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Very low-calorie ketogenic diet may allow restoring response to systemic therapy in relapsing plaque psoriasis

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Summary Psoriasis is a chronic disease associated with overweight/obesity and related cardiometabolic complications. The link between these diseases is likely the inflammatory background associated with adipose tissue, particularly the visceral one. Accordingly, previous studies have demonstrated that in the long-term weight loss may improve the response to systemic therapies. We report a case report of a woman in her 40s suffering from relapsing moderate-to-severe plaque psoriasis and obesity-related metabolic syndrome, in whom adequate response to ongoing treatment with biological therapy (adalimumab) was restored after only 4 weeks of very low-calorie, carbohydrate-free (ketogenic), protein-based diet. Accordingly, through rapid and consistent weight loss, very low calorie ketogenic diet may allow restoring a quick response to systemic therapy in a patient suffering from relapsing psoriasis. This intervention should be considered in overweight/obese patients before the rearrangement of systemic therapy. Nonetheless, studies are required to evaluate whether very low calorie ketogenic diets should be preferred to common low-calorie diets to improve the response to systemic therapy at least in patients with moderate-to-severe psoriasis.

Introduction

With a prevalence of about 3%, psoriasis is a chronic inflammatory disease that mainly affects the skin

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[1]. In the last decade, moderate to severe psoriasis has been successfully treated with biologic agents [2,3]. These drugs primarily target the tumour necrosis factor-α (TNF-α; etanercept, adalimumab and infliximab) or the p40 subunit of interleukin IL-12 and IL-23 (ustekinumab) to block the immune response at the basis of the disease. Despite their introduction some patients fail to achieve adequate response and treatment guidelines suggest titration to higher dosage or switching to a second-line biologic agent or combining biologic therapy with other systemic immunosuppressive medications [3]. Psoriasis is currently considered a multifactorial disease. Genetic susceptibility seems to play a predominant role but other contributing factors have been identified [1,4]. It can be associated with comorbidities including metabolic disorders as insulin resistance [4—6]. As psoriatic disease was found to be associated with overweight/obesity and related complications, a role for concomitant weight loss has been hypothesised and initially tested [6]. Particularly, studies have demonstrated that adherence to low-calorie dietary regimens can not only enhance the efficacy of treatment therapy but also improve response to them [7]. The rationale of this intervention is likely to rely on the role weight loss has in reducing adipose tissue depots which are a source of pro-inflammatory cytokines, such as TNF-α [6,8]. In respect to the inflammatory background associated with overweight and obesity, previous studies have shown the intra-abdominal adipose tissue is the main contributor [8]. In this perspective, it is also worth reporting that very low-calorie diet (VLCD) with adequate protein content are likely to produce more favourable reductions in body weight, fat mass and fat-free mass, particularly in the short-term, thus resulting in greater improvement of cardio-metabolic profile [9—11]. With this background of considerations, the role of short-term enteral treatment with a very low-calorie, carbohydrate-free, protein-based formula in the management of obesity has been recently investigated [12,13]. This intervention was found to be highly effective in reducing body weight and visceral fat and improving metabolic disorders. Here, we report a case of recurrent plaque psoriasis which has been successfully treated with VLC protein-based, ketogenic enteral nutrition before optimising the systemic therapy.

Report of a case

This study was approved by the institutional review board. Patient written informed consent was obtained, in compliance with the Declaration of Helsinki principles.

A woman in her 40s, suffering from recurrent plaque psoriasis and psoriatic arthritis (enthesitis) was referred by dermatologists to the Clinical Nutrition Unit of the A.O.R.N. ''San Giuseppe Moscati'' for obesity complicated by dyslipidemia and metabolic syndrome. Up to six months before referral, she has been successfully treated with biologic therapy (subcutaneous adalimumab, 80 mg for 1 week then, 40 mg every 2 weeks) for 12 months. At inception of treatment with biologic agents Psoriasis Area and Severity Index (PASI) was 37 and a complete response (PASI = 0) was achieved after 3 months. A complete resolution of psoriatic arthralgia was also achieved with a reduction of visual analogue scale-pain (range, 0—100) from 80 to 0. At disease's relapse, skin lesions were mainly localised at scalp, limbs, and submammary folds (Figs. 1 and 2A). Unfortunately, it was not possible to consider the combination with other systemic drugs because, prior to biological therapy, the patient had complained of intolerable side effects to treatment with cyclosporine (heavy headaches) and had not responded to methotrexate and acitretin. Accordingly, before considering the use of higher doses of the ongoing biologic therapy or switching to a second-line biologic agent the patient was treated with VLC, protein-based, ketogenic enteral nutrition. Particularly, the patient was prescribed a home-made, liquid, carbohydrate-free, low-fat nutritional formula containing a fixed amount of branched-chain amino acids (10 g), glutamine (5 g) and milk proteins (Protifar®; Nutricia, Italia) in order to reach a total protein content of 1.2 g per kilogram of ideal body weight (total calorie content, ∼300 kcal/day) [12,13]. A complete multivitamin—multimineral supplement and alkalising substances were also provided. The administration of the formula was performed continuously (24 h a day) for 4 weeks by means of a polyurethane (8-French) nasogastric tube connected to a peristaltic feeding pump. Then, the patient was asked to adhere to a low-calorie, normal-protein diet (1200 kcal/day) for 6 weeks before undergoing a second 4-week cycle of VLC protein-based, ketogenic enteral nutrition. Additional details on this dietary regimen have been provided elsewhere [12,13].

After the first cycle of enteral nutrition, along with a significant weight loss (∼12% of initial body weight) and a reduction in visceral adiposity (as quantified by the echographic evaluation of a surrogate measure [aorto-mesenteric visceral fat thickness, AMFT]) [14], we observed