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Contribution of SNV *GLP1R* in Diseasome of Metabolically Unhealthy Obesity

Author/s:

Aleksandr Abaturov, Anna Nikulina, Dmytro Nikulin, Anastasiia Holikova, Daryna Dikhtyarenko

Organizations/Affiliations:

Dnipro State Medical University, Ukraine

Abstract

Background: A decrease in the level of GLP-1 reception, which is caused by single nucleotide variants (SNV) of the glucagon-like peptide-1 receptor (*GLP1R*) gene, can induce the development of obesity and metabolic disorders. **Aim:** to study the associations of the SNV *GLP1R* gene with pro-inflammatory cytokines and metabolic disorders in children with various obesity phenotypes.

Materials and Methods: 252 obese children aged 6-18 years were examined. The main group (n=152) was represented by children with metabolically unhealthy obesity (MUO). The control group (n=100) consolidated of children with metabolically healthy obesity (MHO). Whole genome sequencing (CeGat, Germany) was performed in 31 children of the main and 21 children of the control group.

Results: An association with the development of obesity was noted for T alleles rs61754624 (t=3.33) and rs10305457 (t=2.06); with MUO - for C alleles rs1042044 (t=2.23), rs1126476 (t=2.63), rs2235868 (t=2.82); T alleles rs61754624 (t=3.33), rs10305457 (t=2.06) *GLP1R*, $p<0.05$. In the MHO group, a correlation was found with the levels of pro-inflammatory markers IL-1β, IL-6 in the presence of the GA genotype SNV rs3765468; with hyperglycemia - GA genotype SNV rs6923761, CC genotype SNV rs1042044, AA rs6918287; hyperinsulinemia - GA genotype SNV rs3765468, GG rs10305421; triglyceridemia - AA rs6918287 of *GLP1R.*

Conclusions. SNV rs1042044, rs3765468, rs6923761, rs6918287 and rs10305421 *GLP1R* are associated with the development of MUO in individuals with MHO.

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Keywords: glucagon-like peptide-1 receptor, analysis of single nucleotide gene variants, children, metabolically unhealthy obesity, metabolically healthy obesity.