Summary

The aim of this study was an examination of the serum concentration of ten cytokines in renal cell carcinoma patients (C64). The following cytokines were observed: angiogenin, MCP-1 (CCL2), GRO alfa (CXCL1), interleukin-8 (CXCL8), ENA-78 (CXCL5), endoglin (CD105), interleukin-6, TGF-beta1, VEGF a bFGF. The first objective was to measure the serum concentrations of the cytokines before the commencement of therapy. The second objective was to examine the development of the cytokines' serum concentrations, depending on surgery, the healing of postoperative wound and subsequent course of the disease. Patients were divided into three groups according to clinical stage of the disease in order to examine the influence of the size of the tumor on cytokine serum levels. Finally, we evaluated clinical data, such as age, gender, grading of the tumor, presence of the tumor duplicity, progression of the disease and the death of patient.

The effect of the tumor presence on the serum levels of the cytokines was assessed in the first sample, which was collected before surgery. The acquired values were compared with others gained from healthy blood donors. Statistically significant differences, in comparison with the group of healthy blood donors, were found in the following cytokines: an increase of serum concentrations was observed in angiogenin (in the first group of patients), in ENA-78 (in the first group of patients), in interleukin-6 (in the first, second and third group of patients), in VEGF (in the third group of patients). By contrast, a decrease of serum concentrations was observed in interleukin-8 (in the first, second and third group of patients), in endoglin (in the first and second group, the third group reached a statistical borderline) and in TGF-beta1 (the second and third group of patients reached a statistical borderline).

The postoperative development of the cytokine levels was assessed in the following four samples, which were collected one week, 3 months, 6 months and 12 months after surgery. The comparison of the serum concentrations of cytokines during the experiment was only possible in the first group of patients, because there was not a sufficient number of samples in the second and third group of patients. Statistically significant differences were observed in only 3 cytokines. A statistically significant increase in the second sample (one week after surgery) was observed in comparison with the preoperative level in GRO alfa and interleukin-6. In bFGF a significant increase in the second sample was found as well as a significant decrease in the fourth and fifth samples in comparison with the first.

Aside from these significant differences, certain trends of development of serum levels were seen in practically all other cytokines (angiogenin, MCP-1, ENA-78, endoglin, TGF-beta1, VEGF), in all groups.

In comparing cytokine serum concentrations among groups of patients, we wanted to detect the relationship between the size of the prime tumor and the cytokine level. Statistically significant differences were found mainly between the first and the third group of patients. MCP-1, GRO alfa and VEGF were statistically significantly increased in the fifth sample, interleukin-6, interleukin-8, VEGF and bFGF in the first sample and interleukin-8 also in the second sample; all in the third group in comparison with the first group. A statistically significant increase of VEGF was seen in sample 1 in the third group in comparison with the second group. A decreased level of ENA-78 was found in the fourth sample of the third group in comparison with the first group.

According to our observations, the latter stages of renal cell carcinoma may be connected with higher levels of MCP-1, GRO alfa, VEGF, IL-6, IL-8, bFGF.

The clinical data was evaluated in relation to clinical stages of the disease. Additionally, a selection of data (progression of the disease, the death of patients and histopathological grading of the tumor) was evaluated also in relation to some laboratory data. In age, gender and tumor duplicity we did not prove any difference amongst groups of patients. However, we did find significant differences in the progression and death rates between the first and third group and between the second and third group. The first and the third group of patients also displayed various grades of the histopathological grading.

In order to compare clinical and laboratory data we chose only those which differed among the groups of patients – progression of the disease, the death, histopathological grading, MCP-1, GRO alfa, interleukinu-8, ENA-78, interleukinu-6, VEGF and bFGF. The patients, who showed a progression of the disease, had higher preoperative levels of GRO alfa, IL-8, IL-6, VEGF and bFGF. The patients, who died, had higher preoperative levels of GRO alfa, IL-6 and VEGF. The fourth grade of histopathological grading was connected with higher levels of GRO alfa (in comparison with the first, second and third grade) and IL-6 (in comparison with the first and second grade). The third grade of histopathological grading was connected with a lower level of ENA-78 (in comparison with the second grade).

The obtained statistically significant differences must be interpreted very carefully. The relatively low number of evaluated samples and the subsequent choice of weaker nonparametric statistical tests make generalization difficult. A far greater number of patients would be required for a more statistically accurate confirmation of our results.