Effect on quality of life of continuous positive airway pressure in patients with obstructive sleep apnea syndrome: a meta-analysis

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CRD summary
This review evaluated the effects on quality of life of continuous positive airway pressure (CPAP) in patients with obstructive sleep apnoea syndrome. This meta-analysis shows that CPAP did not improve general quality of life score but did improve physical domains and vitality. Overall, the authors’ conclusions reflect the evidence presented and are likely to be reliable.

Authors’ objectives
To determine the effect of continuous positive airways pressure (CPAP) in the treatment of obstructive sleep apnoea syndrome on quality of life.

Searching
MEDLINE (1966 to June 2007), EMBASE (1966 to June 2007), the Cochrane Central Register of Controlled Trials (CENTRAL) (through to second quarter of 2007) and the website ClinicalTrials.gov was searched to identify studies published in English. Search terms were reported. Bibliographies of all retrieved articles were also handsearched.

Study selection
Eligible for inclusion in the review were all prospective randomised controlled trials in adults that compared continuous positive airways pressure (CPAP) treatment for obstructive sleep apnoea syndrome with a control. Eligible trials were required to use validated tools for quality of life measurements. Trials where outcomes of the comparison were not reported, or where it was not possible to extract data from published results, were excluded.

Both parallel RCTs and cross over RCTs were included in the review. Comparators were conservative treatment, sham CPAP or oral placebo. Duration of treatment ranged from three to 24 weeks. Validated measures included: Short Form 36 (SF-36), Nottingham Health Profile (NHP), Functional Outcomes of Sleep Questionnaire (FOSQ), European Quality of Life Questionnaire (EuroQol) and Sleep Apnoea Quality of Life Index (SAQLI). The mean Epworth Sleepiness Scale (ESS) ranged from 7 to 16.5. Severity of obstructive sleep apnoea syndrome ranged from five to more than 30. Mean/median apnoea-hypopnoea index (AHI) ranged from 10 to 56. Where reported, mean age ranged from 44 to 61 years.

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The quality of the trials was assessed using the criteria of generation of allocation sequence, allocation concealment, investigator blindness, description of withdrawal or drop-outs, and efficacy of randomisation. Trials scoring six or more were determined to be of high quality.

Two independent reviewers performed the study quality assessment. The authors did not state how disagreements were resolved.

Data extraction
Data were extracted in order to calculate weighted mean differences and 95% confidence intervals (95% CI) for individual domain outcomes and overall scores for each of the validated quality of life measures.

Methods of synthesis
Meta-analyses were performed; the weighted mean difference (WMD) was calculated for each domain and the overall score for each validated quality of life measure. Heterogeneity was assessed using the $X^2$ test and Fisher exact tests. Heterogeneity was assessed by stratified meta-analysis according to quality score, control type, duration of treatment, study design, and severity of of obstructive sleep apnoea syndrome. Meta-regression was used to investigate sources of
heterogeneity. Covariates in the meta-regression included study duration, quality score, mean apnoea-hypopnoea index score and mean Epworth Sleepiness Scale score. Publication bias was assessed using funnel plots and the Egger's test.

Results of the review
Seventeen RCTs (n=1,256 patients) were included in the review. The sample sizes ranged from 32 to 160. Six trials were determined to be of high quality. Publication bias was not statistically significant.

General quality of life score: Compared to comparator, continuous positive airways pressure (CPAP) caused a statistically significant improvement in general quality of life scores for the Nottingham Health Profile (WMD 1.657, 95% CI -3.005 to -0.308) and in the Sleep Apnoea Quality of Life Index (WMD=0.900, 95% CI 0.625 to 1.175). However, there was no statistically significant difference in general quality of life scores for the other quality of life measures.

Individual domains and subgroup analysis: Compared to comparator, patients undergoing treatment with CPAP scored better for the Short Form 36 individual domains in: physical function (WMD 3.457, 95% CI 0.144 to 6.771); body pain (WMD 4.017, 95% CI -0.008 to 8.042); energy vitality (WMD 6.984, 95% CI 0.557 to 13.411); and physical component summary (WMD 2.040, 95% CI 0.045 to 4.035). Meta-regression analyses revealed that only study design and apnoea-hypopnoea index coefficient (AHI) were sources of statistically significant heterogeneity; this was for the physical problems domain (AHI coefficient -1.32, 95% CI -2.37 to -0.30; study design coefficient 52.39, 95% CI 2.55 to 102.22) and the body pain domains (AHI coefficient -0.698, 95% CI -1.39 to -0.01; study design coefficient 36.54, 95% CI 6.60 to 66.49).

Authors' conclusions
This meta-analysis showed that continuous positive airways pressure did not improve general quality of life score but did improve physical domains and vitality.

CRD commentary
This review addressed a clear research question and was supported by detailed inclusion criteria. The search strategy was adequate but was limited to studies published in English, which meant that relevant studies may have been missed. Publication bias was assessed and was reported to be absent. Adequate details of included trials were provided and synthesis methods were appropriate. The review was carried out with sufficient attempts to minimise bias, but it was unclear how many reviewers performed the study selection. Overall, the authors' conclusions reflect the evidence presented and are likely to be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.
Research: The authors stated that future randomised controlled trials in this area should concentrate on disease -specific questionnaires or on large long term parallel group design.

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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.