The Association of p53 Gene Polymorphism at Codon 72 and Prostate Cancer Risk: Case Control Study

Introduction and Objective: The tumour suppressor gene p53 is considered to play important role in the development of many human malignancies. Genetic changes in p53 gene can lead to production of malfunctioning protein. We investigated the association between p53 polymorphisms at codon 72 and the risk for development of prostate cancer.
Materials and Methods: In total 334 patients, 106 with histologically proven prostate cancer, 158 patients with BPH and 70 age-matched controls without any suspicious affection of prostate, were included in the study. The polymorphisms at codon 72 were analysed using PCR-RFLP method from blood samples with 3 resulting genotype variants arg/arg, arg/pro and pro/pro. Descriptive statistics and chi-square tests were performed; the associations between genotype variants and cancer/BPH were assessed by calculating the relative risks and odds ratios. A two-sided p value < 0.05 was considered statistically significant.
Results: Only 5 cases of pro/pro variant (all in BPH group) were detected in our cohort; therefore, they were excluded from further analysis. Thus 106 prostate cancer and 223 non-cancer patients remained for the final analysis. Genotype arg/arg was found in 45% of cancer and in 38% of non-cancer specimen without significant difference ($p=0.28$). There was also no significant difference between each of the 3 groups (similar proportion of both genotype variants in cancer, BPH and control groups with similar chi-square test results and no significant p values within range 0.25-0.77). The trend for higher risk of prostate cancer growth was observed with genotype arg/arg compared to arg/pro (RR=1.2; OR=1.32, 95% CI 0.83-2.10), but the association was not significant ($p=0.246$). In a prostate cancer subgroup analysis, neither arg/arg nor arg/pro genotypes were related to initial PSA level and age at the time of prostate cancer diagnosis or more risky prostate cancer (Gleason score <7, ≥ 7).
Conclusions: Our findings suggest that single p53 polymorphism at codon 72 does not influence the development of prostate cancer, as well as BPH. The observed positive trend for higher risk of prostate cancer with genotype arg/arg was not statistically significant.