systems disturbed in anorexia nervosa (AN). Its alteration in AN has been incompletely described.

OBJECTIVE:

It was the purpose of the current investigation to examine leptin's relation to body fat mass (BF) at low weight and weight normalization in AN and also in comparison to healthy adults.

SUBJECTS:

40 women with AN and 15 healthy controls matched for age, body mass index (BMI) and gender participated in the study.

METHODS:

AN subjects were admitted and treated. Treatment included structured, behaviorally oriented inpatient program aimed at weight gain. Body fat mass was determined twice for AN (at low weight and upon weight normalization) and once for healthy controls by anthropometric measures, dual x-ray absorptiometry (DXA). Similarly, leptin concentrations were assessed for patients at both assessment points and once for controls.

RESULTS:

With hospitalization and treatment (including psychotherapy and weight gain), measurements of BMI, percentage and total body fat mass as well as absolute serum leptin levels increased significantly ($p < 0.001$). Leptin per fat mass was the single variable that did not change significantly over treatment or when compared to healthy controls. Leptin levels increased in proportion to increases in fat mass. Observed correlations were only significant at low weight ($R = 0.708$, $p < 0.001$) and weight recovery ($R = 0.711$, $p < 0.001$), but not for healthy controls. Although leptin's relation to fat mass appeared linear across groups, results of analysis including graphical illustration of fit lines at subgroups imply a different quality amongst leptin's relationship to fat mass. BMI was predictive of body fat mass at low weight only ($R = 0.547$, $p < 0.001$).

CONCLUSION:

Leptin and fat mass seem to be linearly related, although the slope of the relationship between the two differs between groups. Leptin per fat mass is not significantly different between groups. BMI is predictive of fat mass at low weight, but loses its predictive power with weight gain.

RECOMMENDATIONS:

The observed variability in leptin levels upon weight recovery warrants further investigation. BMI's predictive power on fat mass in low weight is in need of future replication and validation.