1 The role of gene variants of vascular endothelial growth factor in prostate carcinogenesis

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Introduction & Objectives: Angiogenesis is a biological process that involves the division and migration of endothelial cells and leads to the formation of microvasculature. Vascular endothelial growth factor (VEGF) is a major proangiogenic factor contributing to the stimulation of angiogenesis. The main objective of the study was to evaluate the association between the selected polymorphisms in the *VEGF* gene (-2578 A/C - rs699947; 18 bp I/D - rs144854329; -460 C/T - rs833061; -634 G/C - rs2010963 and +936 C/T - rs3025039) and the risk of prostate cancer development and progression.

Materials & Methods: The present study included 446 prostate cancer patients and 241 healthy men. Selected polymorphisms were detected by PCR-RFLP. Comparison of genotype distribution and association with selected clinical data were performed with the Chi-square test and Fisher's exact test.

Results: We found no statistically significant association between the individual selected polymorphisms of VEGF gene and the risk of prostate cancer development and progression in overall group of patients. We observed only association between the GC genotype of the *VEGF* -634 G/C polymorphism and increased risk of prostate cancer development with low grade (Gleason score ? 7) after stratification of patients. On the contrary, the CC genotype of the *VEGF* -634 G/C polymorphism was associated with development of high-grade carcinomas (Gleason score ≥ 8). The CC genotype was also associated with increased risk of prostate cancer development in group of patients with PSA ≥ 10 ng/ml compared to the control group as well as compared to the group of patients with PSA ? 10 ng/ml (p = 0.036). Based on the analysis of the combination of all observed polymorphisms, we found a statistically significant increased risk of prostate cancer development (p = 0.03) as well as low-grade carcinomas (Gleason score ? 7, p = 0.015) in a group of patients who had 9 or 10 risk allele.

Conclusions: The results of the study indicate that the *VEGF* -634 G/C polymorphism could affect the prognosis and aggressiveness of prostate cancer. We also found that the presence of 9 or 10 risk alleles of all combined polymorphisms may increase the risk of prostate cancer development as well as low-grade carcinomas (Gleason score ? 7).

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