DETERMINATION OF EXPRESSION OF COX-2 AND MMP-7 GENES AMOUNG PATIENTS WITH GASTRIC CANCER

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In this research, we have studied the expression of genes COX-2 and MMP-7 in tumor and abdominal tissues of patients suffering GC to determine the course of the disease.

Keywords: gastric cancer, expression, matrilysin, cyclooxygenase, molecular genetic studies, polymerase chain reaction.

Today, gastric cancer (GC) is the fourth largest oncological pathology in the world, after lung cancer, breast cancer and colon cancer. GC annually affects about 1 million people [1].

MMP-7 (matrilysin) is the matrix of metalloproteinase. It initiates epithelial-mesenchymal transfer, which leads to distant metastases. Feature of MMP-7 is that it is presented in the form of tumor cells and involved in cancer development, from its early stages [2].

COX-2 (cyclooxygenase) activated under certain circumstances, for example, with inflammation. It is introduced by macrophages, fibroblasts, smooth vascular musculature, and endothelial cells [3].

The research is based on data research from 79 patients with gastric cancer, treated at the Belarussian research center of N.N. Alexandrova during the course of 2013–2016. The study of the genes expression of MMP-7 and COX-2 was performed by using a polymerase chain reaction (PCR) in real time, using the amplifier Bio-Rad iQ5 (USA), using a set of reagents "Maxima Hot Start DNA polymerase kit" (Fermentas, Lithuania). DNA extraction was performed by reverse transcription, using a set of reagents "miRNease Mini Kit" manufactured by Qiagen (Germany).

In the course of this study,the analysis of the COX-2 in the abdominal tissue and the tumor tissue among patients suffering from gastric cancer was carried out. The baseline is the gene expression of COX-2 is set to (0,049–20,17 relative units) identified from normal tissue. As a result of molecular-genetic studies of abdominal tissue among patients with gastric cancer, it was discovered that in 27 (34,2 %) cases, the expression level of the COX-2 gene exceeded the baseline level. it has been noticed that 16 (20,2 %) patients had the level of expression below the baseline. 36 (45,6 %) patients had the expression of this gene within the baseline value. In the study group, 10 (12,6 %) patients has COX-2 gene expression level in tumor tissue was above baseline, in 9 (11,4 %) cases below the baseline level, and 60 (76 %) patients with detected stomach cancer the expression value of the COX-2 gene within the baseline.

Patients suffering from gastric cancer had an analysis of the expression of the MMP-7 gene in abdominal tissue and tumor tissue. When analyzing the obtained data in the expression of this gene in the baseline level in abdominal tissue and tumor tissue the value (0,04 to 24,6 relative units), was detected for normal tissue. In the abdominal tissue it was discovered that 25 (31,6 %) patients had the level of gene expression exceeded the base value of MMP-7 gene expression, 4 (5,1 %) cases had the expression below the baseline, 50 (63,3 %) patients' level depending on the baseline value. In a tumor tissue 10 (12,6 %) patients had the level of gene expression exceeded to the baseline level, 8 (10,1 %) patients had the expression below the baseline, 61 (77,3 %) patients with detected gastric cancer had the expression within the baseline level.

Thus, according to this data analysis, the gene expression of COX-2 and MMP-7 in abdominal tissue and tumor tissues found that the expression of the gene COX-2, is detected 2,3 times more often, and gene MMP-7 – 1,6 times in the abdominal tissue than the tumor tissue, that may indicate a high proliferative activity of tissues among patients with GC, the prevalence of the tumor process and the bad prognosis of the disease.

BIBLIOGRAPHY

1. *Аксель Е. М.* Смертность населения России и стран СНГ от злокачественных новообразований в 2014 – РОНЦ им. Н.Н. БлохинаРАМН. – 2015. – С. 8.

2. *Joo Y. E.*Cyclooxygenase-2 expression is associated with well-differentiated and intestinaltype pathways in gastric carcinogenesis / Y.E Joo[et al.]. // Digestion. –2002. – Vol. 66. – P. 222–229.

3. Coussens L.M.Matrix metalloproteinase inhibitors and cancer: trials and tribulations / L. M. Coussens [et al.] // Science. – 2002. – P. 2387–2392.