Valerian for sleep: a systematic review and meta-analysis
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CRD summary
This review concluded that valerian might improve sleep quality without producing negative side-effects. The limited number of small, varied and often poor-quality studies on which this conclusion relies suggests that the findings might not be reliable.

Authors' objectives
To determine the efficacy of valerian to improve sleep quality.

Searching
PubMed, EMBASE, IBIDS, BIOSIS Previews and the Cochrane Library were searched for relevant articles through to June 2005; the search terms were reported. No language restrictions were applied.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion in the review. One study was a combination of multiple n-of-1 trials.

Specific interventions included in the review
Studies that compared valerian with placebo were eligible for inclusion. The dosage ranged from 225 to 1,215 mg (extract or dried root) and only 1 study used a standardised valerian extract. At least 2 studies included additional supplements: one each of 'other herbs' or 80 mg lemon balm extract. Where reported, treatment duration ranged from 1 to 30 days.

Participants included in the review
No a priori criteria were reported. The participants included adults with chronic insomnia, adults with anxiety and insomnia, geriatric in-patients with sleep disturbance, non-organic insomnia requiring medication, elderly patients with a nervous impairment, patients with minor anxiety or emotional tension, healthy volunteers (with and without sleep onset insomnia or poor sleepers) and children with intellectual deficits. Where reported, the mean age of the participants ranged from 11 to 79 years.

Outcomes assessed in the review
Studies that reported some measure of sleep quality were eligible for inclusion. All included studies utilised a subjective measure of sleep quality, with most studies using a simple dichotomous assessment of sleep improvement (improved, not improved). Other measures included a visual analogue scale, the St. Mary's Hospital Sleep Questionnaire, the proportion of treatment success, hangover effect of treatment, subjective sleep latency, polysomnographic variables and adverse events.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection. Relative risks (RRs) with corresponding 95% confidence intervals (CIs) were calculated.

Assessment of study quality
Two reviewers independently assessed the quality of the primary studies using the Jadad scale. The studies were given a score of 0 to 5, with higher scores indicating better quality studies.
Data extraction
Two reviewers independently extracted the data from the primary studies.

Methods of synthesis
How were the studies combined?
The studies were combined in a meta-analysis, using a random-effects model for dichotomous outcome of sleep quality; pooled RRs with 95% CIs were reported. Where a meta-analysis was not possible, the studies were combined in a narrative.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the Q statistic. Differences between the individual studies were also highlighted in the body of the text and the summary tables.

Results of the review
Sixteen RCTs (n=1,093) were included in the review.

The average Jadad score for quality was 3.4 (range: 2 to 5).

A significant improvement with valerian compared to placebo was found for the dichotomous measure of sleep quality (RR 1.8, 95% CI: 1.2, 2.9), based on 6 RCTs. Evidence of statistical heterogeneity was found. The removal of 1 trial in which patients had been recruited through the Internet did not significantly change the treatment effect; no evidence of statistical heterogeneity was found.

Seven studies assessed sleep quality using a visual analogue scale, of which five found no statistically significant benefit of valerian. Four studies reported results on subjective sleep onset latency: two found a significant improvement in favour of valerian (16.7 and 14 minutes) and two found no significant differences between the treatment groups. No between-group differences were found for hangover effect the morning after study medication was given (6 studies) or polysomnographic data (5 studies). Adverse effects were not consistently reported: 5 studies reported no adverse events, while 8 studies reported a variety of events experienced by both groups. One study reported a statistically significant increase in diarrhoea in the valerian group compared with placebo. Examination of the funnel plot and Kendall's tau indicated evidence of publication bias (p=0.03).

Authors' conclusions
The available evidence indicates that valerian might improve sleep quality without producing negative side-effects.

CRD commentary
The review question was clearly stated, apart from participant eligibility. A wide range of sources was searched, but the authors made no attempts to locate unpublished data and evidence for publication bias was found when assessed. Appropriate review methods were used to reduce error and bias in the quality assessment and data extraction, but it is unclear whether similar methods were undertaken at the study selection stage.

The variation in participant characteristics, valerian doses, preparations, length of treatment and outcome assessment might indicate that a narrative synthesis is most appropriate. The authors also highlighted a number of limitations, including the poor reporting of the severity of insomnia in the included participants. In addition, only 1 study used a standardised valerian extract and most studies did not have sufficient power to rule out even relatively common side-effects. Given these considerations, the authors' conclusion may be overstated.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.
Research: The authors stated that future studies should use standardised outcome measures and preparations of valerian. They also stated that future studies should assess the effect of different dosages and preparations.

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