Vitamin K2 (MK-7) is Good for More Than Just Arteries & Bone

The menaquinone-7 (MK-7) form of vitamin K2 is well-known for its benefits for arterial stiffness and bone density. In fact, I've personally published two peer-reviewed articles[1] [2] discussing these effects. Less known are the benefits of MK-7 for muscle cramps, polycystic ovary syndrome, rheumatoid arthritis, and glucose/insulin modulation. That's what I'm going to review in this article.

MK-7 for arterial stiffness and bone density

Before I discuss these lesser-known benefits, I feel compelled to first briefly review the research on MK-7 for arterial stiffness and bone density. Here's the nickel version. Vitamin K-dependent proteins help keep calcium in the bones. Not only is that good for the bones, but it's also good for the arteries since we don't want calcium hanging out making those arteries stiffer. [3] [4] [5] [6] [7] [8] [9] As it turns out, double-blind, placebo-controlled research[10] has demonstrated that supplementation with 180 mcg/day MK-7 improves arterial stiffness in healthy postmenopausal women. In addition, MK-7 supplementation also helped lower arterial stiffness in hemodialysis patients—although a higher dose of 360-375 mcg/day was used (and even as high as 1080 mcg/day).[11] [12]

Similarly, supplementation with 180 mcg/day MK-7 decreased the age-related decline in bone mineral content and bone mineral density at the lumbar spine and femoral neck, improved bone strength and significantly decreased the loss in vertebral height in healthy postmenopausal women.[13] As low as 90 mcg/day of MK-7 was also shown to reduce bone loss in middle-aged and elderly women.[14] Also, postmenopausal women with osteopenia also demonstrated a preservation of bone structure with 375 mcg/day MK-7.[15]

Muscle cramps

Since muscle cramps occur in 33% to 78% of patients with dialysis, multicenter, randomized, placebo-controlled clinical trial[16] investigated the effect of 360 mcg/day MK-7 or placebo in reducing the frequency and severity of muscle cramps in 39 hemodialysis (HD) patients. Each participant received vitamin K2 (360 μg/d) or placebo (in a crossover design). Results were that MK-7 reduced the frequency, duration, and severity of muscle cramps in HD patients (all $P < 0.05$). There were no serious adverse events. In conclusion, this trial demonstrated that vitamin MK-7 supplementation was effective in decreasing the frequency, duration, and severity of muscle cramps in HD patients.

Polycystic ovary syndrome

An 8-week, randomized, double-blind, placebo-controlled clinical trial[17] investigated the effect of 90 mcg/day MK-7 or placebo on clinical and biochemical parameters in 84 polycystic ovary syndrome (PCOS) patients. Results were that, compared to placebo, MK-7 significantly decreased serum fasting insulin ($p = 0.002$) and insulin resistance ($p = 0.002$) in addition to a significant increase in quantitative insulin sensitivity check index ($p = 0.001$). Also, MK-7 administration led to significant declines in serum triglyceride ($p = 0.003$) and dihydrotestosterone (DHT; $p = 0.03$) levels, free androgen index ($p < 0.001$), waist circumference ($p = 0.03$), and body fat mass ($p < .001$) as well as significant increases in skeletal muscle ($p < 0.001$) and sex hormone binding globulin (SHBG, $p < 0.001$). In conclusion, this study highlights the beneficial effects of MK-7 on insulin resistance, fat mass, skeletal muscle, and serum levels of triglyceride, DHT, and SHBG in PCOS patients.

Since PCOS patients are subject to depression, and since PCOS can be managed by improving insulin sensitivity, a second 8-week randomized, double blind, placebo-controlled clinical trial[18] was conducted to assess the effect of 90 mcg/day MK-7 or placebo on depression status in 84 women with PCOS. Results were that consumption of MK-7, in comparison with the placebo capsules, significantly improved depression status (P = 0.012, as measured by BECK depression inventory-II). In conclusion, this clinical study reported the advantageous effect of MK-7 administration on depression status in PCOS patients.

Rheumatoid arthritis

This randomized, cross-sectional, clinical study[19] was designed to assess the therapeutic role of 100 mcg/day MK-7 added to normal therapeutic regimen of 84 rheumatoid arthritis (RA) patients with various stages of disease. The patients were divided into MK-7 treated group (n=42) and control group (n=42). Results were a significant decrease for the levels of erythrocyte sedimentation rate (which are increased in RA), disease activity score assessing 28 joints, C-reactive protein (CRP, an inflammation marker) and matrix metalloproteinase (a tissue damage marker) in the MK-7 treated group. The MK-7 treated group also experienced a marked decrease in RA clinical and biochemical markers. The results suggest that MK-7 reduced disease activity by 41% in RA patients.

Glucose/insulin modulation

This 12-week, double-blinded, placebo-controlled, randomized trial[20] investigated the effects of 360 mcg/day or placebo on glucose, insulin, and lipid metabolism in patients with 68 type 2 diabetes mellitus (T2DM). At the end of the trial, fasting plasma glucose (FPG, p = 0.031) and glycated hemoglobin (HbA1c, p = 0.004) were significantly lower in the MK-7 group compared with the placebo. The number of participants who achieved the target levels of glycemic control based on FPG, and HbA1c concentrations were significantly higher in the vitamin K2 group compared to the placebo group. The study concluded that daily intake of 360 mcg/day MK-7 for 12-weeks reduces FPG and HbA1c in patients with T2DM.

Conclusion

In addition to MK-7's well-known for its benefits for arterial stiffness and bone density, additional research has shown that MK-7 also has benefits for muscle cramps, polycystic ovary syndrome, rheumatoid arthritis, and glucose/insulin modulation.

Note: The information presented in this article is for educational purposes only. It does not constitute recommendations for structure/function claims.

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