

Assessment of Obesity in Chronic Plaque Psoriasis Patients in Comparison with the Control Group

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Abstract Background: Some evidences support the relationship between obesity, body fat distribution and psoriasis disease and its severity. This relationship is not fully demonstrated yet; such study has never been published in the middle-east. **Methods:** Among people who were referred to the Imam Reza Hospital dermatology ward and clinic during 2007 through 2009, 79 psoriatic patients and also 83 of age and sex matched people for the control group were chosen. Assessment of body fat distribution was done by bioelectrical impedance analysis (BIA) device. **Results:** Among the patient group there were more obese and very obese people ($p=0.001$). In patient group, waist to hip ratio (WHR), Percentage of trunk fat and Waist circumference were significantly higher than control group ($p=0.045$). **Conclusion:** Knowing that genetic and environmental factors contribute to fatness, it seems that in the middle-east also overweight and obesity are in direct relation with psoriasis.

Key words: Psoriasis • Obesity • Nutrition • Body Composition

INTRODUCTION

Psoriasis involves 2-3 % of population in worldwide and outbreak of disease among men and women is equal [1]. Psoriatic lesions were detected in the mummy bodies that belong to Christianity period. In 1818, Alibert indicated the relationship between Psoriasis and joint disorders (arthropathic psoriasis) [2]. Epidemiologic studies have showed that Psoriasis increases the risk of co-morbidities and mortalities. Recent studies have showed increased risk of cardio vascular disease (CVD) and metabolic disorders such as diabetes, obesity, dyslipidemia and hypertension in Psoriasis. Younger

patients with severe psoriasis have a higher risk of myocardial infarction (MI). According to cross-sectional and case-control studies, fat deposition can increase the risk of Psoriasis. Also relationship between body mass index (BMI) and psoriasis has been mentioned [3-6]. Some studies have reported that patients with severe psoriasis are frequently obese. Henseler and Christophers in 1995 suggested a correlation between psoriasis and obesity [7, 8].

In recent years obesity and related measurable parameters have kindled a particular attention in psoriatic patients. Many aspects of this relationship are not still clearly determined and most of published literatures in

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this particular domain, suggest that more survey should be done [3, 6]. Obesity can lead to a higher risk of developing psoriasis and a poorer clinical outcome of psoriasis in long-term and losing weight may improve the psoriasis [9].

This is reported that obesity seems to be common in patients with psoriasis, but the relationship is somewhat unclear. Obese and psoriatic patients share certain comorbidities, such as type 2 diabetes mellitus, dyslipidemia, hypertension and cardiovascular disease [10].

Lindegard B described an association between obesity and psoriasis in a study of registered Swedish citizens over a 10-year period for first time [11].

Naldi L. *et al.* [12] in their study confirm that smoking, BMI and stressful life events are independently correlated with psoriasis and that their risks combine according to a multiplicative model without evidence for statistical interaction. In this study the odds of having psoriasis with a BMI between 26 and 29 or above 30 were 1.6 and 1.9, respectively, compared to noobese control subjects.

Often patients with psoriasis, in particular those requiring systemic treatment, have a weight above normal weight. Obesity of psoriatic patients contributes significantly to the increased cardiovascular risk in these patients.

In patients with increasing weight, especially above 100 kg, optimal responses with fixed dose biological agents are less frequent. Body weight effect on drug clearance might partly account for this fact [13].

Patterns of fat distribution in body could determine different risks for individuals. For example fat accumulation in hip region can increase the risk of psoriasis rather than in waist. As well as psoriasis, obesity is influenced by many environmental and inherent factors that are variable in different communities 60-70 percent of changes in BMI are related to bioenvironmental factors but genetic factors consists only 30-40 of factors (5, 6, 8). Dr Nick Finer reported that obesity is created by a combination of our genes, decreased physical activity and an overconsumption of energy-dense food [14]; Thus it is important to survey this relationship in our area. In present study we want to survey the obesity and its related parameters in psoriatic patients.

MATERIALS AND METHODS

This case-control study was done in Mashhad Emam Reza hospital.

Subjects: Understudy population were chronic plaque psoriatic patients attending department of dermatology of Mashhad Emam Reza hospital. A questionnaire form by two case and control groups was completed that includes demographic features and also some co-morbidity such as Hypertension, hyperlipidemia, diabetes and heart stroke and information of BMI, weight, fat distribution, age, gender were accumulated. Subjects that have psoriasis according to history and clinical features based on dermatologist diagnosis and have consent to participate in the study were imported in case group. Severity of disease was estimated for each case by psoriasis area severity index (PASI).

Age and sex matched control group were adapted among peoples attending our hospital for any reason and based on clinical exam were not involved with psoriasis. Inclusion criteria of our subjects were diagnosis of psoriasis and age between 18 to 65 years old. Exclusion criteria of our study for both groups were:

- Acute and severe disease in past year that influence their weight
- Consumption of drugs that influence weight
- Subjects on certain diets.
- Pregnancy or lactation

Anthropometric Parameters: All subjects were measured for height, waist and hip circumference (in centimeters) and weighed in kilograms using a stand-on BIA (Tanita-418 body composition analyzer, Tanita Corp., Tokyo, Japan). Subjects refer to a nutritionist for these measurements with BIA. The latter were also used to estimate percentage of body fat. BMI was calculated. Physiological factors such as exercise and food intake could influence the BIA results up to 2.6% Therefore in all subjects, we used the same device and under the constant conditions, fasted and before exercise The precision of this BIA was good (CV was <1%).

Different body sizes were measured with a plastic tape as the following:

- Smallest waist circumference over the umbilicus level,
- Widest hip circumference, at the level of the anterior superior iliac spine
- Highest thigh circumference.

WHR was obtained using the ratio of waist to hip circumference.

Patients were classified to seven groups according to BMI and percentage of body fat, which include very obese, obese, underweight, normal, muscular overweight, under fat underweight and muscular underweight.

Statistics Analysis: We proposed our data into SPSS software (SPSS Science, Apache Software Foundation, Chicago, IL). We have used independent sample T and chi-square tests for data analysis. The significant level was 0.05.

RESULTS

Our subjects include 79 psoriatic chronic plaque patients consist of 41 women and 43 men (49.4 and 50.6 % respectively) and 83 apparently healthy subjects were studied that consist of 42 women and 37 men (53.2 and 46.8 % respectively). Distribution of gender between two groups has not any significant different (P-value 0.756). Age of our patient group is in range of 10 to 71 years and in mean 36.56 ± 1.40 years. And in control is in range of 10 to 68 years and in mean 36.56 ± 1.39 years. Results of

independent sample T test show that average of age between two groups has not any significant different (P-value 0.999).

Table 1 shows the percentage of very obese, obese, underweight, normal and muscular overweight, under fat underweight and muscular underweight, which are types of bodies that were determined by BIA. Subjects with very obese, obese, muscular overweight and under fat underweight bodies in patient groups have significantly higher percentage but Subjects with normal, muscular underweight and underweight bodies are significantly higher in control group (P-value=0.001).

Comparison of co-morbidities between patients and healthy subjects is present in Table 2. Results showed that percentage of patient group without co-morbidities was 82.3 % and in control group was 90.4 %. Except for hypertension other co-morbidities in patient group were significantly higher than control group (p= 0.045).

Table 3 showed the comparison of anthropometric features between patients and healthy subjects. This results shows that BMI and WHR and Percentage of body fat (PBF) were not significantly different between

Table 1: Comparison of obesity between patients and healthy subjects

Types of bodies	Understudy subjects						P-value
	Patients		Healthy subjects		Total		
	Number	Percentage	Number	Percentage	Number	Percentage	
Very obese	4	5.1	0	0	4	2.5	0.001
Obese	45	57	29	34.9	68	42	
Underweight	0	0	2	2.4	2	1.2	
Normal	25	31.6	41	49.4	72	44.4	
Muscular overweight	1	1.3	1	1.2	2	1.2	
Under fat underweight	1	1.3	1	1.2	2	1.2	
Muscular underweight	3	3.8	9	10.8	12	7.4	
Total	79	100	83	100	162	100	

Values are expressed as number and percentage. Chi-square test was used for compare the obesity between the patients and healthy subjects. Results show that percentage of obesity is significantly higher in patient group.

Table 2: Comparison of co-morbidities between patients and healthy subjects

Co-morbidities	Understudy subjects						P-value
	Patients		Healthy subjects		Total		
	Number	Percentage	Number	Percentage	Number	Percentage	
Without disease	65	82.3	75	90.4	140	86.4	0.045
Hypertension	1	1.3	3	3.6	4	2.5	
Hyperlipidemia	2	2.5	1	1.2	30	1.9	
Diabetes	2	2.5	0	0	2	1.2	
Heart Stroke	2	2.5	2	2.4	4	2.5	
Diabetes and hyperlipidemia	4	5.1	1	1.2	5	3.1	
Total	79	100	83	100	162	100	

Values are expressed as number and percentage. Chi-square test was used for compare the obesity between the patients and healthy subjects. Results show that prevalence of mot co-morbidities in patients is significantly higher than control.

Table 3: comparison of anthropometric features between patients and healthy subjects

Factor	Subjects		P-value
	Patient	Control	
BMI	25.7±4.40	24.5 ± 1.40	0.070
Percentage of body fat (PBF)	26.00 ± 7.60	24.70 ± 7.17	0.510
Percentage of trunk fat	10.20 ± 4.02	8.16 ± 3.51	0.001
Waist circumference	92.57±11.50	88.40 ± 9.20	0.013
WHR	0.88±.080	.82 ±.060	0.001

Values are expressed as mean ± SD. Independent sample T test was used for comparing the anthropometric features between the patients and healthy subjects. There were significant differences between the patients and healthy subjects in WHR, Percentage of trunk fat and Waist circumference.

two groups (p=0.070, 0.001 and 0.510 respectively). Percentage of trunk fat was significantly higher in patient group rather than control group (10.20 ± 4.02 vs. 8.16 ± 3.51) (p= 0.001). Also waist circumference was significantly higher in patient group rather than control group (92.57±11.50 vs 88.40±9.20) (p=0.013). In regard to the relationship between anthropometric features and PASI, our results showed that BMI, PBF and amount of distribution of fat in trunk and organs have a significant relationship with PASI.

DISCUSSION

Present study suggested a relationship between obesity/overweight and psoriasis that is similar to results of previous studies [15-17]. Our results showed that prevalence of obese and very obese patients were higher in patients in comparison of healthy subjects and also waist circumference was higher in case rather than control group. Also our results indicated that PASI has a significant relationship with BMI and PBF and amount of distribution of fat in trunk and organs. BMI cannot determine type of obesity or distribution of fat in body (for example central obesity), thus we used BIA in our study. Same results to our study were obtained from following studies.

Relation between obesity and psoriasis early derived from epidemiologic studies in Europe in 1986, the first Scandinavia project, investigated the prevalence of obesity in women with psoriasis. Then after two American studies showed that percent of psoriatic patients with obesity was significantly higher than control group [18].

Obesity is prevalent among psoriatic patients and it is shown that have roles in many aspects of this disease.. Results of the study in 2006 indicated that BMI and WHR have a positive relationship with the odds of occurrence of psoriasis [17]. In psoriasis patients, obesity is

associated with a more severe disease. Thus body weight control may be important for the management of psoriasis. Correct understanding of relationship between obesity and psoriasis can help to access a proper perspective of social health [3].

Experimental studies on animal and human showed that weight reduction and control of obesity lead to improvement of psoriasis. Obesity and overweight are known in related to psoriasis or as worsening factors [16, 19, 20].

CONCLUSION

In summary in regard to effect of genetic and environmental factors on obesity and its determinants, we have surveyed the relationship between obesity and psoriasis in our region and we found the association between obesity and psoriasis and also this fact that probably psoriasis has a more severity in obese patients.

ACKNOWLEDGEMENT

This study has been financially supported by a grant from Mashhad University of Medical Sciences. We would like to thank all the patients for participating in this study.

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