

# The effect of ABCA1 gene C69T single nucleotide polymorphism on dyslipidemia and insulin resistance in obese children

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**Introduction and objective:** ATP-binding cassette transporter A1 (ABCA1) mediates the transport of cholesterol and phospholipids from cells to lipid-poor apolipoproteins. It has been demonstrated that the ABCA1 gene C69T single nucleotide polymorphism (SNP) (TT genotype) is associated with lower high density lipoprotein (HDL) cholesterol and higher triglycerides (TG) levels. The relation of this polymorphism with Type 2 diabetes mellitus has been also shown. As dyslipidemia and insulin resistance are important characteristics of the metabolic syndrome (MS), we aimed to investigate the role of the C69T SNP of the ABCA1 gene on MS parameters in obese children.

**Methods:** A total of 284 obese children were enrolled to the study. Children were diagnosed as metabolic syndrome according to international diabetes federation definition. The frequencies of different genotype of the ABCA1 gene C69T SNP in simple obese and metabolic syndrome groups were investigated. The parameters of the dyslipidemia, insulin resistance and hypertension were compared according to different genotype of the ABCA1 gene.

**Results:** The 105 of the 284 obese children had MS (36.9%). There was no statistical difference between simple obese and MS groups regarding the frequencies of investigated SNP. However, children with TT genotype had lower HDL levels and higher HOMA-IR levels than CC genotype carriers. The demographic and laboratory features of the children with different genotypes of the ABCA1 gene C69T SNP were given at table 1.

**Conclusion:** Although the direct relation of ABCA1 gene C69T SNP with MS could not be demonstrated, it has been shown that the TT genotype worsens dyslipidemia and insulin resistance parameters in obese children.

Table 1. Demographic and laboratory features of obese children with different genotype for ABCA1 gene C69T SNP

	CC (n=128)	CT (n=121)	TT (n=35)	p
Age (years)	12.92±1.86	12.95±1.97	13.51±1.64	0.239
Gender (female/male)	80/48	61/60	26/9	0.021
BMI Z-score	2.11±0.34	2.21±0.30	2.17±0.23	0.037
Systolic blood pressure (mmHg)	128.54±19.09	128.72±17.42	132.35±20.67	0.549
Diastolic blood pressure (mmHg)	80.10±10.29	78.82±10.09	82.22±9.05	0.193
Glucose (mg/dl)	92.19±7.73	92.62±7.67	93.25±7.14	0.750
Insulin (U/L)	24.59±14.98	26.75±15.78	33.06±20.89	0.024
HOMA-IR	<b>5.63±3.79</b>	<b>6.24±4.09</b>	<b>7.67±5.29</b>	<b>0.037</b>
Total Cholesterol (mg/dl)	161.78±31.69	163.65±31.38	165.71±40.10	0.794
Triglycerides (mg/dl)	121.27±73.23	123.51±61.90	124.58±59.45	0.951
LDL-cholesterol (mg/dl)	104.35±24.36	103.89±30.93	104.13±44.66	0.993
HDL-cholesterol (mg/dl)	<b>45.35±9.50</b>	<b>44.56±9.87</b>	<b>40.51±9.11</b>	<b>0.031</b>
Frequency of metabolic syndrome	45/128 (35.1%)	46/121 (38.0%)	14/35 (40%)	0.829

BMI: Body mass index, HOMA-IR: Homeostatic model assessment of insulin resistance, LDL: low density lipoprotein, HDL: high density lipoprotein

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