**Discrepancies between urinary and plasma NGAL concentrations in patients admitted to the medical intensive care**

Pierre Delanaye, Bernard Lambermont, Philippe Morimont, Jean-Marie Krzesinski, Nicolas Maillard, Guillaume Claisse, Etienne Cavalier, Christophe Mariat.

**Introduction**

Both plasma and urinary NGAL concentrations are presented as useful tests to detect acute kidney injury (AKI) in intensive care units. However, little is known about the concordance between these two biomarkers at the individual level.

**Methods**

Urinary and plasma NGAL were measured in patients within the first 24 hours after admission to the medical intensive care unit of our University hospital. The same turbidimetric method was used to quantify NGAL both in urine and plasma (Bioporto, Gentofte, Denmark on Roche Cobas 6000). We compared plasma and urine concentrations. For urinary NGAL, absolute values and ratio of NGAL to urinary creatinine were used. Different cut-offs were considered for the diagnosis of AKI in the two milieus: 100, 150, 200 or 300 ng/mL. We focused on the cut-off value of 150 ng/mL as it is the most used in the literature. We compared the percentage of patients with potential diagnosis of AKI when urine or plasma concentrations were considered. Discrepant results were patients with higher values than a defined threshold (for example 150 ng/mL) in the urine and lower than the cut-off in the plasma, or conversely.

**Results**

Simultaneous measurements of urinary and plasma NGAL have been performed in 98 patients. Mean age was 64±15 y and 59% were men. Median [IQR] plasma concentrations was 218 [118-440] ng/mL. Median urinary concentrations (absolute and ratio to creatinine) were 57 [23-295] ng/mL and 115 [52-479] ng/g, respectively. Considering the absolute urinary NGAL concentrations, we observed a concordance in the AKI diagnosis between urinary and plasma results which ranges from 40 to 76%, according to the cut-offs used. The lowest concordance was observed if the cut-off was 100 ng/mL for plasma and 300 ng/mL for urine. The best concordance was observed for a cut-off of 300 ng/mL for plasma and 150 ng/mL for urine. If the cut-off of 150 ng/mL was considered for the two milieus, the global concordance between urine and plasma was 64%. In the 62 patients with concordant values, AKI was found in 33 patients (53%) . In the 35 patients with discordant values, the plasma concentration was higher than 150 ng/mL (and the urinary concentration below 150 ng/mL) in 33 patients. Only 2 patients had urinary concentrations higher than 150 ng/mL although plasma concentrations remained lower than 150 ng/mL. Regarding the urinary concentration with the ratio to creatinine, a concordance in AKI diagnosis was observed from 45 to 73%. If the cut-off of 150 ng/mL was considered for AKI diagnosis in the two milieus, a concordance of 63% was observed. In the 36 patients with discordant values, the plasma concentration was higher than 150 ng/mL (and the urinary concentration below 150 ng/mL) in 29 patients. Seven patients had urinary concentrations higher than 150 ng/mL although plasma concentrations remained lower than 150 ng/mL.

**Conclusions**

At best, our study showed that measurement of NGAL in the urine versus in the plasma was discordant in 25% of patients hospitalized in the intensive care units. In most discrepants, the urinary NGAL was below the pathological cut-off whereas the plasma NGAL was increased.