



➤ Product Review ➤

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MANAGING NOCTURNAL LEG CRAMPS: AN INNOVATIVE USE OF VITAMIN K2

INTRODUCTION

Who among us, at one time or another during our lives, has not experienced night-time (nocturnal leg cramps) (NLCs)? Fortunately, for many, if not most of us, NLCs are a minor inconvenience that occur rarely with moderate intensity for a relatively short duration. However, for all too many, NLCs can occur all too often with sufficient intensity and duration to cause a major disruption in quality of sleep and life. Contrary to what the authors state in the paper I am about to review, several reliable anecdotal reports over the years strongly suggest that magnesium supplementation is a reliable intervention that acts fairly quickly. The magnesium product from Moss Nutrition that has generated the most positive reports concerning NLCs is **Magnesium Select®**, which is a product composed of magnesium glycinate and magnesium malate. However, despite the many positive reports we have received over the years concerning the use of **Magnesium Select®** for NLCs, I can certainly state with great certainty that **Magnesium Select®** is far from a panacea in this regard.

Therefore, I was glad to encounter the recently published study that suggested another intervention for NLCs that, quite frankly, I never would have suspected – vitamin K2. Interestingly, vitamin K2 supplements do not attract much attention in clinical

nutrition/functional medicine circles mainly because its benefit is thought to be limited to its role as an adjunct to the impact of vitamin D on human physiology. In contrast to this conventional thinking, Tan et al in their paper “Vitamin K₂ in managing nocturnal leg cramps: A randomized clinical trial” (Tan J et al. *JAMA Internal Medicine*, published online October 28, 2024) present compelling clinical research that vitamin K₂ will be just as reliable, if not more so, than magnesium. The vitamin K₂ product provided by Moss Nutrition is **MK-7 Select®**, which provides vitamin K₂ as menaquinone-7 (MK-7), the same form of vitamin K₂ that was used in the Tan et al study. Furthermore, the amount of menquinone-7 in each capsule of **MK-7 Select®** is 160 mcg, just 11% short of the 180 mcg daily dose used in the Tan et al study. Below is my review of the Tan et al study.

TREATMENT OF NLCs USING MK-7

The first quote I would like to feature from the Tan et al paper discusses NLC frequency. As I mentioned they are quite common in adult populations:

“Approximately 50% to 60% of adults experience nocturnal leg cramps (NLCs) in their lifetime.”

The next quote notes the lack of efficacy of traditional treatments, including magnesium. As I mentioned, anecdotal reports suggest that the assertion by Tan et al about the efficacy of magnesium may not be entirely correct:

“...there is limited evidence supporting the use of specific medications (such as magnesium and calcium channel blockers) for managing NLCs.”

The structure of the study is as follows:

“This multicenter, double-blind, placebo-controlled randomized clinical trial enrolled older individuals 65 years and older with 2 or more documented episodes of NLCs during 2 weeks of screening. Participants were randomized to receive vitamin K₂ (menaquinone 7 [MK-7]), 180 µg, or a similar-looking placebo capsule every day for 8 weeks in a 1:1 ratio. The primary outcome was the mean number of NLCs per week in the vitamin K₂ and placebo arms. Secondary outcomes included the duration of muscle cramps measured in minutes and the severity of muscle cramps assessed using an analog scale ranging from 1 to 10.”

The logistics of the study are as follows:

“Of the 199 enrolled individuals, 108 (54.3%) were female, and the mean (SD 5.5) age was 72.3 years. A total of 103 patients (51.8%) were randomly assigned to receive vitamin K₂ and 96 (48.2%) were assigned to placebo. Treatment compliance was 86.5% (83 of 96) in the placebo group and 92.2% (95 of 103) in the vitamin K₂ group.”

The next quote features the results of the study:

“At baseline, the mean (SD) number of NLCs was comparable in both the vitamin K₂ group...and the placebo group. Over the 8-week intervention period, the vitamin K₂ group demonstrated a marked reduction in cramp frequency, reaching a mean (SD) of 0.96...In contrast, the placebo group exhibited a persistent mean (SD) cramp frequency of 3.63. The difference in cramp frequency at intervention phase between the vitamin K₂ and placebo groups was statistically significant...”

In addition:

“The duration and pain intensity decreased during the intervention phase for the vitamin K₂ and placebo groups. The vitamin K₂ group showed a greater mean (SD) reduction in NLC severity...compared with the placebo group...”

With the above in mind, Tan et al noted:

“Our results demonstrated that daily vitamin K₂ supplementation alleviates muscle cramps in older individuals affected by NLCs, manifested

by decreased frequency, shortened duration, and weakened intensity. Notably, cramping frequency was significantly reduced compared with the placebo group, starting from the first week of intervention with vitamin K₂.”

What is the mechanism for the profound effect on NLCs? While research addressing this question is limited, the authors suggest:

“Despite extensive research on the mechanisms by which vitamin K contributes to bone and cardiovascular health the understanding of how vitamin K affects muscle remains significantly limited. Previous clinical studies have shown that vitamin K acupuncture point injection can alleviate the pain of menstrual cramps in patients with primary dysmenorrhea. An in vitro study provided a possible mechanism of the anticontraction effect of vitamin K. Vitamin K causes myometrial relaxation by inhibiting calcium intake from the external medium, an action mediated by blocking the voltage-dependent calcium channels and thus attenuating intracellular calcium levels in muscle cells.”

As most of you know, the reason vitamin K is often combined with vitamin D is to temper the tendency of vitamin D to channel calcium into tissues non-selectively whether the tissues be hard tissue (bone) or soft tissues such as arteries. How does vitamin K temper this non-selective impact of vitamin D? As we also all know, vitamin K, and specifically vitamin K₂, which is the form of vitamin K used in the Tan et al paper just reviewed, will tend to preferentially direct, so to speak, calcium to bony structures where most calcium rightly belongs. Therefore, it makes sense that, if vitamin K₂ can help prevent arterial calcification, it could very well reduce intracellular transport of calcium into muscles. Hence, the mechanism proposed by Tan et al as to why vitamin K₂ supplementation reduces NLCs is certainly consistent with what has been long known about the metabolic impact of vitamin K supplementation. Therefore, for your patients experiencing NLCs, consider **MK-7 Select®**.