Efficacy of desloratadine in the treatment of allergic rhinitis: a meta-analysis of randomized, double-blind, controlled trials

Canonica G W, Tarantini F, Compalati E, Penagos M

CRD summary
This generally well-conducted review evaluated the effectiveness of desloratadine in the treatment of allergic rhinitis. The authors concluded that desloratadine was associated with significant beneficial effects on symptoms of allergic rhinitis as well as objective measures of nasal blockage and allergic inflammation. The conclusions are consistent with the results reported and are likely to be reliable.

Authors' objectives
To evaluate the efficacy of desloratadine, a non-sedative antihistamine, in the treatment of allergic rhinitis.

Searching
MEDLINE, EMBASE, LILACS and CINAHL were searched from 1966 to May 2006 without any language restrictions; the search terms were reported. The reference lists of identified articles and review articles were also screened to identify additional studies, as were abstracts of relevant meetings.

Study selection
Study designs of evaluations included in the review
Double-blind randomised controlled trials (RCTs) were eligible for inclusion. The reviewers stated in the text that they included parallel-group RCTs, but crossover RCTs were also included.

Specific interventions included in the review
Trials that compared oral desloratadine (any dose and any duration of treatment) with placebo or other antihistamines were eligible for inclusion. The included trials compared oral desloratadine (5mg/day to 20mg/day) with placebo, levocetirizine or fexofenadine. The median duration of treatment was two weeks. Three trials treated patients with single doses; in other trials, the duration of treatment varied from one to four weeks. Four trials used desloratadine in the setting of a post-experimental challenge with allergens.

Participants included in the review
Trials of participants with a history of allergic rhinitis in which the causal allergen was identified and immunoglobulin E (IgE) sensitisation was proven by skin prick test and/or specific IgE assays were eligible for inclusion. Trials of desloratadine that included patients with allergic asthma or conjunctivitis were eligible only if the results for patients with allergic rhinitis were analysed separately. The median age of the participants was 32 years (range 12 to 65 years).

Outcomes assessed in the review
The review assessed total symptom scores, total nasal symptom scores, nasal eosinophils, nasal airflow and nasal interleukin-4 (IL-4) levels.

In the included trials, symptom scores were most commonly defined as the average of the daily assessment of symptoms entered in the patient's diary. Nasal airflow was measured by active anterior rhinomanometry. IL-4 levels were measured using an enzyme-linked immunosorbent assay on nasal lavage fluid, and cytology for eosinophils was done on nasal lavage fluid using light microscopy.

How were decisions on the relevance of primary studies made?
Two investigators independently assessed trials for inclusion. The principal investigator checked their assessment. Interrater agreement on study eligibility was good.

Assessment of study quality
Trial quality was assessed using the method of Jadad, which evaluates randomisation, blinding, and the reporting of drop-outs and withdrawals. Two authors independently assessed the quality of the included trials. Inter-rater agreement
was good.

**Data extraction**

Two reviewers independently extracted the data and any disagreements were resolved by consensus. When results were only presented in graphs, they were digitised and then converted into numbers using software. The original investigators were contacted to obtain additional information. Where possible, longitudinal data for drop-outs were dealt with using a 'last observation carried forward' strategy. Standard mean deviation (SMD) and 95% confidence intervals (CIs) were calculated.

**Methods of synthesis**

**How were the studies combined?**

The trials were pooled in a meta-analysis using a random-effects model to obtain an SMD and 95% CI. Weighted mean differences with 95% CIs were calculated where studies used a common scale.

**How were differences between studies investigated?**

χ² and \( I^2 \) were used to investigate heterogeneity. Subgroup analyses were carried out in which data were pooled separately for studies using desloratadine in the setting of post-allergen challenge, and trials which used it as a treatment for allergic rhinitis.

**Results of the review**

Thirteen RCTs (3,108 patients) were included in the review, comprising seven parallel-group and six crossover design trials. Ten trials scored 5 out of 5 points for quality; three trials scored 4 points. The drop-out rates ranged from 0 to 14%.

**Symptom scores**

Desloratadine was associated with a statistically significant reduction in total symptom scores compared with placebo for all studies (SMD -1.63, 95% CI: -2.75, -0.51, p=0.004), for patients studied in a clinical treatment setting (SMD -1.79, 95% CI: -3.10, -0.47, p=0.008; 2,928 patients), and for patients studied in the post-allergen challenge setting (SMD -0.98, 95% CI: -1.29, -0.67; 180 patients).

Desloratadine was associated with a statistically significant reduction in nasal symptom score compared with placebo (SMD -0.66, 95% CI: -0.91, -0.42, p<0.001; 2,883 patients).

**Objective measures of nasal obstruction**

Desloratadine was associated with a statistically significant improvement in nasal airflow compared with placebo for all studies (SMD 0.32, 95% CI: 0.10, 0.55, p=0.005; 438 patients) and for patients studied in a clinical treatment setting (SMD 0.58, 95% CI: 0.01, 1.15; n=258). For patients studied in a post-allergen challenge setting the difference in nasal airflow between desloratadine and placebo was not statistically significant (SMD 0.24, 95% CI: -0.06, 0.53; 180 patients).

**Inflammatory markers**

Desloratadine was associated with a statistically significantly lower number of nasal eosinophils compared with placebo (SMD -1.28, 95% CI: -2.57, 0.01, p=0.05; n=133).

There was no statistically significant difference in nasal IL-4 levels between the desloratadine and placebo groups (SMD -2.18, 95% CI: -5.01, 0.64, p=0.13; n=88).

There were no statistically significant differences between desloratadine and levocetrizine for the outcomes of total nasal symptom scores, nasal eosinophils and nasal IL-4 levels. However, the sample size was very small (88 patients).

There was evidence of significant statistical heterogeneity (\( I^2 \) ranged from 0 to 99.3% for various outcomes).
Authors' conclusions
There were significant beneficial effects of desloratadine on the symptoms of allergic rhinitis as well as objective measures of nasal blockage and, to some extent, allergic inflammation.

CRD commentary
The review addressed a well-defined question in terms of the participants, intervention and outcomes. Relevant databases were searched without language restrictions, thereby reducing the risk of language bias. However, some relevant studies might have been missed as no specific attempts were made to identify unpublished studies. The review methods were well-described and included measures to avoid the introduction of bias.

The methodological quality of the included trials was assessed using validated methods. The authors did not describe how the data from crossover trials were handled and combined with the data from parallel-group design trials. Some appropriate subgroup analyses were carried out.

Overall, this was a well-conducted review and the conclusions are likely to be reliable.

Implications of the review for practice and research
The authors did not state any implications for practice or further research.

Funding
ARMIA (Associazione per la Ricerca delle Malattie Immunologiche e Allergiche-Genova); GA2LEN (Global Allergy and Asthma European Network).

Bibliographic details

PubMedID
17362245

DOI
10.1111/j.1398-9995.2006.01277.x

Indexing Status
Subject indexing assigned by NLM

MeSH
Double-Blind Method; Histamine H1 Antagonists, Non-Sedating /therapeutic use; Humans; Hypersensitivity /drug therapy; Loratadine /analogs & derivatives /therapeutic use; Nasal Obstruction /drug therapy; Randomized Controlled Trials as Topic; Rhinitis /drug therapy; Treatment Outcome

AccessionNumber
12007001229

Date bibliographic record published
29/02/2008

Date abstract record published
29/02/2008

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.