Behavioral treatments of chronic tension-type headache in adults: are they beneficial?
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CRD summary
The authors concluded that there were no indications that relaxation, electromyographic biofeedback or cognitive behavioural therapy were better than attentional or waiting list control in improving headaches in patients with tension-type headaches. This was a generally well-conducted review and, given the poor quality of the available trials, the authors' cautious conclusions are justified.

Authors' objectives
To evaluate the effectiveness of behavioural interventions in the treatment of chronic tension-type headache in adults.

Searching
MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL) and CINAHL were searched from inception to October 2007 for articles in any language. Search terms were reported. References of relevant reviews and identified articles were also searched.

Study selection
Randomised controlled trials (RCT) of behavioural interventions compared with no treatment, waiting list or other treatment, used in the treatment of adults, aged 18 years or over, with chronic or episodic tension-type headaches, were eligible for inclusion. The definition of tension-type headache should be based on some distinctive features of tension-type headache and should differentiate from migraine. Outcome measures eligible for inclusion were headache intensity, frequency, duration, improvement or index. No language restrictions were applied.

Included trials evaluated cognitive behavioural therapy, stress management therapy, electromyographic biofeedback training or relaxation training, with mean treatment duration of 7.7 weeks, in patients with chronic tension-type headaches. Four trials used the International Headache Society criteria and 16 trial used the Ad Hoc Committee's criteria to classify chronic tension-type headaches; the remaining trials used varying definitions. Comparison conditions were placebo relaxation, pseudo-biofeedback, placebo medication, self-monitoring control, no treatment or waiting list control group. Where stated, the mean age of participants ranged from 18.7 years to 40.2 years. All included trials assessed headache duration, intensity or duration, using a Likert scale in a headache diary. Most trials amalgamated these outcomes into a headache improvement index. Other outcomes reported in the review were analgesic use, depression, anxiety, electromyograph levels and adverse events.

Two reviewers independently selected the studies for review, with disagreements resolved by consensus or arbitration with a third reviewer.

Assessment of study quality
The methodological quality of the included trials was assessed using the Delphi List, a nine item checklist assessed blinding, allocation concealment, randomisation, inclusion criteria, comparability of groups at baseline, intention-to-treat analysis and inclusion of point estimates, and measures of variability. An additional criterion of withdrawal/drop-out rate was also added. Each trial was awarded a score between 0 and 10; trials with scores of 6 points or more were considered to have a low risk of bias.

The validity assessment was carried out independently by two reviewers, with disagreements resolved by consensus or arbitrated with a third reviewer.

Data extraction
Data were extracted to enable the calculation of mean differences for continuous data and relative risks (RR) for dichotomous data with 95% confidence intervals (CI) for each trial.
Data were extracted by one reviewer and checked by a second reviewer, with disagreements resolved by consensus.

Methods of synthesis
The trials were combined in a narrative synthesis and interpreted using different levels of evidence. Evidence was considered to be strong when multiple trials with low risk of bias produced consistent findings. Evidence was considered to be moderate if one low risk of bias RCT or multiple high risk of bias RCTs produced significant results. Evidence was considered to be weak if only one RCT reported findings and inconsistent when multiple trials reported conflicting findings. Sensitivity analyses were performed in trials with adequate power (more than 25 participants in each arm), using International Headache Society or Ad Hoc Committee criteria for diagnosis of chronic tension-type headaches and trials with low risk of bias.

Results of the review
Forty-four RCTs were included in the review (n=2,618 participants), but only 29 RCTs included sufficient data on outcomes (n=1,768 participants). Five trials scored 6 or more out of 10 points on the validity assessment. The main methodological weaknesses observed in the included trials were unclear allocation concealment, lack of blinding of treatment provider, failure to use intention-to-treat analyses and lack of statistical power.

Relaxation
(21 RCTs with outcome data, n=1,069 participants): One RCT with a low risk of bias found a significant improvement in headaches in patients treated with relaxation compared to waiting list and placebo (SMDs ranging from 0.76 to 2.26; n=68 participants), but four trials found no significant differences between relaxation and attentional/placebo control. No significant differences were observed between autogenic relaxation and self-hypnosis or hypnotic imagery (three RCTs; n=200 participants), galvanic skin response feedback (one RCT; n=31 participants), biofeedback (two RCTs; n=84 participants) and rational emotive therapy (one RCT; n=48 participants).

Electromyographic biofeedback treatment
(four RCTs with sufficient outcome data, n=455 participants): One RCT (n=375 participants) found that biofeedback significantly improved headache compared to controls (SMD 4.14, 95% CI 3.28 to 4.99), but that it was significantly less effective than amitriptyline and propranolol in improving headaches. There were no statistically significant differences in headache improvement between the different forms of electromyograph (two RCTs, n=51 participants) or between electromyographic biofeedback and diazepam (one RCT; n=36 participants). One RCT found that relaxation and electromyographic biofeedback combined significantly improved headaches compared to an attentional placebo control (SMD 0.83, 95% CI 0.18 to 1.47; n=45 participants).

Cognitive behavioural therapy
(four RCTs with sufficient data, n=430 participants): There were no significant differences between cognitive behavioural therapy and placebo or amitriptyline on headache improvement. Cognitive behavioural therapy as an adjunct to relaxation therapy did not significantly improve headache outcomes (four RCTs, n=186 participants).

Authors' conclusions
There were no indications that relaxation, electromyographic biofeedback or cognitive behavioural therapy were better than attentional or waiting list control in improving headaches in patients with tension-type headaches.

CRD commentary
The review addressed a clear question with well-defined inclusion criteria. Several relevant databases were searched for articles in any language, minimising the risk of language bias. However, attempts did not appear to have been made to identify unpublished data, so publication bias cannot be ruled out. Appropriate steps were taken throughout the review process to minimise the risk of reviewer error and bias. A suitable validity assessment was carried out. The decision to combine the trials in a narrative synthesis was appropriate given the high level of clinical heterogeneity between the included trials. This was a generally well-conducted review and, given the poor quality of available trials, the authors' cautious conclusions are justified.

Implications of the review for practice and research
Practice: The authors stated that in the absence of a clear evidence-base for behavioural interventions for tension-type headaches, clinicians should rely on their clinical expertise. However, relaxation combined with electromyographic...
Biofeedback is the most promising treatment option.

**Research:** The authors stated that large, methodologically sound studies should be conducted to investigate relaxation or biofeedback for tension-type headaches using International Headache Society diagnostic criteria and adhering to the CONSORT (Consolidated Standards of Reporting Trials) guidelines.

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