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Systematic review of the nutritional supplements dimethyl sulfoxide (DMSO) and methylsulfonylmethane (MSM) in the treatment of osteoarthritis

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CRD summary

The authors of this review concluded that there was no definitive evidence to support use of dimethyl sulphoxide and methylsulphonylmethane in treatment of osteoarthritis. They recommended further research to clarify optimum dosage, efficacy and safety. Their conclusions and recommendations for research appear appropriate.

Authors' objectives

To evaluate the efficacy and safety of dimethyl sulphoxide (DMSO) and methylsulphonylmethane (MSM) in the treatment of osteoarthritis.

Searching

The Cochrane Library, MEDLINE, EMBASE, AMED, CINAHL and NELH Complementary and Alternative Medicine Specialist Library were searched between 1950 and November 2007. Citation tracking was used to locate unpublished trials. Search terms were reported.

Study selection

Randomised controlled trials (RCTs) or quasi-RCTs that compared DMSO or MSM to placebo or standard care in the treatment of osteoarthritis were eligible for the review. Validated outcome measures needed to be used for osteoarthritis. Studies that included patients with other joint pathology were excluded.

All studies evaluated osteoarthritis of the knee joint. Studies varied in DMSO or MSM treatment regimens. Treatment periods for DMSO were from three weeks up to a month. The treatment period for MSM was 12 weeks. Outcomes included pain (measured on a variety of scales), mobility, swelling, global assessment of efficacy and tolerability, amount of rescue medication taken, walking time, physical function and stiffness and adverse events.

The authors did not say how studies were selected for the review.

Assessment of study quality

The five-point Jadad scale of randomisation, blinding procedures and study withdrawals was used to assess study quality. Other measures of internal and external validity were recorded. Quality was assessed by the authors independently. Disagreements were resolved by discussion.

Data extraction

The authors did not state how data were extracted for the review.

Methods of synthesis

A narrative synthesis was conducted, grouped into trials of either DMSO or MSM.

Results of the review

Six studies were included (n=849). Studies scored between 2 and 5 on the Jadad scale. Two studies had robust randomisation, five made use of blinding and five documented procedures for withdrawals. A range of methodological problems were detected: suboptimal drug dosage and treatment duration; studies underpowered to detect treatment differences; and quality of reporting of adverse events.

Two studies of DMSO presented positive outcomes on measures of pain and two presented negative outcomes. The two studies on MSM reported significant effects over placebo. The number of adverse events in the DMSO studies was between 16% and 68%. The only study of MSM reported 57% adverse events. No serious adverse events were reported; most were minor symptoms, localised skin reactions and gastrointestinal symptoms.

Authors' conclusions

There was no definitive evidence for dimethyl sulphoxide (DMSO) and methylsulphonylmethane (MSM) in the treatment of osteoarthritis at the time of the review. Further research was recommended.

CRD commentary

This review had defined inclusion criteria for participants, interventions, outcomes and study designs. The authors searched a range of databases without publication and language restrictions. Quality was assessed and a range of methodological issues highlighted. the authors used procedures to protect against bias and error in quality assessment; it was unclear whether similar procedures were used for study selection and data extraction. A narrative synthesis appeared justified given the variation between studies. The authors' conclusions and recommendations for further research appear appropriate.

Implications of the review for practice and research

The authors did not state any implications for practice.

Research: The authors stated that further trials were required to identify the optimum dosage of MSM and DMSO and consider their long-term safety and efficacy as adjunctive or alternative treatments for osteoarthritis. There was a need to improve the design, analysis and reporting of future studies; these included adequate power to detect a treatment effect, use of an adequate treatment period, appropriate outcome measures and appropriate blinding. A trial that compared MSM and standard conventional treatment would be of value.

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CRD has determined that this article meets the DARE scientific quality criteria for a systematic review.

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