

## AN EVALUATION OF AN AUTOMATED ALERT SYSTEM FOR ACUTE KIDNEY INJURY (AKI)

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Earlier recognition of AKI might lead to improvements in outcome. Previous studies in this hospital have shown that there is delayed recognition of AKI by clinicians, when it is indicated by a rise in creatinine. Automated reporting systems have the potential to improve early recognition of AKI. We have carried out a prospective study of such a system, used to detect acute rises in creatinine, amongst all creatinines reported by the laboratory for two hospitals.

We used the Alert system within the ICE desktop (Anglia Healthcare Systems Ltd), the laboratory requesting and reporting software used in this Trust. All Creatinine results were compared by ICE with the previous result for that patient. In our laboratory a creatinine rise of 75% or more corresponds to a predicted GFR fall of 48% or more, roughly equivalent at a minimum to the Injury stage of the RIFLE classification. The ICE desktop sent an alert message to a dedicated inbox if the creatinine had risen 75% or more from the previous result. This system was run for three months from September to December 2008.

764 alerts were generated by ICE. We excluded 298 alerts from further study: 176 from chronic haemodialysis patients; 52 repeat alerts from the index episode; 21 from AKI patients who were already dialysis dependant; 19 alerts from further episodes of AKI; 9 from children under 16 years of age; and 21 for miscellaneous reasons. This left 466 alerts potentially due to an episode of AKI that began during the study period.

The AKI patients were elderly – median (range) age was 74.7 (16-103) years; 55.6% were female. 84% of all alerts were from hospital patients (including the Emergency department). The alert system detected a wide range of AKI. At one extreme it detected relatively modest rises in creatinine. The maximum creatinine rise during the AKI episode was a median (range) of 115 (35 – 1228)  $\mu\text{mol/l}$  [the initial rise detected by ICE may have been less]. Nevertheless, the mortality on followup in these patients was substantial. 466 patients were split into quartiles based on the lowest GFR (nadir) recorded for that episode of AKI:

Quartile	n	Median nadir GFR for that quartile	% Dead	Median followup
1	117	11.3 ml/min	53.0%	23 days
2	116	20.2 ml/min	39.7%	34 days
3	117	30.9 ml/min	33.3%	39 days
4	116	51.3 ml/min	28.4%	36 days

A full survival and comorbidity analysis will be presented. Our data suggests that AKI equivalent to the Injury stage of the RIFLE classification (or worse) is common. Even AKI which causes modest renal functional impairment is associated with a significant mortality. More research is needed into providing interventions to improve the poor outlook of this elderly group of patients with AKI. Clinicians caring for these patients need improved understanding of the implications of AKI. The development of automated reporting has clear potential to improve the early recognition of AKI.