NICE National Institute for Health and Care Excellence

Surveillance report 2017 – Acute kidney injury: prevention, detection and management (2013) NICE guideline CG169

Surveillance report

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Contents

Surveillance decision

We will not update the guideline on acute kidney injury at this time.

Reason for the decision

Assessing the evidence

We found 109 studies through surveillance of this guideline.

This included evidence on:

- assessing the risk of acute kidney injury (AKI) in adults
- preventing AKI in adults having iodinated contrast agents
- monitoring and preventing deterioration in patients with or at high risk of AKI.

We asked topic experts whether this evidence would affect current recommendations. Generally, the topic experts thought that an update of these areas was not needed.

We also identified evidence that supports current recommendations on:

- preventing the inappropriate use of nephrotoxic drugs
- referring for renal replacement therapy (RRT).

We found evidence which was not covered in the guideline on:

- remote ischemic conditioning to prevent AKI after cardiac surgery
- pharmacological interventions to prevent AKI after cardiac surgery
- choice of RRT
- detection and management of AKI in the community setting.

However, the evidence was insufficient to add new recommendations in these areas at this time.

We did not find any evidence related to early warning scores in children, staging of AKI, urinalysis, ultrasound, relieving urological obstruction, referring to nephrology.

Equalities

No equalities issues were identified during the surveillance process.

Overall decision

After considering all the evidence and views of topic experts and stakeholders, we decided not to update the guideline at this time.

See how we made the decision for further information.

Commentary on selected evidence

With advice from topic experts we selected 1 study for further commentary.

Preventing acute kidney injury – Monitoring and preventing deterioration in patients with or at high risk of acute kidney injury

We selected a cluster randomised controlled trial (RCT) by Awdishu et al. (2016) for a full commentary. This study builds upon the evidence base underpinning the original recommendations.

What the guideline recommends

NICE's guideline on acute kidney injury recommends that electronic clinical decision tools (CDS) should be considered in appropriate settings (recommendations 1.2.10–1.2.12) or where it is feasible to do so, while upholding clinical judgements. NICE advises that any such tool or system for electronic prescribing must be able to:

- interact with laboratory systems
- recommend both drug dose and frequency
- store data on patient history characteristics
- alerts for healthcare professionals which are mandatory to acknowledge and review.

Methods

The cluster RCT (n=514 clinicians, 4,068 patients) by Awdishu et al. (2016) investigated the use of CDS for 20 medications, operating within an electronic health record. Clinicians in outpatient and inpatient settings were recruited to the study. Clinicians in the intervention group, received live CDS integrated into their electronic health record system (Epic Systems Corporation, Verona, Wisconsin). The CDS tool generated alerts specific to medications that had been determined to benefit from such intervention. Medications were chosen if they were contraindicated or cautioned (needed dose reductions) in

patients with renal impairment. Doses were determined by the estimation of creatinine clearance (CrCl), calculated using the Cockcroft-Gault equation. The alerts generated by the tool were either: prospective (triggered when a drug is prescribed for a patients with contraindicated CrCl levels), and look-back alerts (triggered by declining renal function in patients already prescribed targeted medications). Clinicians randomised to the control group, did not receive any live alerts but the record would generate silent alerts that were noted for comparison purposes. Both groups received input from pharmacists as available. Patients were recruited by their clinician, if they met the inclusion criteria: adults aged 18 years or older, estimated glomerular filtration rate <60ml/min, prescribed at least one or more medicines targeted by the CDS tool, and had records of current height and weight. Patients who were receiving dialysis, pregnant or breast-feeding were excluded because of difficulties in calculating creatinine clearance. The aim of the study was to determine the effects of real-time alerts on the prevention of inappropriate prescriptions in patients with acute or chronic kidney disease and the investigators defined the primary outcome as "a 20% increase in the rate of contra-indicated medications discontinued or drug dosage adjustments in patients with kidney disease".

Results

The primary outcome was a combination of both alerts (prospective and look-back alerts) resulting in a reduced rate of inappropriate prescriptions; a statistically significant reduction was seen in those that received the CDS tool compared to the control (17.0% vs 5.7%, p<0.0001).There was no significant difference in the number of alerts generated in both groups (254 and 260 in the intervention and control group, respectively). Electronic alerts led to a significant increase in dosage adjustments compared to pharmacist advice alone (44.1% vs 27.2, p<0.0001). This effect was also seen in the number of drugs continued (7.1% vs 1.5%, p<0.0001). Prospective alerts were associated with a greater portion of medication adjustments compared with dosage adjustment alerts (prospective alerts: odds ratio = 9.91, 95% CI 7.10 to 13.84, p<0.0001; dose adjustments alerts: odds ratio = 9.30, 95% CI 6.80 to 12.71, p<0.0001). Multivariable regression analysis showed that the CDS tool was able to significant reduce inappropriate prescribing in at risk patients (odds ratio = 1.89, 85% CI 1.45 to 2.47, p <0.0001).

Strengths and limitations

Strengths

- The inclusion criteria in this study is consistent with the population considered in NICE guideline CG169.
- Multivariate regression analysis including both characteristics of clinicians and patients was reported.
- The study provided a CONSORT diagram, detailing no participants lost to follow-up or excluded from analysis.

Limitations

- The study didn't not report hard outcomes such as incidence of AKI, or mortality which a longer follow-up time would have allowed for. The time taken to adjust prescriptions was not reported.
- The study was conducted in a non-UK population and therefore may pose some issues with generalisability to the healthcare setting outlined in NICE guideline CG169.
- The supplementary material supplied with this study could not be accessed (03 February 2017); information on the medications flagged for intervention could not be determined.
- The study was rated unclear risk of bias as the method of randomisation was not reported; a study protocol was not reported however all specified outcomes were reported.

Impact on guideline

The new evidence is in support of the use of clinical decision support tools, and demonstrates its use in both inpatient and outpatient settings. This is consistent with recommendations 1.2.10–1.2.11 in NICE guideline CG169. The guideline allows for choice in the adoption and implementation of such tools; however there isn't sufficient evidence to recommend a specific CDS tool.

The topic experts believe that while there is contention as to the use of electronic alerts to

diagnose AKI, there is firm evidence to support the guidelines recommendations to use electronic prescribing tools in order to prevent AKI in high risk patients.

How we made the decision

We check our guidelines regularly to ensure they remain up to date. We based the decision on surveillance 4 years after the publication of NICE's guideline on acute kidney injury (CG169) in 2013.

For details of the process and update decisions that are available, see ensuring that published guidelines are current and accurate in developing NICE guidelines: the manual.

Evidence

We found 105 studies in a search for randomised controlled trials and systematic reviews published between 1 January 2013 and 12 October 2016. We also considered 4 additional studies identified by members of the guideline committee who originally worked on this guideline.

From all sources, we considered 109 studies to be relevant to the guideline.

We also checked for relevant ongoing research, which will be evaluated again at the next surveillance review of the guideline.

See appendix A: summary of evidence from surveillance for details of all evidence considered, and references.

Views of topic experts

We considered the views of topic experts, including those who helped to develop the guideline and other correspondence we have received since the publication of the guideline.

Views of stakeholders

Stakeholders are consulted only if we decide not to update the guideline following checks at 4 and 8 years after publication.

Stakeholders commented on the decision not to update the guideline. Overall, 9 stakeholders commented. See appendix B for stakeholders' comments and our responses.

Nine stakeholders commented on the proposal to not update the guideline: 4 agreed with the decision; 3 disagreed with the decision; and 2 noted that they had no comments on the proposals. The stakeholders who did not agree with the proposal suggested the areas of diet and lifestyle, patient experience and biomarkers should be updated, however no evidence was identified during the surveillance review or during stakeholder consultation which has an impact on current guideline recommendations. One stakeholder did not provide details as to why they did not agree with the proposal not to update. Several comments suggested extensions to the scope. However, evidence in some of the areas suggested by stakeholders was not sufficient at this time to impact the current guideline. Other areas identified by stakeholders may be more appropriate to be included in the new guideline on perioperative care. Six stakeholders commented on the proposal to remove the research recommendation: 4 agreed with the decision; 2 disagreed with the decision, based on stakeholder feedback the research recommendation will be retained.

See ensuring that published guidelines are current and accurate in developing NICE guidelines: the manual for more details on our consultation processes.

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