

### **GSTM1, GSTT1 and GSTP1 Genetic Variants in Multiple Urologic Cancers**

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#### **Abstract**

*Introduction:* Glutathione S-transferases (GSTs) are phase 2 enzymes responsible for catalyzing the biotransformation of a wide variety of electrophilic compounds, having a crucial role in the detoxification of active metabolites of procarcinogens produced by phase 1 reactions, tying them to glutathione and promoting their excretion in the urine.

*Objectives:* we evaluated GSTM1, GSTT1 and GSTP1 genotypes in patients diagnosed with multiple malignancies, of which at least one was found in the prostate, bladder or kidney.

*Materials and methods:* GSTM1, GSTT1 and GSTP1 genotypes were genetically assessed in 34 patients with multiple urologic cancers and 23 patients with urologic cancer associated with another type of cancer.

*Results:* in the group of patients with multiple urologic cancers, GSTT1 null genotype was found in 26.4% of patients compared to 0% in controls, 82.35 % of patients and 47% of witnesses carried at least one GSTM1 or GSTT1 null genotype, and in the group with different cancers, GSTM1 null genotype was found in 52.1% of patients compared to 4.3% witnesses in the control group; GSTT1 null genotype was found in 34.7% of patients compared to 4.3% of witnesses, at least one GSTM1 or GSTT1 null genotype was found in 73.9% of patients compared to 8.6% of controls.

*Conclusions:* GSTT1 null genotype is a risk factor for patients with more primitive urologic malignancies (bladder, prostate and kidney); GSTM1 or GSTT1 null genotype is more frequent in patients with multiple urologic tumors; GSTM1 and GSTT1 null genotypes are risk factors in patients with different types of cancer, with at least one affecting the urinary system.

**Key words:** multiple cancers, urologic cancers, GSTM1, GSTT1, GSTP1

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