Meta-analysis of randomized clinical trials comparing lansoprazole with ranitidine or famotidine in the treatment of acute duodenal ulcer

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Authors’ objectives
To compare the clinical efficacy of lansoprazole with the efficacies of ranitidine and famotidine.

Searching
The trials were identified using a MEDLINE search, a review of gastroenterology journals and from the files of two pharmaceutical companies (Houde and Takeda).

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were included.

Specific interventions included in the review
Lansoprazole at the usual dose of 30 mg compared with famotidine (40mg) or ranitidine (300 mg).

Participants included in the review
Patients with endoscopically demonstrable acute duodenal ulceration were included.

Outcomes assessed in the review
The outcomes assessed were the endoscopic healing rates at 2 and 4 weeks, and the percentage of patients without pain at 2 and 4 weeks.

How were decisions on the relevance of primary studies made?
Independent assessment by two observers with any disagreements resolved by consensus. The decision regarding inclusion or exclusion was not related to trial results.

Assessment of study quality
The methodological quality of each trial was assessed using a 14-item questionnaire, and scored between -2 and 26 points. Independent assessment by two observers with any disagreements resolved by consensus.

Data extraction
Independent assessment by two observers with any disagreements resolved by consensus. The data were extracted for analysis according to the intention-to-treat method.

Methods of synthesis
How were the studies combined?
For each drug and evaluative end point the following statistical methods were used: comparison of end point improvement with that in control groups using the methods of Peto and DerSimonian and Laird. P<0.05 was considered statistically-significant and every estimate was given with its 95% confidence interval. Meta-analysis was performed with stratification according to the H2-blockers utilised (ranitidine or famotidine). Comparison of the improvement in each end point with the status of the control groups was assessed using the chi-squared test.

How were differences between studies investigated?
Sensitivity analysis was performed by stratification according to the H2-blocker using the Peto and DerSimonian methods. The mean estimates in different subgroups were compared using their 95% confidence intervals.
Results of the review

Five randomised trials examining a total of 848 patients were included.

Healing at 4 weeks: There was a significant difference in favour of lansoprazole over ranitidine or famotidine. Mean difference of 10% (85% compared with 75%, P<0.01). DerSimonian and Laird method: rate difference = 0.100 (P<0.01). Homogeneity P=0.39. Peto's method: difference in rates between lansoprazole and an H2-blocker showed an odds ratio of 2.27 (P<0.01).

Healing at 2 weeks: lansoprazole was found to be significantly more effective than rantidine or famotidine. The mean difference was 20% (60% compared with 40%) DerSimonian and Laird: rate difference = 0.199 (P<0.01). Peto's method: odds ratio 2.26 (P<0.01).

No pain at 4 weeks: No significant difference between lansoprazole and the H2- blockers was found. DerSimonian and Laird: rate difference = 0.001 (P=0.94). Peto's method: odds ratio 1.01 (P=0.96).

No pain at 2 weeks: The percentage of patients free of pain at 2 weeks showed a significant difference in favour of lansoprazole by a mean value of 8% (P<0.02). DerSimonian and Laird: rate difference = 0.081 (P=0.02). Peto's method: odds ratio 1.73 (P<0.01).

Authors' conclusions

The efficacy of lansoprazole was greater than that of ranitidine or famotidine in producing healing of duodenal ulcers at 2 and 4 weeks. Lansoprazole also produced a greater reduction in the percentage of patients free of pain at 2 weeks.

CRD commentary

Indirect comparisons of 4-week healing rates for omeprazole, nizatidine, cimetidine and sucralfate were made. These results have not been presented here as the quality of the meta-analyses used to obtain this data has not been assessed. It is unclear whether all relevant studies have been identified, no search terms or dates were given for the search strategy. It should be noted that the review was sponsored by a pharmaceutical company selling lansoprazole.

Funding

Houde Pharmaceutical Company.

Bibliographic details


PubMedID

8590162

Indexing Status

Subject indexing assigned by NLM

MeSH

2-Pyridinylmethylsulfinylbenzimidazoles; Acute Disease; Anti-Ulcer Agents /therapeutic use; Duodenal Ulcer /drug therapy; Famotidine /therapeutic use; Histamine H2 Antagonists /therapeutic use; Humans; Lansoprazole; Omeprazole /anlogs & derivatives /therapeutic use; Proton Pump Inhibitors; Ranitidine /therapeutic use; Time Factors; Wound Healing

AccessionNumber
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.