

Correlation of serum chemerin concentrations with obesity/metabolic syndrome characteristics in pre-adolescents and adolescents

Flora Bacopoulou^a, Arsinoi Koutroumpa^b, Vasiliki Zoi^c, Eleni Karatza^c, Vangelis Karalis^c, Sophia Markantonis^c & Tania Siahaidou^b

^a Center for Adolescent Medicine and UNESCO Chair on Adolescent Health Care, First Department of Pediatrics, Medical School, National and Kapodistrian University of Athens, Athens, Greece

^b Neonatal Unit, First Department of Pediatrics, School of Medicine, National and Kapodistrian University of Athens, Aghia Sophia Children's Hospital, Athens, Greece

^c Department of Pharmacy, School of Health Sciences, National and Kapodistrian University of Athens, Athens, Greece

Background: Chemerin, a protein mainly synthesized in the adipose tissue and liver, belongs to the adipokines family and is implicated in signaling for adipocyte differentiation and lipolysis. From this point of view, chemerin can exert an important role in the regulation of various pathophysiological functions, including lipogenesis and metabolism.

Objective: The aim of this study was to investigate the relationship between chemerin serum concentrations and several demographic (e.g., gestational age at birth, age, sex), anthropometric (e.g., weight, length and head circumference at birth), biochemical (e.g., serum creatinine, urea levels), bone mineral density and obesity/metabolic syndrome indices (e.g., BMI, serum glucose, triglycerides levels) in 74 pre-adolescents and adolescents 7-15 years old.

Methods: Statistical analysis was performed using R language and environment for statistical computing. Initially, Kolmogorov–Smirnov test and Shapiro–Wilk tests were used to test normality of the data, while Levene's test was used for heteroscedasticity. Correlations between continuous variables following normal distribution were assessed by Student's unpaired t-test and one-way ANOVA, whereas for categorical or ordinal variables and continuous variables not following normal distribution were assessed by Mann–Whitney U-test and Kruskal–Wallis. Post hoc tests were also applied to identify potential different groups. Chemerin data were analyzed both as continuous and as binary variables. A cut-off value of 1ng/ml (based on the distribution data) was used for the categorization. Univariate and multivariate logistic regression was further utilized when chemerin was treated as a binary variable. The predictability and discriminatory capacity of the models was assessed by receiver operator characteristic curve and its area under the curve. In all cases, statistical significance was set at the $P < 0.05$ level.

Figure 1.

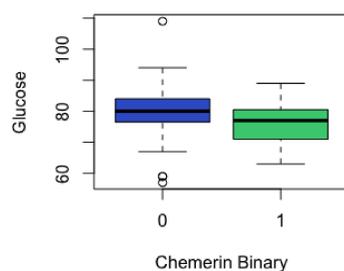
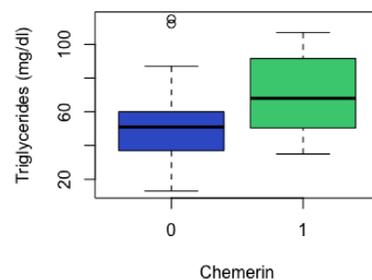
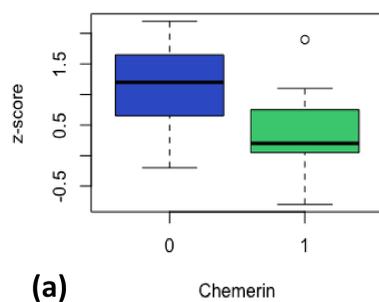
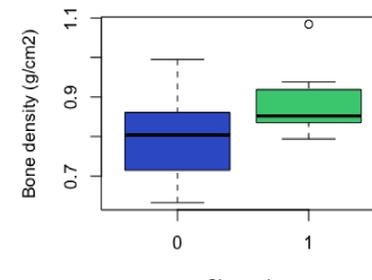


Figure 2.



(b)



(c)

Results: High/low chemerin levels were found to correlate with glucose concentrations, indicating that subjects with high chemerin levels >1ng/ml (Figure 1. group 1) had lower glucose concentrations. Boys with high chemerin levels (Figure 2a. group 1) had lower bone mineral density z-scores. Girls with high chemerin levels were taller, older, had higher creatinine and triglyceride levels (Figure 2b. group 1) and higher bone mineral density (Figure 2c. group 1). Several other trends were also found relating chemerin levels with Tanner stages for breasts in girls and genitals in boys.

Conclusion: Chemerin levels were found to significantly correlate with characteristics related to obesity/metabolic syndrome in pre-adolescence and adolescence.

Declarations of interest: none

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