**Effectiveness of energy conservation treatment in reducing fatigue in multiple sclerosis: a systematic review and meta-analysis**

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**CRD summary**

This review concluded that energy conservation management for fatigued patients with multiple sclerosis could have greater short-term efficacy in reducing the impact of fatigue and improving quality of life (with better scores on three out of eight questionnaire subscales) than no treatment. The authors’ conclusions may not be sufficiently cautious, although their recommendation for further trials appear appropriate.

**Authors’ objectives**

To assess the effects of energy conservation management treatment for fatigue in multiple sclerosis along with its impact on restrictions in participation and quality of life.

**Searching**

PubMed, CINAHL, EMBASE and Web of Knowledge were searched with no language restrictions up to May 2012. The search strategy was provided. References of identified studies were checked.

**Study selection**

Randomised controlled trials (RCTs) and controlled clinical trials (CCTs) that evaluated the effectiveness of energy conservation interventions or fatigue management in patients with any form of multiple sclerosis were eligible for inclusion. Programmes could use any approach with no restrictions on intensity or method of delivery. Multidisciplinary fatigue management interventions were eligible if they included clearly defined energy/fatigue management techniques. Any type of comparator was acceptable. Trials had to report perceived or subjective fatigue. Perceived restrictions in social participation or quality of life were secondary outcomes.

The included trials used the Fatigue Impact Scale (FIS) and the short-form health survey (SF-36) to assess outcomes. There was variation in the included populations, in particular in the type of multiple sclerosis. In some trials most patients had relapsing-remitting disease; other trials contained only a minority of such patients, while one trial enrolled only patients with secondary progressive disease. Disability (as assessed by various scales) also varied, where it was reported.

Two reviewers independently selected the studies for the review; disagreements were resolved through discussion or by a third reviewer.

**Assessment of study quality**

Two reviewers independently assessed the trials for risk of bias using a previously published tool. Criteria were scored as positive, negative or unclear. Trials were considered high quality if they scored “yes” on at least 50% of criteria. Disagreements were resolved through consensus or consultation with a third reviewer.

**Data extraction**

Data based on comparisons between the intervention and control groups were extracted and mean differences with 95% confidence intervals were calculated. Intention-to-treat data were used where possible. Follow-up times were categorised as short-term (close to three months), medium-term (close to six months) or long-term (close to one year). Authors of the included trials were contacted for additional data.

Two reviewers independently extracted the data using a prespecified form; disagreements were resolved through consensus or consultation with a third reviewer.

**Methods of synthesis**

The trials were combined using fixed-effect meta-analyses to calculate weighted mean differences unless significant heterogeneity was detected, in which case a random-effects model was used. Differences between trials were assessed.
using $I^2$; if $I^2$ was above 25%, a random-effects model was used. Where pooling was not possible, trials were reported narratively, taking into account the strength of the evidence for each outcome and comparison.

Results of the review
Six trials with a total of 494 patients were included in the review. All trials had crossover designs; four were RCTs and two were CCTs. All except one trial were considered to be high quality.

Fatigue: A meta-analysis of two high quality RCTs with waiting list control groups found that there were statistically significant benefits for patients undergoing energy conservation management on three Fatigue Impact Scale (FIS) subscales: cognitive (WMD -2.91, 95% CI -4.32 to -1.50), physical (WMD -2.99, 95% CI -4.47 to -1.52), and psychosocial (WMD -6.05, 95% CI -8.72 to -3.37). However, there were no significant differences for two different fatigue severity scores in two other trials between intervention and control groups. There was also evidence from a small high-quality CCT that scores on these scales and overall scores improved significantly more with energy conservation management than with a support group at eight weeks. There was no evidence that multi-disciplinary fatigue management programmes were more effective than placebo for any fatigue-related outcome at seven and 28 weeks follow-up. One trial evaluated participation and found no differences between intervention and control groups.

Quality-of-life: A meta-analysis of two trials found greater efficacy for energy conservation management than no treatment on three SF-36 subscale roles in the short term: physical role functioning (WMD 17.26, 95% CI 9.69 to 24.84), social functioning (WMD 6.91, 95% CI 1.32 to 12.49) and mental health (WMD 5.55, 95% CI 2.27 to 8.83). However, no difference was found for five other subscale roles: physical functioning, bodily pain, general health, vitality, and emotional role functioning.

There was no evidence of statistical heterogeneity in any of the meta-analyses.

Authors’ conclusions
In the short-term, energy conservation management for fatigued patients with multiple sclerosis could be more effective than no treatment in reducing the impact of fatigue and improving scores on three quality of life scales: physical role functioning, social function, and mental health.

CRD commentary
The review addressed a clear question which was supported by specific inclusion criteria. The search was thorough. The risk of bias in the included studies was assessed and results were fully reported. The authors used methods designed to reduce reviewer error and bias at all stages of the review process.

There were concerns about study quality, notably due to lack of blinding of participants, care providers, and outcome assessors. In addition, the authors did not comment on the clinical significance of the results. The number of patients, both overall and in any individual analysis, was low.

The authors’ conclusions may not be sufficiently cautious, although their recommendation for further trials appear appropriate.

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

Research: The authors stated that more RCTs which report longer-term outcomes were required.

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Bibliographic details
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.