REVIEW

Diet and psoriasis, part III: Role of nutritional supplements

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Patients with psoriasis are increasingly turning to the use of alternative and complementary medicine to manage their psoriasis. Patients often inquire about what dietary supplements may be beneficial, including the use of oral vitamin D, vitamin B12, selenium, and omega-3 fatty acids in fish oils. In this review we examine the extent to which each of these common nutritional interventions has been studied for the treatment of psoriasis. We weighed evidence from both controlled and uncontrolled prospective trials. The evidence of benefit was highest for fish oils. For other supplements, there is need for additional large, randomized clinical trials to establish evidence of efficacy. (J Am Acad Dermatol http://dx.doi.org/10.1016/j.jaad.2014.03.016.)

Key words: diet; fish oil; nutrition; omega-3; oral vitamin D; psoriasis; selenium; vitamin B12; 1,25-dihydroxycholecalciferol; 1,25-dihydroxyvitamin D3; 1,25-$(OH)_2D_3$.

The use of alternative and complementary medicine has soared in popularity with patients, not just for improvement of baseline health, but even in the management of chronic conditions such as psoriasis.[1,2] There is a growing body of popular and scientific literature for the use of nutritional supplementation in the treatment of psoriasis. With this information readily available, patients often perform independent research and ask their dermatologists about what they can add to their diets to make their condition more manageable. Here we sought to explore some of the most common nutritional supplements and explore to what extent the scientific literature has evaluated their respective clinical efficacies. We review studies that have examined oral vitamin D, vitamin B12, selenium, and omega-3 fatty acids.

Abbreviations used:

DHA: docosahexaenoic acid
EPA: eicosapentaenoic acid
PASI: Psoriasis Area Severity Index
UV: ultraviolet

METHODS

We performed our literature search in June 2013 using the electronic MEDLINE database via PubMed. Search terms included "psoriasis" combined with "oral vitamin D," "1,25-$(OH)_2D_3$," "1,25-dihydroxy vitamin D3," "1,25-dihydroxycholecalciferol," "fish oil," "omega," "B12," "vitamin B," and "selenium," respectively. In addition, abstracts containing the key words "alternative therapies" and "nonstandard treatment" were reviewed. We limited our search to articles available in English and those published between 1960 and 2013. Manual searches of bibliographies of the articles were also performed to identify additional studies to be included. Exclusion criteria included topical regimens and studies that did not specify supplement dosage. The primary outcome evaluated was a statistically significant reduction in Psoriasis Area and Severity

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Index (PASI) score and secondary outcomes were other reported clinical measures of improvement.

RESULTS

Fish oil

Oils of cold water fish rich in the omega-3 polyunsaturated fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been considered for use in psoriasis treatment. We found a total of 15 trials evaluating fish oil for the treatment of psoriasis (Table I). Although the populations studied and the outcomes assessed were heterogeneous, overall there was moderate evidence of benefit for the use of fish oil supplements in psoriasis, with 12 trials (6 controlled, 6 uncontrolled) showing clinical benefit in psoriasis and 3 trials (2 controlled, 1 uncontrolled) showing no benefit.

CAPSULE SUMMARY

- Despite high patient interest, synthesized evidence-based information regarding the role of nutritional supplementation in psoriasis is lacking.
- We reviewed prospective, interventional studies that have assessed the efficacy of nutritional supplements in psoriasis.
- There is evidence that omega-3 fatty acids may be beneficial in psoriasis. However, additional studies are necessary to determine the roles of oral vitamin D, B12, and selenium.

Mayser et al[3] and Grimminger et al[4] each conducted double-blind, randomized, controlled studies comparing the effect of intravenous omega-3 fatty acids (Omegaven, Fresenius, Bad Homburg, Germany) to omega-6 fatty acids (Lipoven, Fresenius) for the treatment of psoriasis. In the Mayser et al[3] study, 75 subjects with chronic plaque psoriasis were randomized to a 14-day treatment with either intravenous omega-3 or omega-6. PASI scores decreased by 11.2 ± 9.8 in the omega-3 group versus 7.5 ± 8.8 in the omega-6 group (P = .048), with significantly better improvement for the omega-3 group in erythema, scale, and induration. In Grimminger et al,[4] 20 subjects with acute guttate psoriasis received either intravenous omega-3 or omega-6 for 10 days. The omega-3 group demonstrated greater improvement in erythema, scale, and induration compared with the omega-6 group ($P < .05$ for all categories). This corresponded to a greater than 10-fold increase in favorable neutrophil leukotriene products seen in the omega-3 group but not in the omega-6 group.

In another double-blind placebo-controlled trial of 24 patients with chronic stable plaque psoriasis, the group that received 10 capsules of MaxEPA (1.8 g EPA, 1.2 g DHA) (Seven Seas Health Care, Hull, UK) daily for 12 weeks showed more improvement in itching, erythema, scaling, and affected body surface area than the control group receiving 10 capsules of olive oil a day; however, only the improvement in erythema was statistically significant at 12 weeks.[5] Several uncontrolled, open studies have also shown that supplementation of fish oil, ranging from 0.54 to 13.5 g EPA and 0 to 9.0 g DHA daily for 6 weeks to 6 months, resulted in clinical improvement, measured by erythema, induration, and scaling.[6-12] These studies have also demonstrated clinical improvement associated with inhibition of leukotriene B4 production in peripheral leukocytes in vitro, decreases in platelet malondialdehyde production, changes in abnormalities of erythrocyte lipid membrane pattern, and increase in leukotriene B5 to leukotriene B4 ratio in peripheral blood neutrophils.[6-9,13]

Fish oil has also been studied in combination with other therapies. A double-blind, placebo-controlled study of 18 patients with severe stable plaque psoriasis demonstrated a statistically significant improvement of psoriasis on a regimen of fish oil with ultraviolet (UV) B therapy versus placebo olive oil with UVB.[14] An open investigation of 30 patients with mild to moderate plaque psoriasis who were given either tacalcitol, a synthetic vitamin D3 analog, or combined tacalcitol and Oravex (2.8 g EPA, 0.4 mg DHA) (Thea Laboratories, Barcelona, Spain), showed highly significant improvement ($P <$ .0001) in the PASI score in the Oravex group compared with control after 8 weeks.[15] Another study of 40 patients with chronic stable plaque psoriasis reported better clinical improvement of psoriasis with fish oil in combination with oral etretinate compared with etretinate monotherapy.[16]

There have also been several trials that have not shown significant improvement in psoriasis with fish oil (Table I). These studies used 1.8 to 3.2 g daily EPA and 1.2 to 2.2 g daily DHA.[11,17,18] In 1 randomized, double-blinded, controlled trial of 27 patients with psoriasis, there was no significant clinical difference between experimental fish oil group, which received 1.8 g EPA and 1.2 g DHA daily for 8 weeks, and the control olive oil group.[17] Another randomized, double-blinded, controlled study of 145 patients with moderate to severe psoriasis showed no significant difference in PASI score or patient-reported subjective score between the group receiving fish oil and the placebo group receiving corn oil.[18] A third open study that included 21 patients with plaque psoriasis also showed no clinically significant