

# IL-18 and NGAL in assessment of the risk of contrast-induced nephropathy in children.

**Katarzyna Jobs, Marianna Lichosik, Anna Jung**  
**Pediatric Nephrology Department**  
**Warsaw, Poland**



## INTRODUCTION

An access to diagnostic tests including numerous radiological examinations using contrast media is systematically growing in recent years. Despite the fact that the risk of contrast nephropathy in patients without risk factors is small, there is a fear that well established criterions are based on not very sensitive parameters.

## THE AIM

The aim of the study was to determine the usefulness of new biomarkers of acute renal injury: **IL-18** and **NGAL** in the risk assessment of contrast nephropathy in children with normal or slightly impaired renal function.

## MATERIAL AND METHOD

The study included patients among whom urography or CT scan with the use of intravascular contrast agent were performed. We examined 33 children aged 1.5 months to 17 years old (19 girls, 14 boys, age  $6.37 \pm 5.41$  years old). 20/33 (61%) of patients had hydronephrosis, 9/33 (27%) other urinary tract defects referred as "no hydronephrosis" (renal dysplasia, simple renal cyst, duplication of the ureter, posteriori urethral valves, nephrocalcinosis) and 4/33 (12%) urolithiasis.

Before radiological procedures with contrast agent serum creatinine, serum NGAL and IL-18 and urine NGAL and IL-18 were performed. 2-4 hours after contrast agent administration urine NGAL and IL-18 concentrations were measured. 48 hours after the use of intravenous contrast medium: serum creatinine, serum NGAL and IL-18, urine NGAL and IL-18 were assessed.

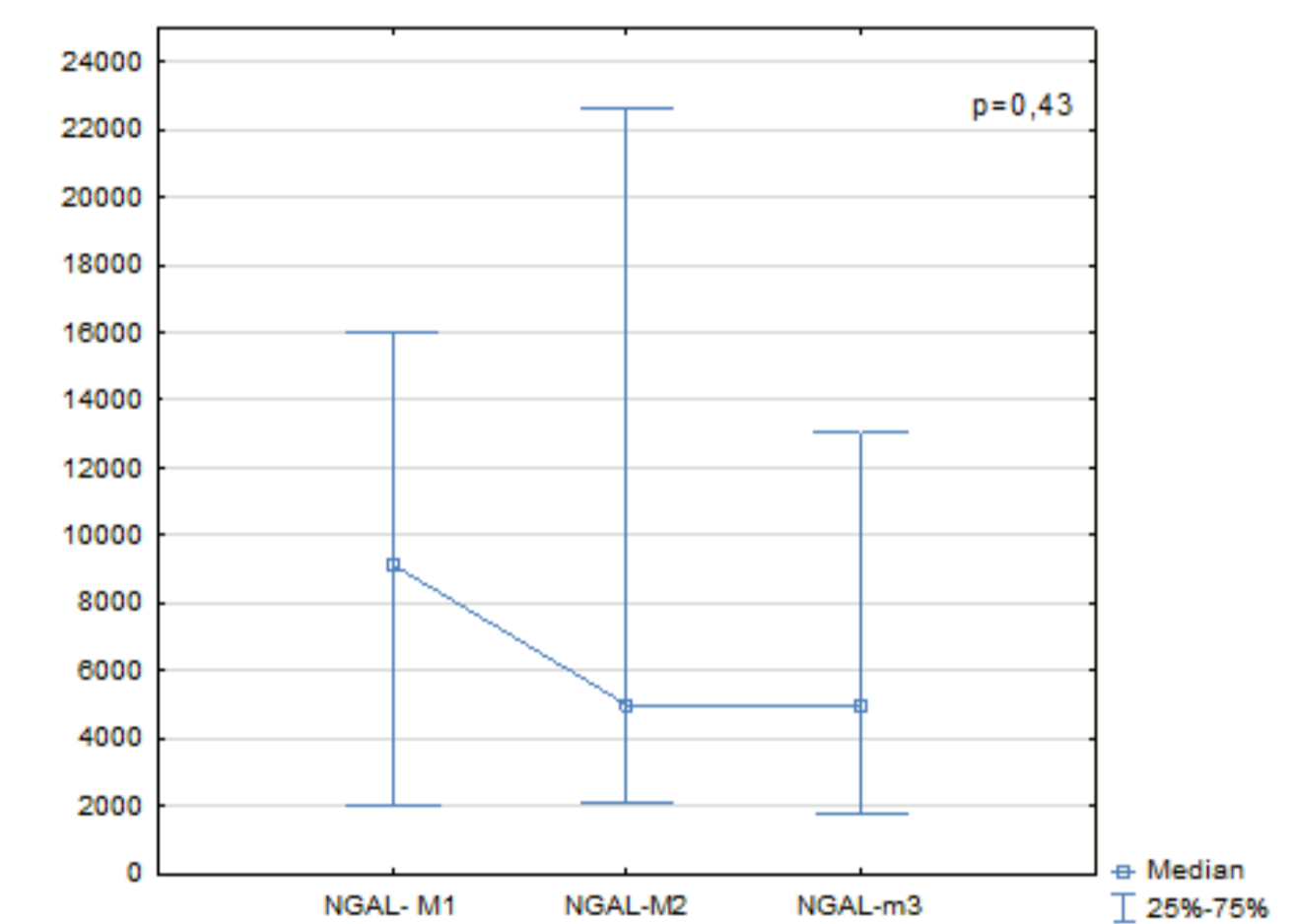
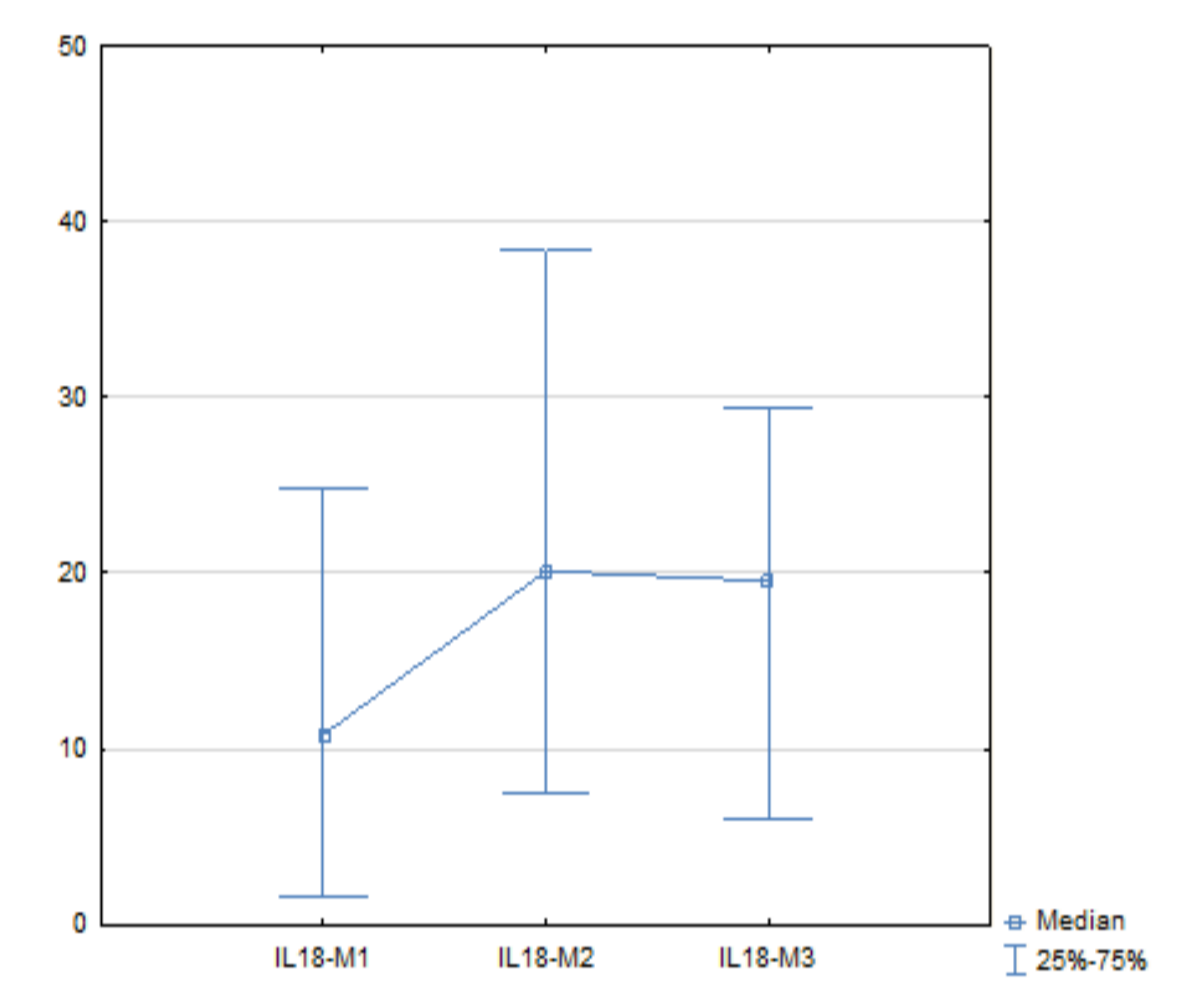
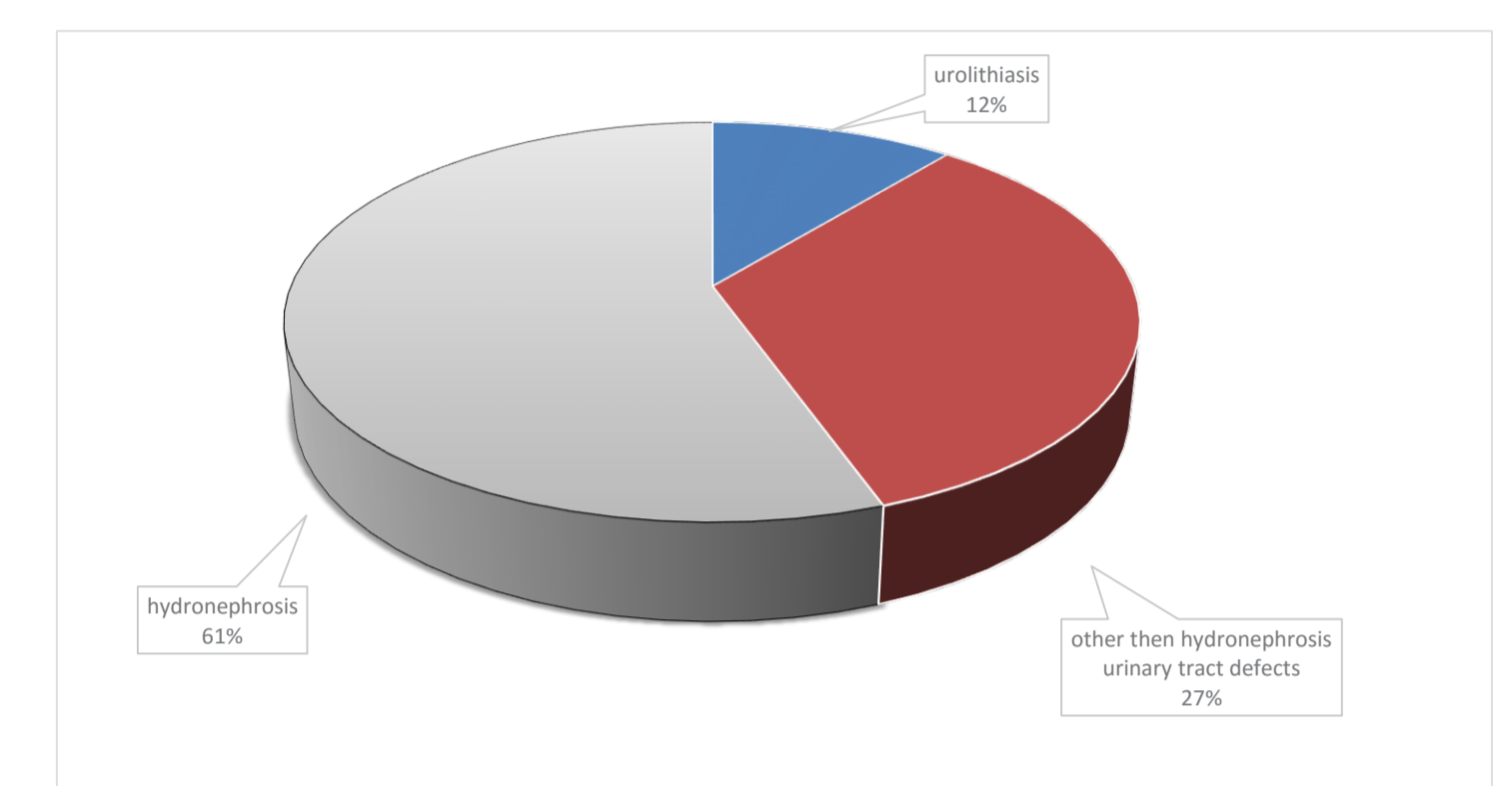
NGAL determination was performed with the use of Human Lipocalin-2 / NGAL Immunoassay, IL-18- with the use of ELISA Kit (MBL International Corporation).

## RESULT

There were no statistically significant differences in the concentrations of NGAL and IL-18 in serum assessed before the procedure and after administration of contrast agent.

The analysis showed that the concentration of IL-18 and NGAL in urine did not differ significantly in three consecutive preformed measurements.

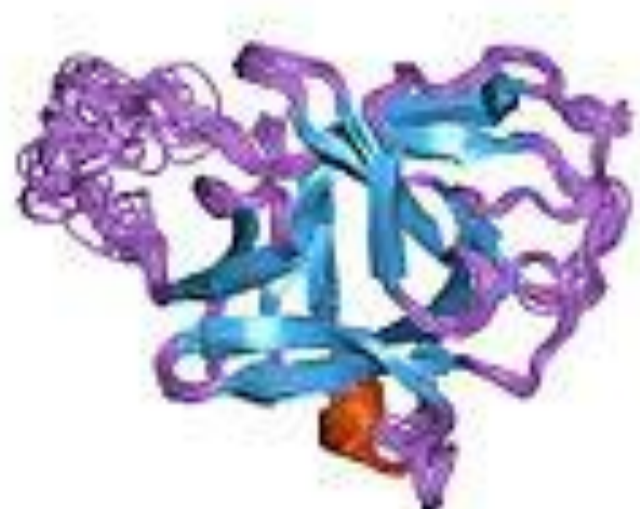
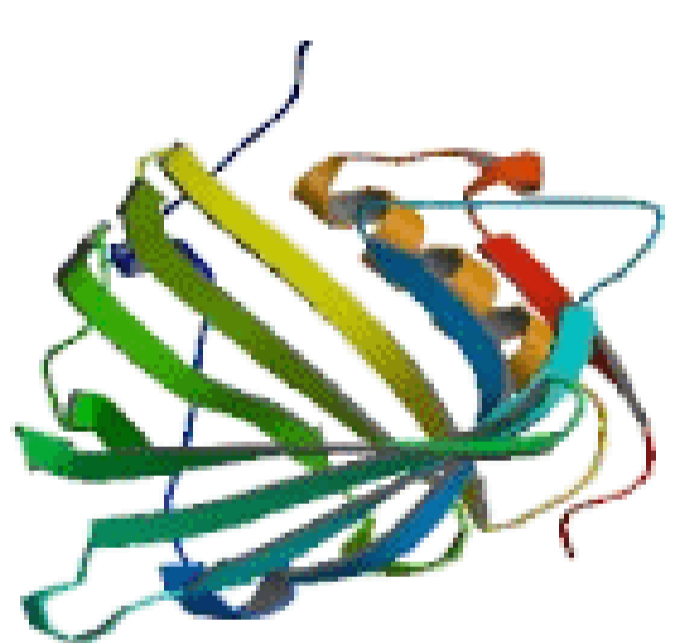
The study has also found no statistically significant differences between serum creatinine before and 48 hours after injection of contrast (median[I-III quartile] 0,3[0,2-0,5]- 0,4[0,3-0,4] mg/dl).



	Before administration of contrast agent Median and quartile range	After administration of contrast agent Median and quartile range	p
<b>Creatinine (mg/dL)</b>	0.3 (0.2-0.5)	0.4 (0.3-0.4)	ns.(0.2)

	Before administration of contrast agent (Average ± SD)	48 h after administration of contrast agent (Average ± SD)	p
<b>NGALs (pg/ml)</b>	47806 ± 25999	51860 ± 28677	ns. (0.54)
<b>IL18s (pg/ml)</b>	253.13 ± 242.73	322.95 ± 304.83	ns. (0.13)

	Before administration of contrast agent Median and quartile range	2-4 hours after administration of contrast agent Median and quartile range	48 hours after administration of contrast agent Median and quartile range	p
<b>NGAL<sub>u</sub> (pg/ml)</b>	9150.90 (2002.50-15969.00)	4996.00 (2139.30 - 22613.00)	4945.20 (1738.00 - 13043.10)	ns. (0.43)
<b>IL-18<sub>u</sub> (pg/ml)</b>	10.80 (1.50 - 24.75)	20.10 (7.40 - 38.40)	19.55 (5.95 - 29.40)	ns. (0.17)



## CONCLUSIONS:

•However implementation of new biomarkers such as NGAL and IL-18 expands the possibilities of renal function assessment in children undergoing contrast radiological procedures, in examined children with normal or slightly impaired renal function they didn't demonstrate the risk of contrast nephropathy.

### Bibliography

- McCullough PA (2008): Contrast-Induced Acute Kidney Injury. JACC 51: 1419-1428.
- Edelstein CL: Biomarkers in kidney disease. (1st ed.). London, UK: Elsevier, 2010.
- Jung A, Jobs K, Zuber J(2011): Biomarkery uszkodzenia miazszo nerek. Pediatr Med Rodz. 2011; 7: 319-325.
- Devarajan P (2011): Biomarkers for early detection of acute kidney injury. Curr Opin Pediatr 23: 194-200.
- Devarajan P(2008): Neutrophil gelatinase-associated lipocalin (NGAL): A new marker of kidney disease. Scand J Clin Lab Invest Suppl 241: 89-94.
- Hirsch R, Dent C, Pfrimm H, et al (2007): NGAL is an early predictive biomarker of contrast-induced nephropathy in children. Pediatr. Nephrol 22: 2089-2095.
- Panikh CR, Jani A, Melnikov VY, et al (2004): Urinary interleukin-18 is a marker of human acute tubular necrosis. Am J Kidney Dis 43: 405-414.
- Nguyen MT, Devarjan P(2008): Biomarkers for early detection of acute kidney injury. Pediatr Nephrol 23: 2151-2157.
- He H, Li W, Qian W et al. (2014): Urinary interleukin-18 as an early indicator to predict contrast-induced nephropathy in patients undergoing percutaneous coronary intervention. Experimental and therapeutic medicine 8: 103-107.



WOJSKOWY INSTYTUT MEDYCZNY

