What is the effectiveness of the use of polyunsaturated fatty acid omega-3 in the treatment of depression?

Rocha Araujo DM, Vilarim MM, Nardi AE

CRD summary
The authors concluded that use of omega-3 may be promising in the treatment of depression, but more research was needed for clarification. Due to limitations in the review process and substantial variability in the included studies, the authors’ conclusions should be treated with caution.

Authors’ objectives
To assess the effect of polyunsaturated fatty acid omega-3 (n-3) on depressive disorder.

Searching
PubMed, SciELO and Web of Science were searched. Search terms were reported. The search appeared to be between 1998 and 2008, although this was not stated explicitly.

Study selection
Original studies that evaluated the effect of polyunsaturated fatty acid omega-3 on depressive disorder in participants who were 18 years or older with no comorbidities were included in the review. Review articles were excluded.

In the included studies, mean age ranged from 30 to 75 years; one study included patients aged 80 to 96 years. In some studies, participants were excluded if they were taking antidepressant medication. A wide range of scales was used to measure depression. In several studies, only a proportion of the sample had diagnosed depression at baseline and severity varied. Dosage and quantities of n-3 varied between studies. Patients were given either combinations of eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA) and either vitamin E or olive oil or pure EPA or DHA. Means of evaluating intake of n-3 varied and included serum tests, food frequency questionnaires and samples of fat from buttock tissue. Where reported, placebo arms included orange oil, corn and soy oil mixture or liquid paraffin. Studies were undertaken in USA, Australia, Spain, Canada, UK, Holland, New Zealand, Greece, France and China.

The authors did not state how the papers were selected for the review.

Assessment of study quality
The authors described the drop-out rate of individual studies (where reported) and whether confounding factors were controlled for in the analysis.

The authors did not state how the quality assessment was undertaken.

Data extraction
The reviewers extracted the results from individual studies on the association between n-3 and depression according to how these were reported.

The reviewers do not state how data extraction was undertaken.

Methods of synthesis
The studies were synthesised in narrative format by counting the proportion of studies that reported a positive association between n-3 and depression. Individual studies used either p value, a correlation coefficient or the coefficient of determination to measure the relationship between n-3 and depression. Sources of heterogeneity between the studies were discussed.

Results of the review
Nineteen studies (47,062, range 24 to 13,017) were included in the review: four randomised controlled trials (RCTs), nine case control studies, two cross-sectional surveys and four described as using a cohort format. Eleven studies
provided information on dropouts; dropout rates varied from 3% to 86%. Twelve studies controlled for confounding factors in the analyses; age and sex were the most commonly identified confounding factors.

Thirteen of 19 studies reported a significant association between n-3 and depression; eight of these studies had controlled for confounding factors in their analyses. Most of these studies had large attrition; eight of 11 studies had dropouts greater than 30%.

Authors’ conclusions
Usage of omega-3 may be promising in the treatment of depression, but more research is needed for clarification.

CRD commentary
The review addressed a broad non-specific question. Inclusion criteria were broad and non-specific. Three electronic databases were searched with appropriate search terms. No attempts were made to find ongoing or unpublished studies, so publication bias could not be excluded. Methods used for selection of studies, quality assessment and data extraction were not reported, so reviewer bias and error could not be excluded. Although quality assessment was not reported explicitly, drop-out rates and control for confounding variables in the analyses were recorded. Drop-out rates in the included studies were mostly substantial, which reduced confidence in individual results. Study designs and scales used to measure depression varied. There was extensive variability in participant age, proportions of participants with depression at baseline, methods used to evaluate intake of n-3, quantity and type of n-3 administered and statistical parameters used to measure associations. The included studies appeared to be answering different questions: some assessed the association between levels of n-3 in the blood and depression and others attempted to assess the effectiveness of n-3 as a treatment for depression.

Due to major shortcomings in the review process and substantial variability in the included studies, the reviewers’ conclusions should be treated with caution.

Implications of the review for practice and research
Practice: The authors stated that the suggested consumption levels of linolenic acid (omega-3) were 1.6g/day for men and 1.1g/day for women.

Research: The authors stated that further research was needed to determine the therapeutic dosage of polyunsaturated fatty acid n-3 for treatment of depression.

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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.