Evaluation of acylated ghrelin and obestatin levels and ghrelin/obestatin ratio in obesity

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Background: Ghrelin is 28-amino acid peptide predominantly produced by the stomach and have an orexigenic property as well as potent GH-releasing activity. Acylated ghrelin (AG) is the active form of this hormone. Obestatin is a 23-amino acid peptide, is produced by post-translational modification of a protein precursor that also produces ghrelin. Obestatin has the opposite effect of ghrelin on food intake.

Objective and hypotheses: To evaluate acylated ghrelin and obestatin levels in obese and normal weight children and adolescents and their association with metabolic syndrome (MetS) and its parameters.

Method: Children and adolescents, 73 (31 normal weight control; 42 obese), aged 7-16 years, Serum AG, obestatin, insulin (ELISA), fasting plasma glucose (FPG), triglyceride (TG), total cholesterol (TC), low and high density lipoprotein (LDL-C and HDL-C) were measured. Insulin resistance was calculated by Homeostasis Model Assessment of Insulin Resistance (HOMA-IR). Metabolic syndrome was determined according to IDF criteria. Data for AG and obestatin were presented as median (25-75 percentiles).

Results:

- For AG levels:
  - Normal: 124.12 (56.28-193.11) pg/ml
  - Obese: 267.9 (193.6-450.3) pg/ml

- For Obestatin levels:
  - Normal: 60.0 (22.04-70.0) pg/ml
  - Obese: 22.65 (14.92-64.0) pg/ml

- For ghrelin to obestatin ratio:
  - Normal: 0.68 (0.36-1.3)
  - Obese: 0.13 (0.07-0.26)

- For metabolic syndrome:
  - AG levels:
    - No: 180.8 (123.2-214.8) pg/ml
    - Yes: 307.4 (160.7-497.4) pg/ml
  - Obestatin levels:
    - No: 227.9 (193.6-300.7) pg/ml
    - Yes: P < 0.05

- For HOMA-IR:
  - No: P < 0.05
  - Yes: P < 0.05

Acylated ghrelin had significant negative correlation with BMI-SDS, TG and HOMA-IR and obestatin has positive correlation with BMI-SDS as well as HOMA-IR.

Conclusion: Ghrelin is decreased and obestatin is elevated in obesity. So these are not the cause but are the effect of obesity. Obestatin is a valuable marker to investigate metabolic syndrome.