

Detection of Renal Dysfunction by Point of Care Creatinine Testing in Patients undergoing Peripheral MR Angiography

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Objectives

The link between the development of nephrogenic systemic fibrosis (NSF) and the use of gadolinium-based contrast agents (GBCAs) in patients with renal dysfunction has led to the need to identify such patients before undergoing these types of studies. Two main ways of screening for patients with renal dysfunction include the administration of a pre-study questionnaire and the use of point of care (POC) serum creatinine testing. In this study, we aim to analyze the effectiveness of pre-study questionnaires in identifying patients at risk for developing NSF as well as estimate the prevalence of chronic kidney disease (CKD), NSF risk factors, and other co-morbidities in patients scheduled to undergo lower extremity magnetic resonance angiography (MRA) GBCA studies.

Methods

This study was based upon a HIPAA-compliant and IRB-approved retrospective review of patients' records, and informed consent of patients was not required. Patient demographics, co-morbidities, contrast type, POC serum creatinine values, and responses to pre-study questionnaires regarding knowledge of patients' history of renal dysfunction were recorded for all patients undergoing a lower extremity magnetic resonance angiography exam in a single year. Patients were compared with respect to demographic, co-morbidity, and contrast data according to their CKD status. Patient questionnaire results were also compared to their POC-based CKD classification.

Results

Of 199 total patients, 72 patients had stage 3 CKD, 6 patients had stage 4 CKD, and 7 patients had stage 5 CKD based upon POC test results. Co-morbidities including transplant status, presence of diabetes, hypertension, coronary artery disease, and smoking status showed significant differences among the CKD groups. Only 6.9% of stage 3 patients were aware of any history of renal dysfunction, whereas 50% of stage 4 and 100% of stage 5 patients admitted any history of renal dysfunction via questionnaires (Figure 1).

Conclusion

A pre-study questionnaire alone cannot be relied upon in screening at-risk patients, and POC creatinine testing can more reliably detect renal dysfunction in patients scheduled to undergo lower extremity MRA GBCA studies.

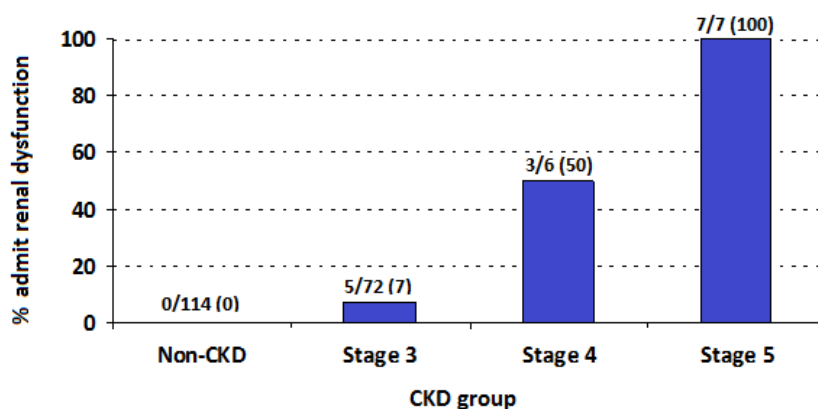


Figure 1. Admission of renal dysfunction by POC-determined CKD group