Concomitance of oncogenic HPV types, *CHEK2* gene mutations, and *CYP1B1* gene polymorphism as an increased risk factor for malignancy.

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Introduction

Urinary bladder cancer in Poland is the fourth most frequent malignant cancer in men (6.1%) and the seventeenth in women (1.6%). The problems associated with cancer should be considered on two levels - prevention, implementation of prevention and early diagnosis. Prevention is possible in preclinical phase of cancer and concerns patients of high-risk groups. Therefore, the selection of such groups should be based only on the environmental factors of carcinogens, but also on the genetic predisposition to cancer growth promotion. The mutations /polymorphisms of the *CYP1B1* and *CHEK2* genes predispose to multiorgan tumors developement, and the Human Papilloma Virus (HPV) may be involved in the neoplastic transformation of bladder cancer as an environmental factor.

Material and methods

The study included 131 patients with clinically and histopathologically diagnosed bladder cancer with different clinical stage. Mutations in *CHEK2* gene (IVS2 + 1G> A, 1100delC, I157T) were detected by multiplexPCR and the *CYP1B1* gene polymorphism (355T/T) was detected by RFLP-PCR assay, using DNA isolated directly from the tumor and peripheral blood. The evaluation of the 37 genotypes of HPV in DNA isolated from tumor was performed using PCR-ELISA assay.

Results

11 mutations of *CHEK2* gene were identified, the 355T/T polymorphism of *CYP1B1* gene occurred in 18 cases (12.9%). In 36 cases out of 123 examined (29.3%) showed the presence of oncogenic HPV type.

Conclusions

The concomitance of *CHEK2* gene mutations or the 355T/T polymorphism of *CYP1B1* gene and the presence of oncogenic types of HPV statistically significantly correlated with the histological grade of bladder tumor.

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