United Nations Educational, Scientific and Cultural Organization

UNESCO Chair on Adolescent Health Care
National and Kapodistrian University of Athens
Greece

Serum spexin is correlated with lipoprotein(a) and androgens in normal-weight, overweight and obese adolescent females

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Background: The Spexin gene is considered the most dysregulated in obese human fat with an almost complete absence of expression in obese human fat in comparison with non-obese fat tissues. Limited data from human and animal studies suggest that the novel peptide spexin may potentially impact food intake, weight regulation and body adiposity.

Objective: The aim of this study was to compare serum spexin concentrations between normal-weight and overweight/obese adolescent females and explore possible relationships between circulating spexin and anthropometric, hormonal, metabolic, bone and body composition parameters.

Methods: Study participants included adolescent females, aged 12-18 years, who presented to the Centre for Adolescent Medicine and UNESCO Chair on Adolescent Health Care, from May 2016 to June 2018. Exclusion criteria included severe comorbidity, chronic medication, contraceptive use and pregnancy. Adolescents underwent evaluation of their anthropometric, metabolic and hormonal parameters as well asassessment of their bone mineral density and body composition with the use of dual-energy x-ray absorptiometry. Serum spexin concentrations were measured by ELISA using the Spexin (Human) EIA Kit of Phoenix Pharmaceuticals (USA) with analytical sensitivity of 0.08 ng/ml. Comparisons of continuous data were carried out with the use of student t-test or Mann-Whitney U test for non-parametric data. Pearson or Spearman's rho correlation coefficients identified correlations between continuous variables. The International Obesity Task Force cut-offs for body mass index (BMI) were used to categorize adolescents into normal-weight, overweight and obese.

Results: A total of 80 adolescent girls aged (mean±SD) 16.23±2.26 years; 55 normal weight females (mean age±SD, 16.69±2.22 years; mean BMI±SD, 19.72±2.52 kg/m^2), 25 obese and overweight females (mean age±SD, 15.17±2.01 years; mean BMI±SD, 29.35±3.89 kg/m^2), participated in the study (p=0.005 and p<0.001 respectively). No significant differences (p=0.378) were observed in serum spexin concentrations between normal-weight and obese/overweight adolescents **(Graph 1)**. Circulating spexin levels were not correlated with BMI or body fat percentage. In the total sample, serum spexin concentrations were correlated with Lp(a) (r_s = 0.402, p=0.046). In the obese/overweight adolescents, serum spexin concentrations were correlated with total testosterone (r_s = 0.727, p=0.011) and free androgen index (r_s = 0.755, p=0.007), whereas in the normal-weight participants spexin levels were correlated with dehydroepiandrosterone sulphate (DHEA-S) (r_s = -0.445, p=0.038).

Conclusion: The proposed role of spexin in adolescent females needs to be further investigated in large study samples.

Graph 1

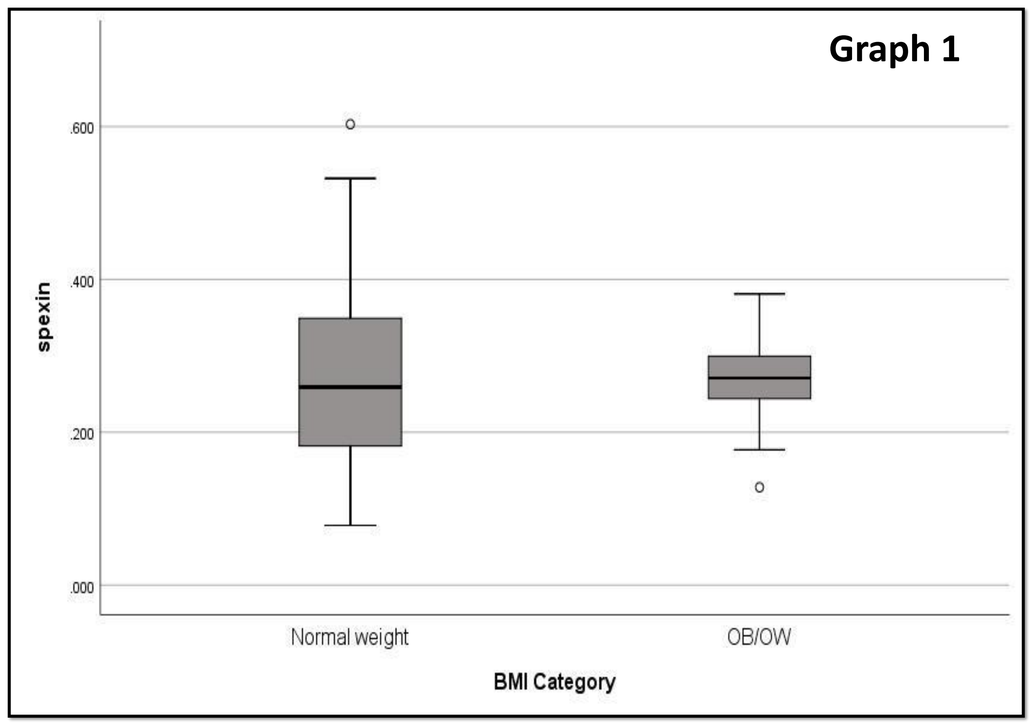

Table 1. Spearman rho correlation coefficients between circulating spexin and study sample characteristics

	Total sample	Obese/ Overweight	Normal weight
Testosterone (ng/ml)	-0.016	**0.727***	-0.147
DHEA-S (μg/dl)	-0.212	0.143	**-0.445***
FAI	0.081	**0.755****	-0.105
Lp(a) (mg/dl)	**0.402***	0.465	0.278

DHEA-S: dehydroepiandrosterone sulfate; FAI: free androgen index; Lp(a): lipoprotein(a).
***p<0.001, **p<0.01, *p<0.05.

Declarations of interest: none

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58ESPE P3-275
Fat, metabolism and obesity
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Poster presented at: ESPE 2019 VIENNA
PosterSessionOnline.com