Intranasal corticosteroids versus topical H1 receptor antagonists for the treatment of allergic rhinitis: a systematic review with meta-analysis

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Authors' objectives
To compare the effectiveness of intranasal corticosteroids with topical antihistamines for the treatment of allergic rhinitis.

Searching
MEDLINE (from 1966 to 2001), EMBASE (from 1980 to 2001), CINAHL (from 1982 to 2001) and the Cochrane Library (Cochrane Database of Systematic Reviews, DARE and the Cochrane Controlled Trials Register) were searched for studies in the English language; the search terms were given. Additional studies were identified by searching the bibliographies of retrieved articles and through contact with pharmaceutical companies.

Study selection
Study designs of evaluations included in the review
Single- or double-blind randomised controlled trials (RCTs) were eligible for inclusion.

Specific interventions included in the review
Studies that compared intranasal corticosteroids with topical antihistamines were eligible for inclusion. The intranasal corticosteroids evaluated in the included studies were beclomethasone, budesonide, fluticasone and flunisolide. The topical antihistamines evaluated in the included studies were azelastine and levocabastine. The duration of treatment ranged from 2 to 8 weeks. Studies that evaluated oral antihistamines or topical mast cell stabilisers were excluded.

Participants included in the review
Studies of participants with allergic rhinitis were eligible for inclusion. The participants in the included studies had seasonal or perennial rhinitis. The age of the participants ranged from 18 to 73 years (mean 30).

Outcomes assessed in the review
Studies that evaluated nasal symptoms (including total nasal symptom scores), eye symptoms, global symptom evaluation of quality of life and side-effects were eligible for inclusion. Studies that reported only nasal challenge with specific allergens or non-clinical outcomes were excluded. The review also assessed adverse events.

How were decisions on the relevance of primary studies made?
Two reviewers independently selected the articles for inclusion and resolved any disagreements by consensus.

Assessment of study quality
The authors assigned a quality score to each study (1 being the lowest and 5 the highest) using the Jadad instrument to assess randomisation, blinding and withdrawals. The authors did not state how the papers were assessed for quality, or how many reviewers performed the quality assessment.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data on each outcome were extracted from the individual studies and were used to calculate a standardised mean difference (SMD) and 95% confidence interval (CI).

Methods of synthesis
How were the studies combined?
The results from individual studies were combined using a fixed-effect meta-analysis if the studies were sufficiently similar. A pooled SMD and 95% CI was calculated separately for each outcome. The authors assumed that a small effect was 0.2, a medium effect was 0.5 and a large effect was 0.8 or greater, according to the guidelines of Cohen.

How were differences between studies investigated?
Statistical tests of homogeneity were performed using the method of DerSimonian and Laird (significance level, P=0.1). Subgroup analyses were performed to explain sources of heterogeneity. A sensitivity analysis was used to investigate the impact of trial quality (Jadad score less than 3 versus at least 3) and rhinitis subtype (seasonal versus perennial) on the robustness of the results.

Results of the review
Nine RCTs (n=648) were included in the review.

The quality scores assigned to the included studies ranged from 2 to 5.

Total nasal symptom score (6 RCTs, n=346).

Intranasal corticosteroids were associated with a significantly greater reduction in total nasal symptoms than topical antihistamines (SMD 0.36, 95% CI: -0.57, -0.14, P=0.0001). No evidence of statistical heterogeneity was found (P=0.26). A sensitivity analysis on study quality found that the difference was significant in higher quality studies (5 RCTs; SMD -0.42, 95% CI: -0.63, -0.2, P=0.002), but not in the lower quality studies (4 RCTs; SMD 0.55, 95% CI: -0.53, 1.62, P=0.3). An analysis according to rhinitis subtype found the difference was significant in patients with seasonal rhinitis (SMD -0.38, 95% CI: -0.64, -0.13, P=0.003), but not in patients with perennial rhinitis (SMD -0.33, 95% CI: -0.73, 0.07, P=0.1).

Nasal symptoms.

Intranasal corticosteroids were associated with significantly greater relief of sneezing in comparison with topical antihistamines (SMD -0.41, 95% CI: -0.57, -0.24, P=0.0001), based on 594 patients in 7 RCTs; there was evidence of statistical heterogeneity (P=0.002). They were also associated with a significant decrease in rhinorrhoea in comparison with topical antihistamines (SMD -0.47, 95% CI: -0.64, -0.29, P=0.0001), based on 523 patients in 6 RCTs; there was evidence of statistical heterogeneity (P=0.01).

Intranasal corticosteroids were associated with significantly greater relief of nasal itch in comparison with topical antihistamines (SMD -0.38, 95% CI: -0.56, -0.19), based on 460 patients in 5 RCTs; there was evidence of statistical heterogeneity (P=0.03). They were also associated with significantly greater relief of nasal blockage in comparison with topical antihistamines (SMD -0.86, 95% CI: -1.07, -0.64), based on 376 patients in 4 RCTs; there was no evidence of statistical heterogeneity (P=0.15).

Eye symptoms (4 RCTs, n=428).

No significant difference was found between intranasal corticosteroids and topical antihistamines for ocular symptoms (SMD -0.07, 95% CI: -0.27, 0.12, P=0.4); there was evidence of statistical heterogeneity (P=0.0001).

Nasal congestion (2 RCTs, n=52). No significant difference was found between intranasal corticosteroids and topical antihistamines for nasal congestion (SMD -0.01, 95% CI: -0.56, 0.53, P=0.9); there was no evidence of statistical heterogeneity (P=0.3).

Adverse effects (4 RCTs, n=526).

A low incidence of mild to moderate adverse events was reported. No difference between the treatment groups was observed.
Authors' conclusions
Intranasal corticosteroids produced greater nasal symptom relief than topical antihistamines. No difference in the relief of ocular symptoms was found.

CRD commentary
The review addressed a clear research question and the inclusion criteria appeared appropriate. Several sources were used to identify relevant trials, although unpublished studies and non-English language studies were not included in the review. Therefore, the possibility of publication and language bias cannot be ruled out. Methods were used to minimise bias in the selection of studies for inclusion. However, the methods used to abstract the data were not reported, thus the possibility of reviewer bias and error cannot be assessed. The quality of the included studies was assessed systematically and used to test the robustness of the results in sensitivity analyses.

Adequate details on the results of each included study were given. The decision to statistically pool might not have been appropriate for some of the outcomes, owing to statistical heterogeneity. However, the authors appropriately explored possible causes of heterogeneity when detected. The authors’ conclusions appear to follow from the evidence presented, although it is possible that some studies might have been overlooked by the search.

Implications of the review for practice and research
Practice: The authors stated that intranasal corticosteroids can be used as first-line treatment in patients with allergic rhinitis.

Research: The authors did not state any implications for further research.

Bibliographic details
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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.