Prevalence of rs1695 and rs1138272 GSTP1 gene polymorphisms in a Southeastern European population sample compared to general European population frequency distributions.

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Introduction: Glutathione S-transferase P1 (GSTP1), is a member of the GSTs superfamily that protects the body from carcinogenic or genotoxic compounds. *GSTP1* polymorphisms may contribute to the development of several diseases, including asthma. The enzyme's activity can be affected by two SNPs (rs1695 and rs1138272) that lead to amino acid substitutions which alter its ability to respond to reactive oxygen and/or nitrogen species' (ROS/RNS) activity, the causal factor of many diseases.

Materials and Methods: A frequency distribution analysis of GSTP1 rs1695 and rs1138272 SNPs in a Southeastern European Caucasian (SEC) population sample was made and a comparison with other European (EUR) populations including Italian-Toscani (TSI), Finnish (FIN), British (GBR), Iberian (IBS) and residents of Utah with Northern and Western European ancestry (CEU) followed. (data obtained from ensembl.com).

DNA from buccal swabs of 943 healthy, non-related SEC volunteers was collected and analyzed by real-time PCR in LightCycler 480 platform (Roche, Germany) using appropriate LightSnip Assays (TIBMOLBIOL, Germany).

Results: The frequency of the wildtype A allele of rs1695, was 72.9% and that of the G allele was 27.1%. Out of the 943 SECs, 54.0% were homozygous for the wildtype genotype (A:A), 38.0% were heterozygous (A:G) and 8.0% were homozygous for the G allele (G:G). Additionally, G allele appeared 1.3 times more in Europeans than in SECs (OR=1.3314, p=0.0007). Regarding rs1138272, 88.8% were homozygous for the wildtype genotype (C:C), 10.7% were heterozygous (C:T) and only 0.5% were homozygous for the T allele (T:T). The frequency of the wildtype C allele was 94.1% and that of the T allele was only 5.9%. No further statistically significant differences in frequency distribution of these SNPs were observed between SECs and Europeans. Both polymorphisms were in Hardy-Weinberg equilibrium (x^2=1.64 for rs1695 and x^2=1.04 for rs1138272).

Discussion and Conclusion: As a phase II drug metabolizing enzyme, GSTP1 serves as a catalytic agent for GSH's conjugation to a variety of electrophilic substrates, an inactivating agent of a variety of antineoplastic and other drugs and an activator of antineoplastic prodrugs. Thus, *GSTP1* polymorphisms may be further investigated as pharmacotherapy biomarkers of various diseases.

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