Letter to the Editor

Neutrophil gelatinase-associated lipocalin: comparison of the use of EDTA and heparin plasma

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In recent years, neutrophil gelatinase-associated lipocalin (NGAL) emerged as a potential marker for early detection of kidney damage (1, 2). However, ELISA techniques, which are particularly difficult to use in routine clinical practice on a 24-h/7-day basis, were used in the majority of these investigations (3, 4). Commercial kits for the determination of NGAL that could be applied to routine chemistry analyzers were introduced very recently (5). The automated non-competitive two-site sandwich immunoassay supplied by Abbott Laboratories (Abbott Park, IL, USA) which allows the determination of urinary NGAL with the Architect platform was shown to give more precise results than the Triage (Biosite-Iverness Medical, Waltham, MA, USA) point-of-care immunoassay for NGAL in whole blood or plasma. A new particle enhanced turbidimetric immunoassay (PETIA) supplied by Biporto Diagnostics A/S (Gentofte, Denmark) for the determination of NGAL in urine or EDTA-plasma can be adapted to a variety of clinical chemistry analyzers, thereby fulfilling the 24/7 prerequisite necessary for early detection of kidney damage. In our laboratory, this PETIA assay (prod. no.: ST001RA, Biporto) was adapted to a Modular P analyzer (Roche GmbH, Mannheim, Germany) according to the manufacturer’s instructions. During a two-month evaluation period using one lot of reagents and four calibration cycles, this PETIA assay proved to be reproducible when using the NGAL control kit of Biporto (prod. no.: ST003RA) as shown by the results: control low: mean±SD=196±6.7 μg/L, n=36, CV=3.4%; control high: mean±SD=492±13.3 μg/L, n=36, CV=2.7%. These CV results are in accordance with the CV numbers stated by the supplier in their kit insert. Therefore,

![Alman-Bland graph of the differences of NGAL between heparin plasma and EDTA-plasma against the mean NGAL.](image)

Bias (heparin-EDTA)=10.4; 95% range of bias=3.3–17.6; 95% limits of agreement: –60 to 81.

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this assay is sufficiently precise in the range (150–420 μg/L) where the cut-off value to discriminate for acute kidney insufficiency is supposed to be (4). For this PETIA assay, EDTA-plasma is suggested by the supplier as the preferred blood derived specimen. However, as heparin plasma, instead of EDTA-plasma, is the preferred sample type for the routine chemistries in our laboratory, we investigated the use of heparin plasma as an alternative for the recommended EDTA-plasma. For this comparison study, blood samples were collected from patients from both the intensive care unit and the department for chronic hemodialysis. When heparinized blood as well as EDTA blood was collected simultaneously, the waste blood of both sample types was used for NGAL analysis. Analysis was performed on the same day the blood-derived samples were collected. The results of the paired heparin and EDTA samples were correlated with the method of Passing and Bablok with the following result: \[ \text{Heparin} = 1.01 \times \text{EDTA} + 5.6; \] 95% range proportional = 1.00–1.02; 95% range constant = 1.3–9.0; \[ R=0.9978; \] bias (heparin-EDTA) = 10.4; 95% range of bias = 3.3–17.6. The difference plot is shown in Figure 1. This excellent correlation is accompanied by a small but significant constant bias, which probably needs adapting the cut-points slightly for use with heparin plasma. Nevertheless, according to this excellent correlation, next to EDTA-plasma, heparinized plasma is suitable to be used in this NGAL assay. Therefore, NGAL without any doubt can be assayed together with other routine chemistries using heparin-plasma in an automated analyzer, which makes this NGAL assay suitable for a 24-7 service without adapting the sample logistics.

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**References**