Nonpharmacologic strategies for managing common chemotherapy adverse effects: a systematic review

Lotfi-Jam K, Carey M, Jefford M, Schofield P, Charleson C, Aranda S

CRD summary
The authors concluded that although some self-care strategies appeared promising for managing the adverse effects of chemotherapy, the quality of evidence was limited. Further better-designed studies were required. The cautious conclusions appear justified.

Authors' objectives
To evaluate the effectiveness of self-care strategies for managing chemotherapy-related nausea, vomiting, constipation, diarrhoea, fatigue, hair loss and mucositis.

Searching
MEDLINE, CINAHL and PsycINFO were searched for studies published in English in peer reviewed journals from 1980 to August 2007. Search terms were reported. Reference lists of relevant articles were handsearched.

Study selection
Randomised controlled trials of self-care strategies for cancer patients undergoing chemotherapy were eligible for inclusion, provided they focused on preventing or reducing the severity or incidence of nausea/vomiting, constipation, diarrhoea, fatigue, hair loss and/or mucositis. Self-care was defined as a non-pharmacological intervention that could be either patient-initiated or taught by a clinician and subsequently used independently by a patient. Studies solely of pharmacological interventions (including non-prescription treatments) were excluded, with the exception of studies involving mouthwashes for mucositis.

Half the studies in the review included adults only and the rest included children. Around one quarter of studies included solely women with breast cancer. Some studies included patients at various disease stages, but disease stage and time since diagnosis were frequently not reported. Most participants were receiving chemotherapy only, but some studies included patients having other forms of cancer treatment as well. Most studies targeted nausea and vomiting or mucositis. The interventions most commonly investigated were oral hygiene, relaxation and exercise. The following types of interventions were used: acupressure, biofeedback, exercise, diet, cognitive distraction, hypnosis, music therapy, psycho-education, systematic desensitisation, relaxation (guided imagery and progressive muscle relaxation), vitamin E cream, oral hygiene programmes (including mouthwashes), scalp cooling and oral cryotherapy. In most cases (where reported) the interventions were taught by a health professional. Many studies included more than one intervention group. Outcome definitions and measures varied widely. Many studies used researcher-developed measures. Few studies reported the validity or reliability of measures used. Frequency varied widely. Duration of follow up ranged from immediately after treatment to six months after treatment.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
Study validity was assessed using a published rating system (Newell 2002) with 10 items relating to the following factors: allocation concealment, randomisation, blinding, equivalence of groups, loss to follow up and intention to treat analysis. A maximum score of 3 points was allocated for each item. Randomised controlled trials that rated fair (11 to 20 points) or good (21 to 30 points) were included in the review. Additional aspects of methodology and reporting among the included studies were considered (such as use of power calculation, adherence rates). Two researchers independently conducted validity assessment. Discrepancies were resolved by discussion.

Data extraction
Where studies reported significant results (p<0.05), descriptive data were extracted and reported in a table. Two
Researchers independently extracted the data. Discrepancies resolved by discussion.

**Methods of synthesis**
Studies were grouped by the adverse effect targeted and the type of intervention and the data were combined in a narrative synthesis. The evidence on each intervention was graded using published methods (Newell 2002) to produce recommendations. Strong recommendations for or against the intervention applied when there were three or more relevant randomised controlled trials (including one of good quality) and at least 75 per cent reported a statistically significant difference between the groups at any time point for at least one review outcome. Tentative recommendations required consistent results from at least 75 per cent of relevant randomised controlled trials. Inconsistent evidence resulted in no recommendation.

**Results of the review**
Sixty randomised controlled trials were included in the review. The median sample size was 48 (range 7 to 700). Thirteen randomised controlled trials were good quality and 47 were fair quality. Allocation concealment and group equivalence were generally well reported. Lack of adequate blinding was a common weakness. Fifteen randomised controlled trials reported power calculations, but only 45 per cent reported means for both groups, 23 per cent reported standard deviations and five reported on effect sizes.

**Self care interventions versus controls:**

**Nausea and vomiting**
Tentative recommendations were made for the effectiveness of: cognitive distraction, for which two out of two (2/2) relevant randomised controlled trials reported statistically significant effects; exercise (2/2); hypnosis (3/4); music therapy (1/1); relaxation (10/13); and systematic desensitisation (2/2). A tentative recommendation was made against biofeedback (0/1). Evidence on acupressure (3/5) and psycho-education (1/2) was inconsistent.

**Constipation**
A tentative recommendation was made against exercise (0/1).

**Diarrhoea**
Evidence on exercise was inconsistent (1/2).

**Fatigue**
Tentative recommendations were made for the effectiveness of psycho-education (2/2) and relaxation (1/1). Evidence on exercise was inconsistent (2/5).

**Hair loss**
Tentative recommendations were made for the effectiveness of scalp cooling (3/4). A tentative recommendation was made against exercise (0/1).

**Mucositis**
Tentative recommendations were made for the effectiveness of hypnosis (1/1), oral cryotherapy (1/1) and vitamin E cream (1/1). A tentative recommendation was made against exercise (0/2) and psycho-education (0/1). Evidence on oral hygiene was inconsistent (10/20).

No strong recommendations could be made for any outcome.

**Authors’ conclusions**
Although some self-care strategies appeared promising for managing the adverse effects of chemotherapy, the quality of evidence was limited and further better-designed studies were required.

**CRD commentary**
The objectives and inclusion criteria of the review were clear. Relevant sources were searched for studies. The restriction to studies published in English meant that the review was prone to language and publication biases. Steps were taken to reduce the risk of reviewer bias and error by having more than one reviewer independently select studies.
and extract data, however, it was unclear whether this also applied to study selection. Suitable criteria were used to assess study validity and only the better quality evidence was included in the review. Details about the included studies were only provided for studies with statistically significant results and no information was provided about the quality of individual studies. This prevented the reader from examining differences between the studies (such as sample size) that might account for the different findings. No information was provided about control conditions in the included studies. The decision not to pool studies statically appeared valid due to the marked heterogeneity between the studies, but the vote-counting process used was of uncertain validity as it did not account for study power, effect sizes or measures of variance. Limitations of the primary studies, such as small sample sizes and poor reporting, were well addressed in the text. The authors appropriately avoided drawing definitive conclusions from their findings and the cautious conclusions appear justified.

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

Research: The authors stated that criteria should be developed for evaluating the effectiveness of self-care interventions. They suggested that strategies found helpful in their review should be further investigated, along with specific oral hygiene strategies for mucositis. Future randomised controlled trials should be well-designed and properly powered, and should report methods and findings in detail, including the psychometric properties of their outcomes measures.

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