

CORRESPONDENCE

Electronic Alerts for Acute Kidney Injury—A Systematic Review

by Prof. Dr. med. Michael Haase, Prof. Dr. med. Andreas Kribben, Prof. Dr. med. Walter Zidek, Prof. Dr. med. Jürgen Floege, Dr. med. Christian Albert, Prof. Dr. med. Berend Isermann, Prof. Dr. med. Bernt-Peter Robra, and Dr. rer. medic. Anja Haase-Fielitz in issue 1–2/2017

Functional Impairment Does not Equal Injury

The glomerular filtration rate is proportional to cardiac output. Neither term was mentioned in the article (1), however. The glomerular filtration rate is the only objective measure for determining the severity of renal failure. Renal failure is only rarely caused by severe bilateral painful kidney injury or disease. In persons with healthy kidneys, the glomerular filtration rate is a measure not only for the severity of renal failure but also for the severity of heart failure. Heart failure is defined as too small a pumped volume of oxygenated blood. The stage of renal failure is never lower than that of heart failure. Too much emphasis is placed on the distinction between acute and chronic renal failure. If the extrarenal diseases are treated successfully, the renal failure will regularly recede.

Additionally, the terms mortality and case fatality rate (letality) were confused. The mortality rate is the death rate in the setting of this particular disease, whereas the case fatality rate is the death rate due to a particular disease. This is a fundamental difference.

Renal failure is only rarely caused by nephropathy or kidney disease. These are the reno-renal syndromes. “Acute kidney injury” should be replaced by “acute renal failure”, as long as no severe disease is found on histology. Functional impairment does not have to be due to a disease of the affected organ. Even the healthiest heart can pump only the blood that is available. Even the healthiest kidneys can filtrate only the plasma that is available.

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REFERENCES

1. Haase M, Kribben A, Zidek W, et al.: Electronic alerts for acute kidney injury—a systematic review. *Dtsch Arztebl Int* 2017; 114: 1–8.

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Conflict of interest statement

The author declares that no conflict of interest exists.

Effect of the Method for Creatinine Measurement

Haase et al. in their review article conclude that an electronic alert system in acute kidney injury coupled with concrete treatment recommendations, has a positive effect on relevant endpoints (1). With regard to the applicability of these study results to the German speaking area, we wish to draw attention to an aspect that is important in the context of the creatinine

measurement procedure .

Most of the studies cited by Haase et al. measured creatinine—as is common in Anglo-Saxon countries—by using the kinetic Jaffé reaction with compensation. Many laboratories in Germany, however, use an enzyme-based assay, that is less influenced by interfering substances, such as a high glucose concentration in the specimen (2). For chronic renal failure, it is well known that different methods for creatinine measurement affect the estimated glomerular filtration rate, thus resulting in misclassifications (3). This raises the question of whether in acute renal injury the incidence and severity also depend on the creatinine measurement procedure and whether this affects the endpoint analysis. To answer this question, we are currently conducting a prospective study with parallel creatinine measurements in inpatients. During a two-week pilot period, an alert-triggering event was registered by only one of the two creatinine measurement procedures in 27% of cases (35 of 130) (15 by the enzymatic method, 20 by the Jaffé method).

We support the conclusion by Haase et al., that patient care can benefit from an electronic alert system. Potential factors of influence, including the method for creatinine measurement, should be considered before the system is implemented, in close cooperation with the medical disciplines involved.

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REFERENCES

1. Haase M, Kribben A, Zidek W, et al.: Electronic alerts for acute kidney injury—a systematic review. *Dtsch Arztebl Int* 2017; 114: 1–8.
2. Greenberg N, Roberts WL, Bachmann LM, et al.: Specificity characteristics of 7 commercial creatinine measurement procedures by enzymatic and Jaffe method principles. *Clin Chem* 2012; 58: 391–401.
3. Schmidt RL, Straseski JA, Raphael KL, Adams AH, Lehman CM: A risk assessment of the Jaffe vs enzymatic method for creatinine measurement in an outpatient population. *PLoS One* 2015; 10: e0143205.

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In Reply:

We welcome Dr Raeder’s comment, especially regarding the rapid and consequently often successful treatment of the trigger of acute kidney injury.

The term of in-hospital mortality used in the article (1) refers to those patients with acute kidney injury who did not survive their inpatient stay. A causal association between disorder/syndrome and death is not a prerequisite for using this term.

The point of electronic alerting systems for acute kidney injury is the immediate capture and passing on of information of acute reduction in renal function—no matter what the cause is—to the treating doctors. Current studies are investigating the question of which groups of patients with which underlying

etiology of acute kidney injury benefit the most from the immediate initiation of consented treatment measures, from cross-sectoral information exchange in follow-up care, and from histological investigation results. A proof that the course of acute kidney injury can be positively influenced in the sense of improved renal function exists in the shape of subgroup analyses from studies in which the transmission of the information “acute kidney injury” was linked to concrete treatment recommendations.

We agree with the comments of Dr Kiehintopf and colleagues, in which they describe the influence of the measuring technique for creatinine on the frequency of the diagnosis of acute kidney injury and the correspondingly defined patient cohort. In view of the named treatment period and the hospital specific treatment codes, the proportion of patients who were treated as inpatients at a German university medical center and had acute kidney injury is an estimated 5–7%. Of the 130 cases reported as having acute kidney injury, 95 cases were detected by the enzyme based test as well as the kinetic test. Another 15 cases were detected by the enzyme based test alone, and 20 cases were detected kinetically according to Jaffé. If an institute of laboratory medicine uses only one of those two tests, the proportion of detected cases with acute kidney injury will differ by <5% between the methods. The clinical relevance of patient populations with acute kidney injury discovered by only one or the other measuring technique will be

able to be assessed on the basis of other proofs. In case of doubt, the laboratory should be consulted to clarify the measuring technique and to initiate further measures if required. However, documenting the creatinine measuring technique seems recommendable even now of the planning, analysis, and interpretation of studies.

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REFERENCES

1. Haase M, Kribben A, Zidek W, et al.: Electronic alerts for acute kidney injury— a systematic review. *Dtsch Arztebl Int* 2017; 114: 1–8.

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CLINICAL SNAPSHOT

Hard to Swallow

A patient suffering from dementia was admitted to the hospital with dysphagia and vague abdominal complaints. He had not complained of swallowing difficulties before, nor had any been noticed by the persons caring for him. A speech-therapeutic swallowing assessment yielded no evidence of clinically significant oropharyngeal dysphagia or of an elevated risk of aspiration. Esophagogastroduodenoscopy revealed a tablet blister firmly impacted in the mucosa of the distal segment of the esophagus. It was removed with a foreign-body forceps (raptor) under endoscopic vision as the endoscope was withdrawn. The patient’s symptoms resolved, and he was able to eat normally again.



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