Safety and cost of rapid IV injection of famotidine in critically ill patients

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The use of histamine H2-receptor antagonists (H2RAs) (specifically famotidine) administered intravenously to patients in intensive care units.

Type of intervention
Treatment

Economic study type
Cost-effectiveness analysis.

Study population
Patients admitted to a coronary care or ICU who received at least one dose of famotidine injection as part of their treatment.

Setting
Hospital. The economic study was carried out in Denver, Colorado, USA.

Dates to which data relate
Effectiveness and resource data werecollected over a two month period in 1994. Price years were not stated.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was undertaken prospectively on the same patient sample as used in the clinical study.

Study sample
Patients who met the study criteria in a two month period were randomly assigned to the two treatment groups. Power calculations were not used to determine sample size. 53 patients received famotidine by rapid i.v. injection and 52 by slow i.v. infusion. 193 patients were excluded from the study as they did not received H2RA therapy during their time in the ICU. The sample obtained in the two month period was representative of the admissions to the ICU over the previous 18 months.

Study design
Single-centre, randomised, controlled trial. The duration of follow up was to the point where i.v. famotidine treatment
was terminated. There was no loss to follow up.

Analysis of effectiveness
The analysis of effectiveness was based on the intention to treat. Primary health outcomes were not assessed as these were assumed to be the same in both treatment groups. Adverse effects in each group were assessed. Demographically there were no significant differences between the two groups.

Effectiveness results
The effectiveness of famotidine was not considered. Adverse effects were observed in five patients: three in the injection group and two in the slow infusion group. No significant difference was noted between the groups for cardiovascular variables.

Clinical conclusions
Rapid i.v. injection of famotidine is as safe as slow infusion of famotidine for patients in ICUs.

Measure of benefits used in the economic analysis
Since the effectiveness analysis assumed that there was no difference in the effectiveness/clinical benefits between the intervention and the comparator, the economic analysis was based on the difference in costs only.

Direct costs
Some quantities of resource use were reported separately from the costs. Costs relating to the administration of famotidine in the hospital were estimated. Specifically these included drug acquisition, dilutants, syringes, needles, 0.9% sodium chloride solution for flushing catheter ports, alcohol swabs, and nursing time. Drug acquisition costs were taken from average wholesale prices in the 1994 Red Book. All other supply costs were taken from information on contractual agreements with the hospitals central supply department. Nursing time costs were based on the average hourly rate for ICU nursing services and the average time required to prepare and administer a single dose of famotidine. The average time was based on data collected by stopwatch timing and direct observation during the study. The price year was not specifically stated.

Statistical analysis of costs
Chi square analysis, Fisher's exact test and the two tailed student t-test were performed to compare costs.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was not conducted.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The total cost per dose of administering famotidine by i.v. injection was $5.32 compared with $6.73 for the slow i.v. infusion group.
Synthesis of costs and benefits
Not applicable.

Authors' conclusions
The author concluded that administering famotidine by rapid i.v. injection was as safe as slow i.v. infusion and minimised the costs of the therapy.

CRD Commentary
The author did not explicitly state the year during which the study data were collected nor does he report the price years used. A sensitivity analysis on the costs identified in the study should have been performed, since costs (as noted by the author) may vary greatly between different hospitals. The author also notes that the sample size in this study is too small to state that the rapid injection method is absolutely safe.

Implications of the study
A well designed randomised control trial with a sufficiently large sample size should be undertaken in order to determine the safety of the rapid injection method for administering famotidine to patients in ICUs.

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