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# Magnesium for skeletal muscle cramps

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## Abstract

**Background:** Skeletal muscle cramps are common and often occur in association with pregnancy, advanced age, exercise or motor neuron disorders (such as amyotrophic lateral sclerosis). Typically, such cramps have no obvious underlying pathology, and so are termed idiopathic. Magnesium supplements are marketed for the prophylaxis of cramps but the efficacy of magnesium for this purpose remains unclear. This is an update of a Cochrane Review first published in 2012, and performed to identify and incorporate more recent studies.

**Objectives:** To assess the effects of magnesium supplementation compared to no treatment, placebo control or other cramp therapies in people with skeletal muscle cramps. SEARCH METHODS: On 9 September 2019, we searched the Cochrane Neuromuscular Specialised Register, CENTRAL, MEDLINE, Embase, LILACS, CINAHL Plus, AMED, and SPORTDiscus. We also searched WHO-ICTRP and ClinicalTrials.gov for registered trials that might be ongoing or unpublished, and ISI Web of Science for studies citing the studies included in this review.

**Selection criteria:** Randomized controlled trials (RCTs) of magnesium supplementation (in any

magnesium as a series of slow intravenous infusions. Nine trials compared magnesium to placebo, one trial compared magnesium to no treatment, calcium carbonate or vitamin B, and another trial compared magnesium to vitamin E or calcium. We judged the single trial in people with liver cirrhosis and all five trials in participants with pregnancy-associated leg cramps to be at high risk of bias. In contrast, we rated the risk of bias high in only one of five trials in participants with idiopathic rest cramps. For idiopathic cramps, largely in older adults (mean age 61.6 to 69.3 years) presumed to have nocturnal leg cramps (the commonest presentation), differences in measures of cramp frequency when comparing magnesium to placebo were small, not statistically significant, and showed minimal heterogeneity ($I^2$ = 0% to 12%). This includes the primary endpoint, percentage change from baseline in the number of cramps per week at four weeks (mean difference (MD) -9.59%, 95% confidence interval (CI) -23.14% to 3.97%; 3 studies, 177 participants; moderate-certainty evidence); and the difference in the number of cramps per week at four weeks (MD -0.18 cramps/week, 95% CI -0.84 to 0.49; 5 studies, 307 participants; moderate-certainty evidence). The percentage of individuals experiencing a 25% or better reduction in cramp rate from baseline was also no different (RR 1.04, 95% CI 0.84 to 1.29; 3 studies, 177 participants; high-certainty evidence). Similarly, no statistically significant difference was found at four weeks in measures of cramp intensity or cramp duration. This includes the number of participants rating their cramps as moderate or severe at four weeks (RR 1.33, 95% CI 0.81 to 2.21; 2 studies, 91 participants; moderate-certainty evidence); and the percentage of participants with the majority of cramp durations of one minute or more at four weeks (RR 1.83, 95% CI 0.74 to 4.53, 1 study, 46 participants; low-certainty evidence). We were unable to perform meta-analysis for trials of pregnancy-associated leg cramps. The single study comparing magnesium to no treatment failed to find statistically significant benefit on a three-point ordinal scale of overall treatment efficacy. Of the three trials comparing magnesium to placebo, one found no benefit on frequency or intensity measures, another found benefit for both, and a third reported inconsistent results for frequency that could not be reconciled. The single study in people with liver cirrhosis was small and had limited reporting of cramps, but found no difference in terms of cramp frequency or cramp intensity. Our analysis of adverse events pooled all studies, regardless of the setting in which cramps occurred. Major adverse events (occurring in 2 out of 72 magnesium recipients and 3 out of 68 placebo recipients), and withdrawals due to adverse events, were not significantly different from placebo. However, in the four studies for which it could be determined, more participants experienced minor adverse events in the magnesium group than in the placebo group (RR 1.51, 95% CI 0.98 to 2.33; 4 studies, 254 participants; low-certainty evidence). Overall, oral magnesium was associated with mostly gastrointestinal adverse events (e.g. diarrhoea), experienced by 11% (10% in control) to 37% (14% in control) of participants.

**Authors' conclusions:** It is unlikely that magnesium supplementation provides clinically meaningful cramp prophylaxis to older adults experiencing skeletal muscle cramps. In contrast, for those experiencing pregnancy-associated rest cramps the literature is conflicting and further research in this population is needed. We found no RCTs evaluating magnesium for exercise-associated muscle cramps or disease-state-associated muscle cramps (for example amyotrophic lateral sclerosis/motor neuron disease) other than a single small (inconclusive) study in people with liver cirrhosis, only some of whom suffered cramps.

What is the role of magnesium for skeletal muscle cramps? A Cochrane Review summary with commentary.

Moretti A.

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