Summary

Chemokines are low molecular chemotactic proteins, binding to G protein-coupled receptors. These cytokines play a significant role not only in numerous physiological processes, but also in many pathological conditions. It has been suggested that chemokines and their receptors are involved in the pathogenesis of several malignancies, including gastric cancer (GC).

Gastric cancer is the fifth most common cancer and the third most common cause of death among malignant tumors in the world. Because of a late diagnosis of GC patients and their short survival after the diagnosis, the earlier detection of GC and initiation of appropriate treatment are important. The significance of CXCL8 and its specific receptor CXCR2 in the development of GC has been suggested. Increased expression of CXCR2 in GC tissues correlated with the presence of distant metastases. The significance of CXCL8 and its receptor CXCR2 in GC has not yet been compared with the classical tumor markers i.e., CEA and CA 19-9 and a marker of inflammation – CRP.

The aims of this study were:

1. The assessment of CXCL8 and CXCR2 concentrations in the blood of GC patients and then the comparison of these concentrations with the control group.
2. The analysis of association between serum CXCL8 and CXCR2 concentrations and tumor stage as well as clinico-pathological features of GC.
3. The comparison of serum CXCL8 and CXCR2 levels with CEA and CA 19-9 and with CRP concentrations in GC patients.
4. The assessment of a logistic regression analysis to determine the relationship between the concentrations of CXCL8, CXCR2, CA 19-9, CEA, CRP markers and the probability of GC development.
5. The evaluation of diagnostic criteria, such as diagnostic sensitivity and specificity, positive and negative predictive values, as well as the area under the ROC curve for CXCL8 and CXCR2.

The material for the study was venous blood serum collected before treatment. CXCL8 and CXCR2 concentrations were determined by ELISA immunoenzymatic method, CEA and CA 19-9 concentrations by chemiluminescence method, and CRP by turbidimetric method. Differences in concentrations of the determined proteins were subjected to statistical analysis.

Serum CXCL8 and CXCR2 levels were significantly higher in GC patients than in the healthy controls, similarly to CA 19-9 and CRP. CXCL8 concentrations correlated significantly with CXCR2, CA 19-9 and CRP concentrations, while concentrations of CXCR2 correlated with CRP concentrations. The diagnostic sensitivity of CXCL8 was higher for CXCL8 than for CXCR2 and CEA and comparable to CRP and CA 19-9. The combined measurements of CXCL8 with the classic tumor marker CA 19-9 and CXCR2 with CA 19-9 increased the diagnostic sensitivity.

CXCL8 concentrations were found to have the highest diagnostic significance in the diagnosis of GC basing on the ROC area analysis among all analyzed proteins. Elevated CXCL8 concentration seems to be a significant, independent factor of GC.

Our studies suggest the involvement of CXCL8 chemokine and its specific receptor in the development of GC, as well as in GC progression. In comparison with classical tumor markers, higher diagnostic significance of CXCL8 concentrations reveals this chemokine as a solid candidate for a GC marker, especially combined with CA 19-9.