



Pilot study to assess the changes of NGAL molecule as a marker of warm ischemia after partial nephrectomy

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Introduction and Objective:

- The aim of the study is to assess the changes of neutrophil gelatinase-associated lipocalin (NGAL) level over time in patients undergoing partial nephrectomy in relation to warm ischemia time (WIT). We are aware that postoperative function of the kidney is complex and apart from WIT it may be influenced by other parameters as well, but WIT is a modifiable factor.

Materials and Methods:

- A pilot prospective study was done. Totally 19 patients (13 males, 6 females) undergoing a partial nephrectomy for renal tumor between 3/ 2015 -12/ 2016 were included. Median age was 66, median tumor size was 25mm. Median WIT was 16 min, ranging from 8 to 30 min.
- In every patient, serum creatinine level (crea) before surgery (crea_pre), 4 hours after surgery (crea_H4) and 3 days postoperatively (crea_D3) was measured.
- The level of NGAL in serum before surgery (NGAL_pre), 4 hours after surgery (NGAL_H4) and 3 days postoperatively (NGAL_D3) was assessed by ELISA.

Results:

- Median crea_pre: was 88 µmol/l, median crea_H4: 107 µmol/l, median crea_D3: 97 µmol/l.
- Median NGAL_pre: 147,7 ng/ml, median NGAL_H4: 212,1 ng/ml, median NGAL_D3: 163,2 ng/ml.
- We calculated the changes over time for creatinine and NGAL and analyzed the results in relationship to the WIT using nonparametric test.
- Results are summarized in the table.

Spearman's rho WIT	Crea_change H4	Crea_change H4_percent	Crea_change D3	Crea_change D3_percent	NGAL_change H4	NGAL_change H4_percent	NGAL_change D3	NGAL_change D3_percent
Correlation coefficient	0,605	0,497	0,063	0,097	0,022	-0,030	-0,603	-0,623
Significance (2-tailed)	0,006	0,03	0,797	0,694	0,929	0,903	0,006	0,004

Conclusion:

- There is a change in the level of NGAL over time in patients undergoing partial nephrectomy. On the 3rd day after surgery, this change shows a negative correlation with WIT and is statistically significant. The reason for the negative correlation is not clear and remains the subject of ongoing research.