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Neudesin Plasmatic Levels and Glucose Metabolism in Obese and Overweight Children: Preliminary Data

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Neudesin, a newly discovered peptide mainly secreted in brain and adipose tissue, is under evaluation for its possible activity as negative regulator of energy expenditure. In pre-adipocyte cultures neudesin promotes adipogenesis, while in mice model neudesin decreases food intake. Childhood overweight and obesity are among the main health issues in modern times, especially in western countries, due to the association to increased cardiovascular and oncological risk in adult age. No data on neudesin in obese and overweight children are currently available. Given that, we aim to perform an observational cross-sectional study testing the hypothesis that neudesin plasmatic levels may be affected in obese and overweight children. We also

evaluated any eventual relationship between neudesin and metabolic and anthropometric parameters to gain insight on a possible role in childhood obesity.

34 children were included in the study and divided in two groups according to Cole's criteria. Group A included obese and overweight children, 23 patients, 17 females (Tanner stage 1) and 6 males, aged 4-10 years; Group B included normal-weight children, 11 patients, 7 females (Tanner stage 1) and 4 males, aged 3-10 years. Metabolic (glucose and insulin, total - LDL - HDL-cholesterol, triglycerides, uric acid) and hormonal (fT3, fT4, TSH, IGF-1, leptin) parameters were evaluated. HOMA index, QUICKI index and the area under the curve (AUC) of glucose and insulin after oral glucose load were calculated in obese and overweight children. Neudesin was measured by ELISA system.

Neudesin levels did not significantly differ between the two groups, even though a trend toward higher levels in group A was found (mean \pm SEM 3 \pm 0.32 ng/ml vs 1.98 \pm 0.15 ng/ml, $p = 0.1$). As expected, obese and overweight children showed significantly higher blood glucose, total and LDL cholesterol, triglycerides and leptin levels than those with normal weight. Interestingly, in obese and overweight children plasmatic neudesin levels significantly directly correlated with blood glucose and AUC of glucose. No other new significant correlation was detected in both groups.

Very few data on serum neudesin levels in human are available. To note, neudesin was lower in obese adolescents compared to age-matched normal controls (1), while children affected by type 1 diabetes mellitus showed higher levels than age-matched controls (2). Taken together, these results, although preliminary, may suggest a possible age-related role of neudesin in glucose homeostasis in obese/overweight children. **References:** 1. Celikkol A. et al, *J Clin Res Pediatr Endocrinol*, 2021 2. Polkowska A. et al, *Biomed Res Int*, 2019

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