

1H-NMR metabolomic study: Effect of very-low-calorie ketogenic diet on psoriasis patients

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Abstract

Psoriasis is an inflammatory and multifaceted disease of the epidermis based on an immunological mechanism involving Langerhans cells and T lymphocytes that produce pro-inflammatory cytokines. Genetic factors, environmental factors, and improper nutrition are considered triggers of the disease. Numerous studies have reported that in a high number of patients, psoriasis is associated with obesity. Excess adipose tissue, typical of obesity, causes a systemic inflammatory status coming from the inflammatory active adipose tissue; therefore, weight reduction is a strategy to fight this pro-inflammatory state.

We performed a NMR metabolomic study in order to evaluate how a nutritional regimen based on a ketogenic diet, characterized by a reduction in carbohydrates and a relative increase in protein and fat, influences the clinical parameters, metabolic profile, and inflammatory state of psoriasis patients. Thirty (30) psoriasis patients were subjected to a ketogenic nutritional regimen and monitored for 4 weeks by evaluating the clinical data, biochemical and clinical parameters, NMR metabolomic profile, and IL-2, IL-1 β , TNF- α , IFN- γ , and IL-4 concentrations before and after the nutritional regimen. Metabolomic profiles of psoriasis patients compared to those of healthy controls before and after a 4 week ketogenic diet provided preliminary indications to identify candidate biomarkers useful in the theranostic control of psoriasis. Results of the metabolic pathway analysis reveal the therapeutic potential of a dietary regimen and provide new insights into the etiopathogenesis of psoriasis.

Manuela Grimaldi is a Researcher at the Department of Pharmacy at University of Salerno, involved in the realization of a project entitled "NMR metabolomic characterization of cancerous tissues and biological fluids." In 2007 she graduated in Pharmaceutical Chemistry and Technologies and in the following years she obtained the Specialization in Hospital Pharmacy and the PhD in Pharmaceutical Sciences with a thesis entitled "NMR study of protein-ligand interaction".

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