

Severity of Psoriasis and Body Mass Index: The Cut off are Overweight Patients rather Than Obese Ones

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Abstract

Background: Obesity has been found to be associated with an increased risk of psoriasis in general population. However, studies addressing the relationship between obesity and clinical severity of psoriasis are still scarce and confused.

Objective: In this study, we investigated the relationship between levels of overweight and the clinical severity of psoriasis in Caucasian patients.

Methods: This study involved a total of 300 patients with chronic plaque psoriasis. Their body mass index (BMI) was calculated as weight in kilograms divided by height in squared metres and was categorized into four groups (BMI < 25, normal; 25 < BMI < 30, overweight; BMI > 30, obesity). Disease severity was assessed by Psoriasis Area and Severity Index.

Results: The correlation between PASI score and BMI was statistically significant between overweight and normoweight patients.

Discussion and Conclusions: Both psoriasis and obesity are chronic diseases with a high impact on social cost and quality of life. Both PASI score and BMI have to be correctly evaluated to administer a proper treatment, because overweight psoriasis patients do represent a risk category for severe psoriasis.

Keywords: Psoriasis; BMI; Obesity; Overweight; PASI

Introduction

Psoriasis is a chronic inflammatory skin disease with complex aetiology involving genetic-environmental interactions [1]. It is widely accepted that genetic-environmental interaction, multifactorial heredity, plays a role in the development of psoriasis. Although the genetic influence on psoriasis is well established, the role of environmental factors is less precisely defined. Smoking habits, alcohol consumption, diet, body mass index (BMI), stressful life events, and infections have been repeatedly considered as potentially important causative factors (2). Obesity and related metabolic conditions are of epidemic proportions in most of the world, affecting both adults and children. Several studies have revealed an association between obesity and psoriasis either in the general population or in clinical settings [1-3].

Obesity can induce overproduction of multiple pro-inflammatory cytokines in adipose tissue, including tumour necrosis factor (TNF- α), interleukin (IL)-6, IL-8 and reactive C protein which are implicated in the pathogenesis of psoriasis [4]. Moreover aberrant TNF α production and TNF receptor signalling have been associated with the pathogenesis of both pathologies and several other diseases [5].

Not only obesity may be associated with higher psoriasis incidence and activity, and prevalence of obesity-related syndromes, but it may also influence the therapeutic approach to disease and the clinical response to systemic treatment, in fact, for a variety of reasons, obese persons with psoriasis are often more difficult to treat [6]. The aim of our work was to establish if obese patients presented a more aggressive psoriasis and how BMI correlated with PASI (Psoriasis Area and Severity Index), the score more used to evaluate the clinical severity of psoriasis.

Materials and Methods

Study population

This was an outpatient-based study, performed between November 2009 and July 2010 at the Department of Dermatology in Florence. All recruited patients were affected by psoriasis and were visited by a senior staff dermatologist (F.P.). There were no exclusion criteria about age, gender, type of psoriasis and duration of the disease. We considered only patients affected by psoriasis without any systemic treatment in order to better define the PASI score at time 0. A full verbal explanation of the study was given to all eligible patients. Institutional review boards approved the study and all participants gave written informed consent at enrolment.

Clinical evaluation

The clinical severity of psoriasis was assessed according to PASI, which is a quantitative measure of the average erythema, infiltration and desquamation of the lesions, weighted by the area of involvement [7]. To avoid interobserver variations, PASI scores were determined for each patient by F.P. Severity of psoriasis was divided into four categories based on quartiles of PASI scores distribution (0.0-3.9, 4.0-

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Received September 17, 2012; Accepted November 27, 2012; Published November 30, 2012

Citation: Lara T, Federica R, Leonardo P, Gionata B, Francesca P (2012) Severity of Psoriasis and Body Mass Index: The Cut off are Overweight Patients rather Than Obese Ones. J Clin Exp Dermatol Res 3:165. doi:10.4172/2155-9554.1000165

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7.9, 8.0-15.9, and >16.0), representing four ordinal levels of increasing clinical severity.

Definition of overweight and obesity

Measurements of height and bodyweight were taken by a trained research staff for each patient. Height was measured to the nearest millimetre and weight was measured to the nearest 0.1 kg.

The BMI was calculated as weight in kilograms divided by height in squared metres and was categorized into three groups: normal weight was defined as BMI <25 kg/m²; overweight was defined as 25 kg/m²< BMI >29.99 kg/m²; obesity was defined as BMI >30 kg/m².

Statistical analysis

The software used to collect the data was Excel. Data were analyzed using the statistical software SPSS (version 16.01; SPSS Inc, Chicago, IL, USA). Data were expressed, if necessary, as mean ± standard deviation (SD) or percentage. Two sided unpaired Student's *t*-test was performed for comparison analysis between patient's normoweight, overweight and obese. *P*-values <0.05 were considered significant.

Results

285 psoriatic outpatients, mean age 53.1 (ranging between 12 and 89 years old), 142 (49.8%) male were enrolled. During the first clinical examination PASI and BMI were calculated for each patient. 49 patients (17%) had a PASI ranging between 0 and 3.9; 129 patients (46%) between 4 and 7.9; 79 patients (28%) between 8 and 15.9 and 24 patients (9%) over 16. Moreover 134 patients (47.5%) had a BMI lower than 25; 107 patients (37.5%) had a BMI ranging between 25 and 29.9 and 42 patients (15%) had a BMI over 30. The correlation between BMI and PASI in the above mentioned population is showed in table 1. The difference in PASI score between overweight and normal weight patients (*p* value=0.009) was statistically significant. On the other hand no difference has been demonstrated between normoweight and obese patients (Table 2).

Discussion

The first associations between psoriasis and obesity originated from major epidemiological studies conducted in Europe [1,8,9]. In 1986, a first Scandinavian study showed an increased prevalence of obesity in women with psoriasis [10]. A pioneer American study (Utah) demonstrated that the prevalence of obesity in patients with psoriasis (34%) is higher than in the general population (18%) [2].

Obesity is currently a growing epidemic health problem in the Western world. It is often associated with tendency to develop

	BMI <25	25< BMI <29.9	BMI >30
0< PASI <3.9	22.5 %	11 %	14.5 %
4< PASI <7.9	52 %	44 %	43 %
8< PASI <15.9	19.5%	34.5%	28%
PASI >16	6%	10.5 %	14.5 %

Table 1: Correlation between PASI score and BMI in our patients group.

Population	Overweight (25< BMI >30)	Normoweight (BMI <25)	Obese (BMI >30)
PASI score (mean ± SD)	8.2 ± 5.08	6.7 ± 4.96	8.5 ± 6.15
<i>p</i> - value	0.009	0.04	

**P*< 0.05 was considered statistically significant

Table 2: Correlation of PASI score with body weight.

dyslipidemia, diabetes, cardiovascular diseases and in general a state of chronic inflammation which, when present, worsens psoriasis [11]. This state of chronic inflammation is often associated to liver steatosis; recent drugs as TNF-alpha blockers are not able to stop the chronic inflammation as reported by Di Minno et al. [12]. Moreover, the systemic inflammation of psoriatic patients exhibits low circulating levels of insulin-like growth factor (IGF-1), a marker of metabolic syndrome in the general population [13]. It is also reported [14] that there is a correlation between the metabolic status and anti-apoptotic Bcl-2 serum concentrations, to further support the relevance of an on-going inflammatory status in obese patients. Based on the guidelines in effect, BMI between 25 and 29.99 indicates overweight; BMI above than or equal to 30 indicates obesity and BMI above than or equal to 40 points shows severe or morbid obesity [15,16].

It is important to emphasize that obesity, as defined by BMI, does not include patients with clear metabolic alterations that are within the proper weight range for their height, such as cases in which there is excessive abdominal fat (centripetal obesity) [17].

Obesity is the result of an interaction between genetic and environmental factors. BMI variation can be attributed to environmental factors in 60 to 70% of the cases, whereas genetic factors are responsible for 30 to 40%. Weight gain would be the result of a confluence of factors such as low calorie burn associated with sedentarism, little physical activity, and high respiratory coefficient (carbohydrate-to-fat oxidation ratio). Lastly, obesity results from an imbalance between food intake and calorie burn [18].

Conclusions

Both obesity and psoriasis are chronic diseases which require high cost treatment and affect quality of life. It has been reported [11] that improving obesity also psoriasis improves. The aim of our study was to evaluate if psoriasis patients with an elevated BMI do also have and increased PASI. The originality of our study is that psoriasis severity, in terms of PASI, was more statistically significant between overweight and normoweight patients than between obese and normoweight patients. These results highlight the importance of considering PASI and BMI together and the qualified dermatologist has to face with the fact that in treating psoriasis attention has to be paid also to "weight gain" and to select treatments which do not contribute (or worsen) the tendency to increase BMI.

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