

Serum Spexin Concentrations in Adolescent Females with Metabolic Syndrome, Polycystic Ovary Syndrome and Anorexia Nervosa

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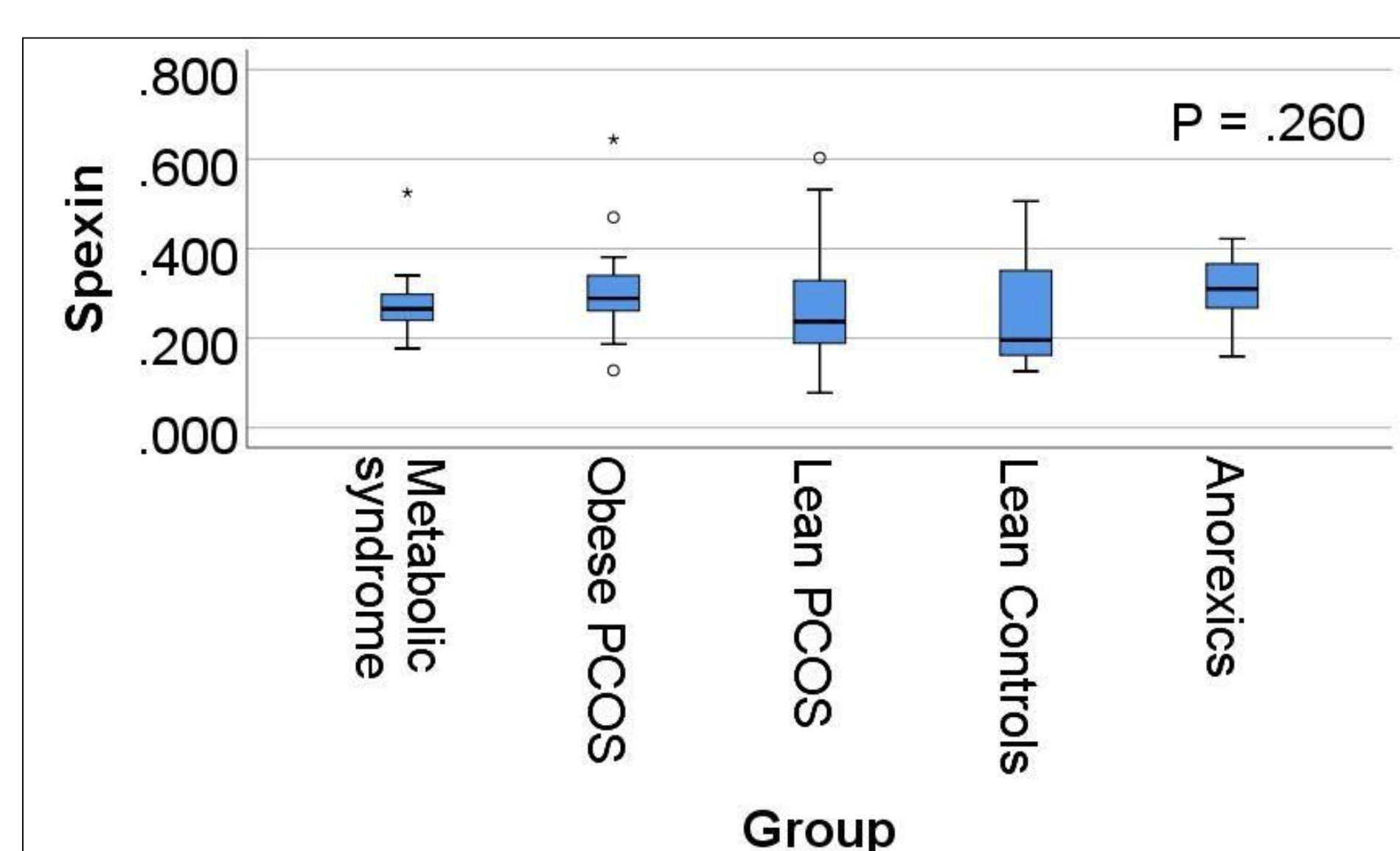
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Introduction and Objectives: Spexin is a novel hormone with an almost complete absence of expression in obese human fat in comparison with non-obese fat tissues. Limited data from human and animal studies suggest that spexin may potentially impact food intake, weight regulation and body adiposity. Circulating spexin has been associated with obesity and insulin resistance indices in women. The aim of this study was to determine serum spexin concentrations in adolescent females with metabolic syndrome, with polycystic ovary syndrome (PCOS), with anorexia nervosa as well as in healthy controls, and explore possible relationships between circulating levels of spexin and body mass index (BMI).

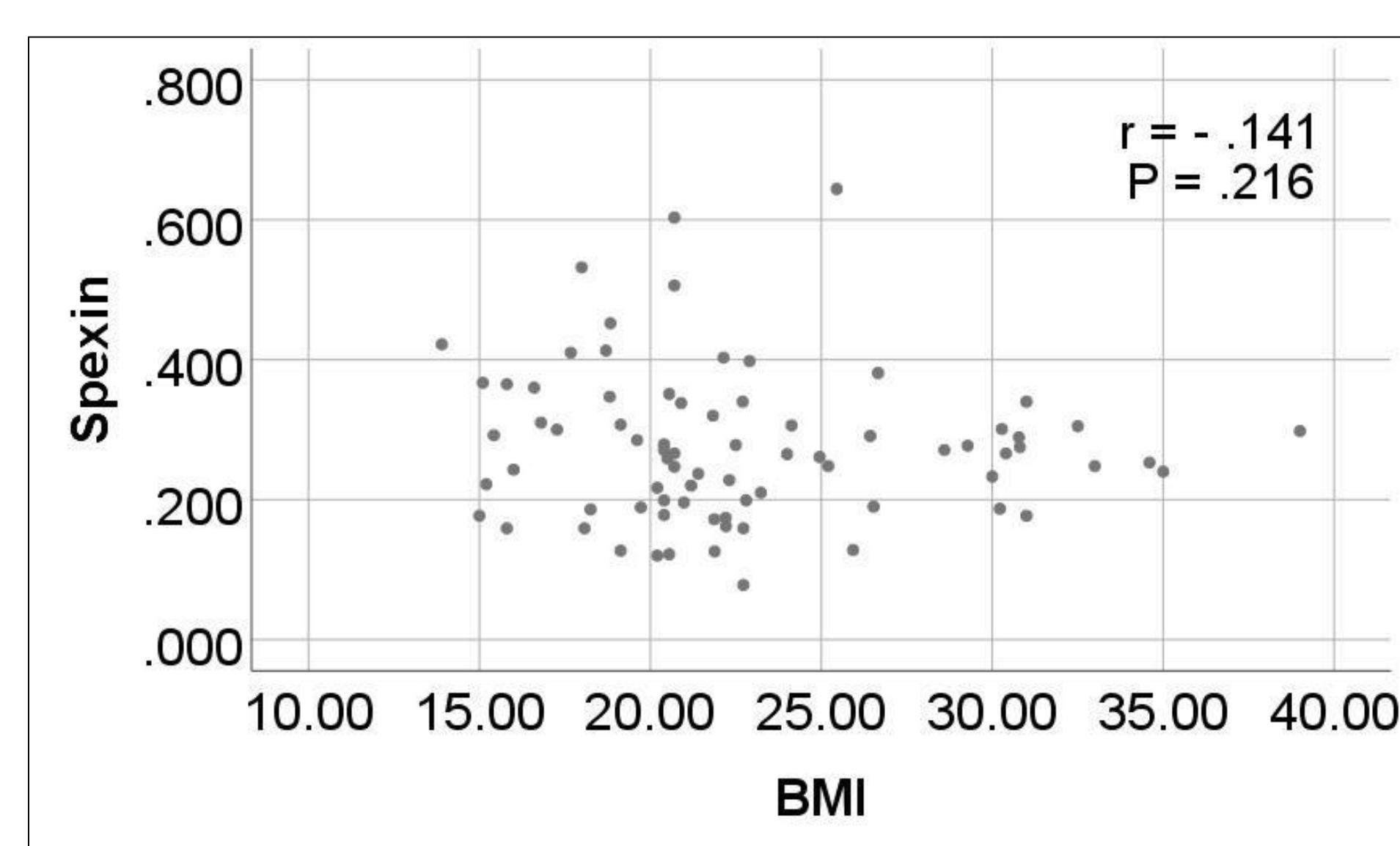
Methods: Study participants included adolescent females, aged 12-21 years, diagnosed with metabolic syndrome according to the International Diabetes Federation criteria, with PCOS according to the Rotterdam criteria, with anorexia nervosa according to the DSM-5 criteria, as well as healthy controls, who presented to the Centre for Adolescent Medicine and UNESCO Chair on Adolescent Health Care of the First Department of Pediatrics, from January 2015 to May 2017. Exclusion criteria included severe comorbidity, chronic medication, contraceptive use and pregnancy. 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. Kruskal-Wallis test and Spearman's rho correlation were used for the statistical analyses.

Results and Conclusion: A total of 82 adolescent girls aged (mean±SD) 16.2±2.2 years; 14 females with metabolic syndrome (mean age±SD, 14.9±1.9 years; mean BMI±SD, 29.1±6.7 kg/m²), 17 obese females with PCOS (mean age±SD, 15.4±2.0 years; mean BMI±SD, 26.7±3.3 kg/m²), 23 lean females with PCOS (mean age±SD, 16.9±2.1 years; mean BMI±SD, 21.1±1.4 kg/m²), 11 anorexic females (mean age±SD, 15.0±1.5 years; mean BMI±SD, 15.9±1.0 kg/m²) and 17 controls (mean age±SD, 17.7±2.2 years; mean BMI±SD, 19.9±1.5 kg/m²), participated in the study.

No significant differences ($p=0.260$) were observed in serum spexin concentrations among adolescents with metabolic syndrome, obese adolescents with PCOS, lean adolescents with PCOS, adolescents with anorexia nervosa and controls (**Graph 1**). Serum spexin levels were not correlated with BMI ($r_s = -0.141$, $p=0.216$) (**Graph 2**).



Graph 1



Graph 2

Results suggest that circulating levels of spexin cannot discriminate adolescent females with metabolic syndrome, PCOS or anorexia nervosa and across a wide range of BMI. These findings need to be confirmed in larger adolescent populations.

References

- Kołodziejcki PA, Pruszyńska-oszmałek E, Korek E, Sassek M, Szczepankiewicz D, Kaczmarek P, Nogowski L, Maćkowiak P, Nowak KW, Krauss H, Strowski MZ. Serum Levels of Spexin and Kisspeptin Negatively Correlate With Obesity and Insulin Resistance in Women. *Physiol. Res.* 2018;67: 45-56
- Hodges SK, Teague AM, Dasari PS, Short KR. Effect of obesity and type 2 diabetes, and glucose ingestion on circulating spexin concentration in adolescents. *Pediatric Diabetes.* 2017;1-5
- Kumar S, Hossain J, Nader N, Aguirre R, Sriram S, Balagopal PB. Decreased circulating levels of spexin in obese children. *J Clin Endocrinol Metabol.* 2016;101:2931-2936
- Gu L, Ma Y, Gu M, Zhang Y, Yan S, Li N, Wang Y, Ding X, Yin J, Fan N, Peng Y: Spexin peptide is expressed in human endocrine and epithelial tissues and reduced after glucose load in type 2 diabetes. *Peptides.* 2015;71: 232-239

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