Meta-analysis of clinical studies with betahistine in Meniere's disease and vestibular vertigo

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CRD summary
The author concluded that betahistine had a beneficial effect in the treatment of vestibular vertigo or Meniere's disease. Given the substantial limitations and uncertainties in the review processes and findings, the treatment effect may have been overestimated. The author's conclusions cannot, therefore, be considered to be reliable.

Authors' objectives
To assess the effectiveness of betahistine in the treatment of vestibular vertigo or Meniere's disease.

Searching
MEDLINE, EMBASE, BIOSIS, SciSearch, and Derwent Drug File were searched for publications in any language up to February 2012. Attempts were made to obtain published or unpublished data from Abbott Pharmaceuticals.

Study selection
Eligible for inclusion were randomised controlled trials (RCTs) assessing the effectiveness of betahistine in patients diagnosed with vestibular vertigo or Meniere's disease. Trials could have parallel or cross-over designs, as long as they were placebo-controlled and double-blind. The outcome of interest was the investigator's overall opinion on the response after at least one month of treatment.

The included trials were completed between 1966 and 2010. The total daily dose of betahistine hydrochloride or dihydrochloride ranged from 16mg to 48mg. Treatment lasted from 14 days to three months. The scales used to measure the investigator's overall judgement on treatment effectiveness differed across trials; with the categories on the scales ranging from two to seven (reported as eight in the text).

The author did not state how many reviewers screened studies for inclusion.

Assessment of study quality
The author did not state that an assessment of trial quality was undertaken.

Data extraction
The overall judgements of the investigator, on the change from baseline, in the effectiveness of treatment (where reported), were extracted on a per-protocol basis. Treatment response categories were combined, using published methods, and used to estimate odds ratios and 95% confidence intervals that reflected the probability of treatment improvement or no improvement. Cumulative odds ratios were calculated where possible.

In trials with a cross-over design, only overall judgements from the first treatment period were extracted. Where patients withdrew due to a lack of treatment efficacy, imputation was used. One trial that had scale categories with no events was included in the meta-analysis; others were not because their treatments were short-term.

The author did not state how many reviewers extracted the data.

Methods of synthesis
Odds ratios and 95% confidence intervals were combined using a DerSimonian and Laird fixed-effect model, where there was judged to be little heterogeneity, or otherwise a random-effects model.

Subgroups by medical condition (Meniere's disease or vestibular vertigo) were analysed.

Results of the review
Fourteen RCTs (1,028 patients; range 10 to 236; reported as 1,038 patients in the text) were included in the review; 10 trials were parallel and four were cross-over.
Using a random-effects model, betahistine had a statistically significant positive effect on patients with vestibular vertigo or Meniere's disease, compared with patients receiving placebo (OR 2.58, 95% CI 1.67 to 3.99; 12 RCTs). The forest plot suggested heterogeneity between trials.

Subgroup analysis indicated statistically significant benefit, with betahistine, for each medical condition (reported in the review).

**Authors' conclusions**
The evidence supported the therapeutic benefit of betahistine for both Meniere's disease and vestibular vertigo.

**CRD commentary**
The review question and supporting inclusion criteria were clearly stated. A satisfactory search of the literature was undertaken, with attempts to locate both published and unpublished data. All of the included studies were RCTs, but their quality was not assessed. The author did not state how many reviewers were involved in each stage of the review process, which means that reviewer error and bias cannot be ruled out.

The patient characteristics were not reported, making it unclear how comparable patients were across trials. Samples were small, there were considerable differences in the trial methods, and the outcomes were subjective and open to bias. The treatments were short term. It was unclear if the methods used to combine and impute the data were appropriate, and what effect they might have had on the overall estimates of effect. The forest plots displayed very wide confidence intervals for some trials, which indicates imprecision.

There were substantial limitations to the review, and there was little evidence, which was varied. Given these limitations, the treatment effect may have been overestimated. The author's conclusions cannot, therefore, be considered to be reliable.

**Conflict of Interests:** The author was an employee of Abbott, a manufacturer of betahistine.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
23778722

**DOI**
10.1007/s00405-013-2596-8

**Other publications of related interest**
**Practice:** The author stated that betahistine was safe and effective for the treatment of vertigo or Meniere's disease.

**Research:** The author did not state any implications for research.

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Betahistine /adverse effects /therapeutic use; Double-Blind Method; Humans; Meniere Disease /diagnosis /drug therapy; Odds Ratio; Randomized Controlled Trials as Topic; Treatment Outcome; Vasodilator Agents /adverse effects /therapeutic use

**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.