FPIN's Clinical Inquiries

Does Magnesium Supplementation Treat Nocturnal Leg Cramps?

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Clinical Question

Is magnesium supplementation an effective treatment for nocturnal leg cramps?

Evidence-Based Answer

Probably not. Magnesium supplementation should not be used for short courses (less than 60 days) to treat idiopathic or pregnancy-related nocturnal leg cramps. (Strength of Recommendation [SOR]: B, systematic reviews of randomized controlled trials [RCTs], highly heterogeneous studies.) There is limited evidence that magnesium oxide may improve nocturnal leg cramps after 60 days of treatment. (SOR: B, single RCT.)

Evidence Summary

A 2020 systematic review of 11 RCTs (open-label, single-blind, or double-blind with nine parallel groups and two crossover studies; n = 735) evaluated the effectiveness of magnesium supplementation in patients of any age to prevent skeletal muscle cramps associated with pregnancy, cirrhosis, or unknown etiology.[1] The review found no reduction in leg cramps. Five trials enrolled women with pregnancy-associated leg cramps (n = 408), five trials enrolled participants with idiopathic cramps (n = 271), and one trial enrolled 29 participants with cirrhosis who reported having cramps. Most trials provided magnesium as an oral supplement in different dosing frequencies: once (three trials), twice (five trials), or three times (two trials) daily. One study provided magnesium as a five-day series of four-hour slow intravenous infusions. Nine trials compared magnesium with placebo; one trial compared magnesium with no treatment, calcium carbonate, or vitamin B; and one trial compared magnesium with vitamin E or calcium.

For idiopathic leg cramps, the mean percentage change from baseline in the number of cramps per week at four weeks was not notable between magnesium and placebo (three studies; n = 177; mean difference [MD] = −9.59%; 95% CI, −23.14% to 3.97%; moderate-certainty evidence).[1] There was no difference in the number of leg cramps per week at four weeks (five studies; n = 307; MD = −0.18 cramps per week; 95% CI, −0.84 to 0.49; moderate-certainty evidence). No significant differences were found between treatment and placebo for any secondary outcomes. These included at least a 25% reduction in the rate of leg cramps from baseline (three studies; n = 177; risk ratio [RR] = 1.04; 95% CI, 0.84 to 1.29; high-certainty evidence), the number of participants rating their leg cramps as moderate to severe at four weeks (two studies; n = 91; RR = 1.33; 95% CI, 0.81 to 2.21; moderate-certainty evidence), the percentage reduction in leg cramps at 12 weeks (one study; MD = −12.09%; 95% CI, −40.22% to 16.04%; n = 43), and achieving at least a 25% reduction in the frequency of leg cramps at 12 weeks (one study; n = 43; RR = 1.22; 95% CI, 0.70 to 2.1).

In patients with pregnancy-associated leg cramps (mean age = 29.3 years), the data had high

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This series is coordinated by John E. Delzell Jr., MD, MSPH, associate medical editor.

A collection of FPIN's Clinical Inquiries published in *AFP* is available at https://www.aafp.org/afp/fpin.

Author disclosure: No relevant financial relationships.

heterogeneity (only one participant used a cramp diary), which prevented pooling of the data.[1] All five trials were judged to be at high risk of bias. One study comparing magnesium with no treatment found no benefit on overall effectiveness. Of the three trials comparing magnesium to placebo, one found no benefit for frequency or intensity, another found benefit for both, and the last trial reported inconsistent and irreconcilable results for frequency. No statistically significant differences were noted in minor adverse effects between the treatment and placebo groups (four studies; n = 254; RR = 1.51; 95% CI, 0.98 to 2.33; low-certainty evidence). Oral magnesium supplementation was associated with mostly gastrointestinal adverse effects (e.g., diarrhea), experienced by 11% to 37% of the magnesium group compared with 10% to 14% of the control group.

A 2021 meta-analysis of four RCTs, three of which were included in the above review, examined the effectiveness of magnesium in preventing leg cramps in pregnant patients (n = 332).[2] When magnesium supplementation was compared with placebo, there was no difference in the weighted MD of leg cramps (–4.7; 95% CI, –1.14 to 2.0). Two women in each group had gastrointestinal adverse effects of nausea and diarrhea. The pooled analysis found no difference in recovery from or change in frequency of leg cramps.

A 2021 prospective, multicenter, randomized, double-blind, placebo-controlled trial (n = 184) assessed the effectiveness of a 226-mg magnesium oxide monohydrate supplement taken once daily vs. placebo in outpatients and inpatients in the Ukraine.[3] Patients were 45 years and older, did not have diagnosed neurologic disorders of the lower extremities, and reported at least four nocturnal leg cramp episodes during the screening period. There was a two-week screening period in which patients were monitored for nocturnal leg cramps, followed by a 60-day treatment period comparing the magnesium supplement with placebo. Patients were assessed at screening, day 1, day 30, and day 60. The number of nocturnal leg cramps was monitored via patient diaries, including the severity of pain (0 to 10 on a visual analog scale), duration of episodes, quality of sleep (0 to 5 on a visual analog scale), and quality of life (36-item short-form health survey). At 30 days, there was no significant difference in reduction of cramp frequency (5.4 cramps per week at baseline vs. 3.2 cramps per week with treatment compared with 6.4 at baseline vs. 3.6 with placebo at 30 days; $P = .099$) or cramp episode duration (244.5 seconds at baseline vs. 99.9 seconds at 30 days of treatment compared with 266.5 seconds at baseline vs. 137.4 seconds with placebo; $P = .057$). After 60 days of treatment, there was a significant difference in cramp frequency reduction (5.4 cramps per week at baseline vs. 1.9 cramps per week with treatment compared with 6.4 at baseline vs. 3.7 with placebo; $P = .005$) and cramp episode duration (244.5 seconds per week at baseline vs. 67.9 seconds per week in the treatment group at 60 days compared with 266.5 at baseline vs. 127.2 seconds per week in the placebo group; $P = .004$).

There was no difference between groups in the visual analog scale pain reduction scores at day 30 or 60. There was a significant difference in sleep quality at day 30 (13.1 at baseline vs. 7.2 with treatment compared with 12.5 at baseline vs. 8.0 with placebo; $P = .049$) and day 60 (13.0 at baseline vs. 5.0 with treatment compared with 12.5 at baseline vs. 7.1 with placebo; $P < .001$). Four patients in the placebo group reported minor adverse effects (e.g., fatigue, headache, nausea, diarrhea, muscle twitching), whereas no adverse effects were reported in the treatment group.

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