The Association of SRD5A2 Gene Polymorphism at Codon 89 and Prostate Cancer Risk: Case Control Study

Introduction and Objective: Testosterone is essential for developing prostate cancer (PC), thus activity impairment of 5-alpha-reductase type II enzyme (encoded by the SRD5A2 gene) may be related to PC. We investigated the association between SRD5A2 polymorphism at codon 89 and the risk of PC.
Materials and Methods: In total, 281 patients (95 histologically proven PC, 79 BPH and 107 age-matched controls without suspicious affection of prostate) were included in the study. The polymorphism at codon 89 were analysed using PCR-RFLP method from blood samples with 3 resulting genotype variants val/val (VV),val/leu (VL) and leu/leu (LL). Descriptive statistics and chi-square tests were performed; relative risks and odds ratios were calculated for particular genotype variants.
Results: Genotypes VV, VL and LL were found in 41.6%, 50.5% and 7.8% study patients with significant difference in frequencies among particular groups (χ^2 test, p=0.021), but only due to unbalanced frequency of LL variant, which was very low in PC and BPH groups (3.2% and 5.1%) compared to 14% in control group. When LL variants were excluded from analysis and BPH was grouped with control, the VV and VL frequencies were similar (χ^2 test, p=0.154), with slightly higher rate of VL in PC (60.9%) compared to 51.5% in non-cancer group. The trend for lower risk of PC was observed with genotype VV compared to VL (RR=0.78; OR=0.683, 95%CI 0.407-1.145), but the association was not significant (p=0.148). The substantial difference in risk was observed when comparing VL and LL genotype (RR=2.90; OR=4.12, 95%CI 1.166-14.587) with significant association (p=0.028), but low number of LL variants in study cohort must be considered. In PC subgroup analysis, neither VV nor VL genotypes were significantly related to PSA and testosterone level and age at the time of diagnosis or to more risky prostate cancer (Gleason score ≥7).
Conclusions: Our findings suggest that SRD5A2 gene polymorphism at codon 89 does not have major impact on the development of prostate cancer. Although LL variant was associated with lower risk of PC, its frequency in our cohort was generally low. Trend for higher risk of PC associated with genotype VL was not statistically significant.