

# Abstract

Epidemic of obesity is dangerous because of cardiometabolic health risks associated with it. The growing worldwide prevalence of obesity, even in pediatric population, goes hand in hand with efforts for finding new ways of treatment. Therapy with hormones of adipose tissue, adipokines, is one of the considered options. Chemerin and omentin are promising candidates for obesity treatment. Not many researches regarding adipokines and obese pediatric patients were published and the data from omentin researches are controversial.

The aim of this diploma thesis is investigation of chemerin and omentin level differences between slim and obese Czech adolescents. Additionally, if hormone levels of adipokines correlate with observed anthropometric and biochemical parameters. Next, if chemerin and omentin levels differ with respect to diagnostic methods of metabolic syndrome. In addition, if these hormone levels change depending on weight reduction.

Together 122 obese (BMI  $\geq$  97. percentile) and 162 slim (BMI 25.–75. percentile) girls and boys aged from 13,0 to 17,9 years were studied. Physical examination included basic clinical biochemical and anthropometric measurements. ELISA method for blood plasma examination was used for chemerin and omentin level investigation. Obese individuals underwent examination before and after a 4 week spa weight reduction therapy.

Investigations did not reveal any statistically significant difference of chemerin or omentin levels between obese and slim adolescents. Nevertheless the examinations showed a significant lowering of chemerin levels in case of obese adolescents after the weight reduction. A positive correlation of chemerin levels and anthropometric obesity parameters ( $p < 0,001$ ) were found for obese girls with index of insulin resistance (HOMA-IR) ( $p < 0,001$ ) and triacylglycerol level ( $p < 0,001$ ). Another positive correlation of chemerin and C-reactive protein (CRP) ( $p < 0,008$ ) in case of obese girls with diastolic blood pressure ( $p < 0,005$ ) and HOMA-IR ( $p < 0,007$ ) in case of obese boys did not fulfill statistical significance criteria after the Bonferroni correction. The omentin correlations, negative with HOMA-IR ( $p < 0,005$ ) for slim girls and positive with CRP ( $p < 0,007$ ) for slim boys, did not pass the Bonferroni correction.

**Keywords:** adipocyte, adipokines, chemerin, omentin, ELISA, metabolic syndrome, HOMA-IR, weight reduction