Original article

UDC: 575.2:615.27
doi: 10.5633/amm.2025.0303

IMPACT OF *ABCG2 421 C>A AND SLCO1B1 521T>C* GENE POLYMORPHISM ON THE CONTROL OF LIPID STATUS IN PATIENTS ON ATORVASTATIN AND ROSUVASTATIN TREATMENT

Maša Jović[1,2], Radmila Veličković-Radovanović[2,3], Miodrag Cekić[4], Stevan Vujić[1,2], Nikola Krstić[1,2], Aleksandra Catić-Đorđević[2], Nikola Stefanović[2]

Single nucleotide polymorphisms (SNPs) of SLCO1B1 gene (521T>C), encoding OATP1B1 transporter, and ABCG2 gene (421C>A), encoding BCRP transporter, may have impact on statin metabolism, consequently affecting their pharmacodynamic effects. This study aimed to examine the association between transporter gene polymorphisms and lipid status control in relation to the doses of statin administered. In addition, the serum activity levels of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were compared among carriers of different transporter genotypes. This cross-sectional pharmacogenetic study enrolled 102 patients with dyslipidemia who had been on atorvastatin or rosuvastatin treatment for more than 4 weeks. The values of lipid status parameters were collected from routine patient check-ups, and the transporter SNP was determined using the real-time PCR method. The frequencies of the mutant 521C and 421A alleles were 32.35% and 19.61%, respectively. Patients carrying the mutant A allele of ABCG2 421C>A, who were taking higher doses of atorvastatin, had significantly lower LDL-c than patients with the wild-type genotype. In addition, the presence of the variant 521C allele of the SLCO1B1 polymorphism resulted in better control of HDL-c in patients receiving higher doses of rosuvastatin. The obtained results did not show an association between AST and ALT activity and the examined SNPs. Our study demonstrates that the presence of the examined SNPs may be linked to the regulation of specific lipid parameters. Further research with a larger cohort and blood drug concentration measurements of statins is needed to better understand the polymorphism-dose-effect relationship.

Acta Medica Medianae 2025;64(3): 24–33.

Key words: *atorvastatin, rosuvastatin, ABCG2, SLCO1B1, gene polymorphism, lipid status*