SUMMARY

Angiogenesis represents an essential step in tumour proliferation, expansion, and metastasis. Renal cell carcinoma (RCC) is known to be a well-vascularized tumour. The angiogenic response, also known as the „angiogenic switch", is initiated when the balance between the positive and the negative regulators of angiogenesis is disrupted in favor of the proangiogenic factors. Angiogenesis is regulated by numerous angiogenic and anti-angiogenic factors. Hypoxia is a crucial stimulus for angiogenesis. For many cancers, the extent of vascularisation is a negative prognostic indicator associated with aggressive cancer proliferation and increased risk of development of distant metastasis.

We identified serum levels of angiogenin, MCP-1, RANTES, GRO, ENA-78, IL-8, PDGF, IL-6, EGF, TIMP-1, TIMP-2 and leptin in serum of 32 patients with RCC, and 14 healthy volunteers by means of protein array analysis. The patients were divided into three groups according to their disease stages (I+II, III, and IV). We discovered significant differences between the donors and patients with RCC. The pre-operative levels of angiogenin, ENA-78 and panGRO were higher in patients of all stages of RCC. The other angiogenic factors such as PDGF, MCP-1, TIMP1, TIMP2, RANTES and EGF were significantly lower in patients with stage IV (with distant metastases) compared to patients with RCC stages I-III (without distant metastases).

IL-6 did not show any significant differences during the follow-up while IL-8 and leptin showed significant changes in serum levels during the study and correlated with tumour removal.

Multiplex protein array is a method which enables us to determine more than one parameter in one analysis. It seems that the serum levels of some angiogenic factors in patients with RCC can reflect the advanced stage of the disease.