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Analysis of chosen polymorphisms rs2476601 A/G - PTPN22, rs1990760 C/T - IFIH1, rs179247 A/G - TSHR in pathogenesis of autoimmune Thyroid diseases in children

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Introduction: Autoimmune Thyroid diseases are multi-factorial diseases with a genetic susceptibility and environmental factors. A potential role of the protein tyrosine phosphatase non-receptor type 22(PTPN22) gene, the interferon induced helicase domain 1 (IFIH1) gene, the Thyroid-stimulating hormone receptor (TSH-R) gene polymorphisms on autoimmune Thyroid diseases(AITDs) in children has not been established equivocally yet.

Aim: To estimate the association of polymorphisms of protein tyrosine phosphatase non-receptor type 22 genes, the interferon induced helicase domain 1 gene, Thyroid-stimulating hormone receptor gene with the predisposition to Graves' disease (GD) and Hashimoto's Thyroiditis (HT) in children.

Methods: The study was performed in 142 patients with GD, 57 with HT and 160 healthy volunteers. The three single nucleotide polymorphisms (SNPs): rs2476601 - PTPN22 in the protein tyrosine phosphatase non-receptor type 22 gene, rs1990760 - IFIH1 in the interferon induced helicase domain 1 gene, rs179247 - TSHR in the Thyroid-stimulating hormone receptor gene were genotyped by Taq-Man SNP genotyping assay using the real-time PCR. Furthermore, the interaction between rs1990760, rs2476601, rs179247 polymorphisms and the status of thyroglobulin antibody (TgAb), Thyroid peroxidase antibody (TPOAb) and TSH receptor antibody (TRAb) were analyzed.

Results: rs2476601: Our study revealed that rs2476601-A alleles were more frequent (18% in men and 20% in women) in GD patients in comparison to healthy subjects (11% in men and 10% in women). P-value=0.009 with OR=2.13 and 95% confidence interval for OR: 1.2–4.0, what means that risk for development of GD is over two times higher for A allele in comparison to G allele. Moreover rs2476601 A alleles were more frequent (25% in men and 21% in women) in HT patients in comparison to healthy subjects (11% in men and 10% in women). P-value=0.008 with OR=2.48 and 95% confidence interval for OR: 1.3–5.0, what means that risk for development of HT is two and a half times higher for A allele in comparison to G allele.

rs1990760: Rs1990760 T alleles were more frequent in GD male patients in comparison to healthy males (69% vs. 42%). P-value=0.003 with OR=3.00 and 95% confidence interval for OR: 1.5–6.2, what means that risk for development of GD is three times higher for T allele in comparison to C allele, when considering male group. In case of HT patients rs1990760 T alleles were also more frequent in males compared to healthy subjects (65% vs. 42%). P-value=0.086 with OR=2.47 and 95% confidence interval for OR: 0.9–7.5, what means that risk for development of HT is nearly two and a half times higher for T allele in comparison to C allele. Results for female group were non-significant from the statistical point of view, hence are not discussed here.

rs179247: Our study revealed that rs179247 A alleles were more frequent (47% both in men and women) in GD patients in comparison to healthy subjects (37% in men and 38% in women). P-value=0.039 with OR=1.51 and 95% confidence interval for OR: 1.0–2.3, what means that risk for development of GD is over two times higher for A allele in comparison to G allele.

Conclusions: rs2476601: A/G polymorphism in protein tyrosine phosphatase non-receptor type 22 gene could contribute to development of AITDs in children and A allele is the main risk factor. rs1990760: C/T polymorphism in the interferon induced helicase domain 1 gene could contribute to development of AITDs in children and T allele is the main risk factor. rs179247: A/G polymorphism in Thyroid-stimulating hormone receptor gene could contribute to development of AITDs in children and A allele is the main risk factor.

Biography

Artur Bossowski completed Doctorate in June 2001 and have already presented preliminary findings at various local and international meetings. He also started to performed investigation of lymphocyte subpopulations and co-stimulatory molecules and integrins in peripheral blood and in Thyroid tissues of patient with Graves' disease and non-toxic nodular goiter.

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