CRIMSON PUBLISHERS
Wings to the Research

Intervention in Obesity & Diabetes

ISSN 2578-0263

Editorial

Apolipoprotein A-V Genetic Variants in Obese Children

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Submission: February 26, 2018; **Published:** March 05, 2018

Editorial

Apolipoprotein A-V (APOA5) gene located on human 11q23 is an important determinant of plasma triglyceride levels [1]. Obese children with hyperinsulinemia had higher triglyceride (TG) level and lower APOA5 level than those without hyperinsulinemia and serum APOA5 was correlated negatively with TG level [2]. Single nucleotide polymorphisms (SNPs) of APOA5 were found to be significantly associated with plasma/serum TG levels in children [3-7]. SNP3 (ss3199915, now merged into rs662799) of APOA5 gene was found to play an important role in the variation of serum TG levels. The serum TG levels of the subjects with C allele were significantly higher than those of the subjects with the T/T genotype. The TG levels of the subjects with the T/C and C/C genotype were 12.7% and 31.8% higher than those of the subjects with the T/T genotype, respectively [3]. Horvatovich et al [4] examined four SNPs including T-1131C (rs662799), IVS3+G476A (rs2072560), T1259C (rs2266788) and C56G (rs3135506) of APOA5 and studied the frequencies of APOA5 haplotypes including APOA5*1 (TGTC), APOA5*2 (CACC), APOA5*3 (TGTG), APOA5∗4 (CGTC) and APOA5*5 (TGCC) in obese children [4]. The results indicated that the prevalence of the APOA5∗2 was about 2.59-fold increase while that of the APOA5∗5 displayed 3.88-fold decrease in obese subjects compared with healthy children. Accordingly, carrying APOA5∗2 and APOA5∗4 haplotype variants resulted in a significant increase in serum TG levels, while the APOA5∗5 haplotype had a serum TG level-decreasing. In Chinese child population, C carriers in rs662799 and rs651821 had 1.496-fold and 1.515-fold higher risk for developing obesity or overweight than those with T/T genotype. TG concentration was also significantly different among rs662799 variants [7]. SNP (rs778114184), the Arg282Ser missense mutation of APOA5 gene resulted in a significant reduction in serum APOA5 levels in heterozygous children and was associated with a significant reduction of TG levels in overweight/obese children [6]. Recently, a novel insertion polymorphism, c.*282-283 ins AG/c.*282-283 ins G-variant was identified in 3 UTR of APOA5 gene. And the presence of the AG insertion was associated with higher metabolic syndrome risk [5].

In summary, APOA5 is a regulator of serum TG. SNPs of APOA5 gene appear to be genetic risk factors for hypertriglyceridemia, and therefore increase obesity risk in children. The associations between variants in APOA5 gene and obese children need further study to improve the understanding of biological functions of APOA5 gene variants. In above studies, genotyping of SNPs was carried out using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) analysis [3,4], PCR-direct sequencing method [5], PCR-high resolution melting analysis [6] and MassArray [7]. Here, I recommend a method named base-quenched probe [8] which is now available for detecting multi-mutations simultaneously in one tube [9].

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How to cite this article: Guanghua L. Apolipoprotein A-V Genetic Variants in Obese Children. Interventions Obes Diabetes. 1(3). IOD.000511.2018. DOI: 10.31031/IOD.2018.01.000511