Introduction and Aims: The most common histologic type of renal cell carcinoma (RCC) is clear renal cell carcinoma (cRCC), representing the most aggressive form of RCC. Recent studies found elevated urine concentrations of kidney injury molecule-1 (KIM-1) and aquaporin 1 (AQP-1) in patients with cRCC compared with controls and mark them as specific and sensitive early markers of disease. Our aim was to determine relationship between the urine concentration of kidney injury molecule-1 (KIM-1) and aquaporin-1 (AQP1) in patients with cRCC with tumor size, grade, pT stage and type of operation (radical or partial nephrectomy).

Methods: Urinary concentrations of KIM-1 and AQP-1 were determined preoperatively and postoperatively by commercially available ELISA kits. The analysis included 40 patients undergoing partial or radical nephrectomy for cRCC and 30 age-and sex-matched healthy adult volunteers.

Results: The median preoperative concentration of uKIM-1 in the cRCC group (0.9 ±1.84 ng/mgUcr) was significantly greater compared with the concentration in the control group of healthy subjects (0.23±0.15 ng/mgUcr) (p=0.0014). Postoperatively, uKIM-1 concentration decreased significantly and it was statistically indistinguishable from the concentration estimated in control group (0.17±0.1 ng/mgUcr vs. 0.23±0.15 ng/mgUcr). Size, grade and stage of tumor are correlated positively with preoperative uKIM-1 concentration. Contrary to these results, concentrations of uAQP-1 in cRCC group was significantly lower (0.11±0.09 ng/mgUcr) compared with group of healthy (0.18±0.16 ng/mgUcr) (p=0.031). Postoperatively, the concentration of uAQP-1 was progressively increasing and achieved approximately the same value as the group of healthy (0.2 ±0.2 ng/mgUcr vs. 0.18±0.16 ng/mgUcr). We did not find significant correlation between pre-operative uAQP-1 concentration and tumor size, grade and stage.

Conclusions: KIM-1 but not AQP-1 concentrations were significantly increased in pre-operative urine samples of patients with cRCC compared to a group of healthy subjects, indicating that determination of urinary KIM-1 could bring diagnostic benefit.