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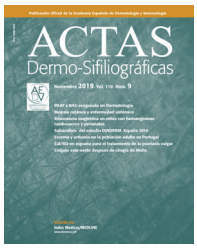

RESIDENTS FORUM

[Translated article] RF – Role of the Mediterranean Diet in the Treatment of Psoriasis

FR – El papel de la dieta mediterránea en el tratamiento de la psoriasis

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Psoriasis is a chronic inflammatory disease that is affected by multiple lifestyle-associated factors. In recent years, several studies have demonstrated the ability of certain foods and dietary patterns to modulate different markers related to systemic inflammation,[1] which is an important component of moderate-to-severe psoriasis and is closely linked to associated comorbidities. In a meta-analysis of clinical trials, weight loss through diet was associated with a significant decrease in disease severity.[2] Although these improvements could be attributed to a reduction in obesity-associated systemic inflammation, the results of the included studies showed great heterogeneity, suggesting a role of factors other than weight loss in the observed benefit. Diet composition, as mentioned above, could be one such factor.[1,2] The Mediterranean diet (MD) is a great source of antioxidant and anti-inflammatory molecules, and has been associated with a decreased risk of cardiovascular and chronic inflammatory diseases.[1] Accordingly, several research groups have investigated the potential benefits of MD in patients with psoriasis.

In a cross-sectional study published in 2015 by Barrea et al.,[3] poor MD adherence was observed in a significantly higher percentage of psoriasis patients than controls (30.6 and 4.8%, respectively; $P < 0.001$). Diet adherence was negatively correlated with disease severity as measured by the psoriasis area severity index (PASI). In the multiple regression analysis, consumption of olive oil was one of the main predictors of PASI score, with a correlation coefficient (r^2) of 0.548 ($P < 0.001$). The largest study in this field is a cross-sectional study published in 2018 in JAMA Dermatology[4] that included 35 735 subjects from the NutriNet-Santé cohort. Of the participating subjects, 3557 had psoriasis, which was classified as severe in 878 patients. In the multivariate analysis, after adjusting for variables such as age, sex, weight,

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Table 1 Studies Evaluating the Effect of the Mediterranean Diet in Psoriasis and/or Psoriatic Arthritis.

Author, year	Country	Study design	Population	Main findings
Barrea et al., 2015[3]	Italy	Observational, transversal. Adherence evaluated with the PREDIMED questionnaire: <6, low adherence; 6–9, moderate adherence; >9, high adherence.	62 psoriasis patients without previous systemic treatment. 62 age-, sex-, and BMI-matched controls.	Low adherence observed in significantly higher percentage of psoriasis patients than controls (30.6% vs. 4.8%; $P < 0.001$). Negative correlation between PREDIMED and PASI scores ($r = -0.576$; $P < 0.01$). Among PREDIMED items, use of EVOO was an independent predictive factor of PASI ($r^2 = 0.548$; $\beta = -0.741$; $t = -7.636$; $P < 0.001$). Fish consumption was an independent predictive factor of CRP ($r^2 = 0.139$; $\beta = -0.372$; $t = 2.922$; $P = 0.005$).
Phan et al., 2018[4]	France	Observational, transversal. Adherence evaluated with MEDI-LITE questionnaire (score of 0–18 [complete adherence]); tertiles 1 (0–7), 2 (8–9), and 3 (>10).	35 735 subjects from the NutriNet-Santé cohort. 3557 patients with psoriasis. 878 patients (24.7%) with severe psoriasis.	Univariate analysis: percentage of patients with severe psoriasis was higher in tertile 1 (severe psoriasis, 45.5%; non-severe psoriasis, 36.6%; no psoriasis, 35.6%; $P < 0.001$). Multivariate analysis*: • Tertile 2, OR (95% CI) for severe psoriasis: 0.74 (0.61–0.90). • Tertile 3, OR (95%CI) for severe psoriasis: 0.74 (0.60–0.91).
Molina-Leyva et al., 2019[8]	Spain	Observational, transversal. Adherence evaluated with PREDIMED questionnaire.	89 patients with psoriasis receiving systemic treatment.	PASI was lower in patients with greater MD adherence. Low adherence, 7 (95% CI 3.6–8.20); moderate adherence, 3.4 (95% CI 1.05–9.45); high adherence, 0.8 (95% CI 0.00–2.57); $P = 0.007$. Lower CRP in group with greatest MD adherence (3.20 ± 2.73 vs. 2.54 ± 3.84 vs. 1.12 ± 1.23; $P = 0.05$).
Korovesi et al., 2019[7]	Greece	Observational, transversal. Adherence evaluated with MedDietScore. $\leq$21, low adherence; 21–35, moderate adherence; $\geq$35, high adherence.	69 patients with psoriasis without prior systemic treatment. 69 controls matched by age, sex, BMI, and date of inclusion.	MD adherence inversely associated with risk of developing psoriasis[a] (OR, 0.34; 95% CI 0.13–0.92; $P = 0.03$). MedDietScore negatively correlated with PASI ($r = -0.39$, $P = 0.001$). PASI inversely associated with consumption of legumes, fish, and EVOO ($P < 0.05$).

Table 1 (*Continued*)

Author, year	Country	Study design	Population	Main findings
Castaldo et al., 2020[5]	Italy	Open clinical trial, single-arm. Intervention: ketogenic diet for first 4 weeks, followed by 6 weeks of hypocaloric MD.	37 patients with stable plaque psoriasis and overweight, without previous systemic drug treatment.	Mean PASI change of −10.6 (95% CI −12.8 to −8.4; $P < 0.001$). PASI50 in 97.3% and PASI75 in 64.9%. Mean weight reduction of −9.5% (95% CI −10.5 to −8.4; $P < 0.001$) and 12.0% (95% CI −13.7 to −10.4; $P < 0.001$) at end of the ketogenic period and the Mediterranean diet period, respectively. Mean DLQI change, −13.4 (95% CI −17.0 to −9.7; $P < 0.001$).
Case et al., 2020[6]	Italy	Observational, cross-sectional, multicenter. Adherence evaluated with PREDIMED questionnaire.	211 patients with psoriatic arthritis.	Inverse relationship between DAPSA and PREDIMED score ($\beta = -3.291$; 95% CI −5.884 to −0.698; $P = 0.013$)[**].

Abbreviations: DAPSA, Disease Activity in Psoriasis Arthritis; DLQI, Dermatology Life Quality Index; MD, Mediterranean diet; CI, confidence interval; BMI, body mass index; PASI, Psoriasis Area and Severity Index; PASI50, 50% reduction in baseline PASI; PASI75, 75% reduction in baseline PASI; CRP, C-reactive protein; PREDIMED, prevention with the Mediterranean diet; EVOO, extra-virgin olive oil.

[*] Adjusted for age, sex, BMI, smoking, physical activity, educational level, baseline history of cardiovascular disease, diabetes, hypertension, and hypertriglyceridemia.

[**] Adjusted for sex, BMI, and previous treatment with disease-modifying drugs.

[a] Adjusted for age, sex, and BMI.

and cardiovascular risk factors, the percentage of patients with severe forms of the disease was significantly lower among the groups with the greatest adherence to the diet. Castaldo et al.[5] evaluated the effect of a very low-calorie ketogenic diet for 4 weeks followed by hypocaloric MD for 6 weeks in a group of overweight/obese patients with psoriasis without systemic treatment. The authors observed significant reductions in weight and improvements in PASI and quality of life. Interestingly, they observed no linear correlation between weight loss and PASI, suggesting that the anti-inflammatory effect of ketone bodies and other dietary components contributed to the observed benefits. Finally, a recent study reported an inverse and weight-independent correlation between psoriatic arthritis activity and MD adherence, suggesting a potential benefit of this dietary pattern in these patients.[6] Table 1 summarizes published studies evaluating the effect of MD in psoriasis and/or psoriatic arthritis.

In conclusion, the available evidence indicates that MD may be associated with less severe forms of psoriasis and/or psoriatic arthritis. Bearing in mind that reduced severity was independent of body mass index in several studies,[4–7] it is possible that the beneficial effects of this dietary pattern are due to more than mere weight loss. However, more experimental longitudinal studies will be necessary to consolidate these findings and to precisely define the role of MD in the treatment of this disease.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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