Emergency interventions for Hyperkalaemia

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Abstract

BACKGROUND:

Hyperkalaemia occurs in outpatients and in between 1% and 10% of hospitalised patients. When severe, consequences include arrhythmia and death.

OBJECTIVES:

To review randomised evidence informing the emergency (i.e. acute, rather than chronic) management of hyperkalaemia

SEARCH STRATEGY:

We searched MEDLINE (1966-2003), EMBASE (1980-2003), The Cochrane Library (issue 4, 2003), and SciSearch using the text words hyperkal* or hyperpotass* (* indicates truncation). We also searched selected journals and abstracts of meetings. The reference lists of recent review articles, textbooks, and relevant papers were reviewed for additional potentially relevant titles.

SELECTION CRITERIA:

All selection was performed in duplicate. Articles were considered relevant if they were randomised, quasi-randomised or cross-over randomised studies of pharmacological or other interventions to treat non-neonatal humans with hyperkalaemia, reporting on clinically-important outcomes, or serum potassium levels within the first six hours of administration.

DATA COLLECTION AND ANALYSIS:

All data extraction was performed in duplicate. We extracted quality information, and details of the patient population, intervention, baseline and follow-up potassium values. We extracted information about arrhythmias, mortality and adverse effects. Where possible, meta-analysis was performed using random effects models.

MAIN RESULTS:

None of the studies of clinically-relevant hyperkalaemia reported mortality or cardiac arrhythmias. Reports focussed on serum potassium levels. Many studies were small, and not all intervention groups had sufficient data for meta-analysis to be performed. On the basis of small studies, inhaled beta-agonists, nebulised beta-agonists, and intravenous (IV) insulin-and-glucose were all effective, and the combination of nebulised beta agonists with IV insulin-and-glucose was more effective than either alone. Dialysis is effective. Results were equivocal for IV bicarbonate. K-absorbing resin was not effective by four hours, and longer follow up data on this intervention were not available from RCTs.

AUTHORS' CONCLUSIONS:

Nebulised or inhaled salbutamol, or IV insulin-and-glucose are the first-line therapies for the management of emergency hyperkalaemia that are best supported by the evidence. Their combination may be more effective than either alone, and should be considered when hyperkalaemia is severe. When arrhythmias are present, a wealth of anecdotal and animal data suggests that IV calcium is effective in treating arrhythmia. Further studies of the optimal use of combination treatments and of the adverse effects of treatments are needed.