The Prevalence of Insulin Resistance in Patients with Psoriasis

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Abstract

Objective: Psoriasis is a chronic inflammatory disease. It may cause poor quality of life. The purpose of this study was to determine the prevalence of insulin resistance in patients with psoriasis to clarify the relationship between insulin resistance and psoriasis.

Materials and Methods: This case-control study was conducted on 110 patients with psoriasis and 110 healthy people. Fasting serum glucose and serum insulin levels were measured in both groups. The mean fasting serum glucose and serum insulin levels were measured in patients and controls and the prevalence of diabetes was calculated in both groups. Insulin resistance index was calculated with HOMA-IR formula.

Results: The mean fasting blood sugar was 106 mg/dl in patient group and 103.93 in the control group. The mean serum levels of insulin in the patient group was 10.27 (*P*-value: 0.679) and in the control group was 8.22 (*P*-value: 0.107). In psoriatic patients, 11 were diabetic (10%) and 13 (11.8%) in healthy group. Insulin resistance was found in 46.4% of patients (*P*-value: 0.665) and 39.1% of controls (*P*-value: 0.276).

Conclusion: According to the recent study there was no association between psoriasis and insulin resistance and also diabetes.

Keywords: Psoriasis, Insulin resistance, Diabetes.

Introduction

Psoriasis is a chronic, inflammatory disease characterized by erythematous scaly plaques that affect the scalp, trunk, extensor surfaces of the limbs, and the genital area. Psoriasis prevalence is about 2 to 3% in adult population. It is associated with decreased quality of life, even in patients with limited body surface area disease. (1)

Diabetes mellitus (DM) is the most common metabolic diseases. Diabetes is a health problem in developed countries and in developing countries. DM is the seventh leading cause of death in the United States. DM is the leading cause of blindness (12,000 to 24,000 per year) and also renal failure (40% of new cases). With early detection of diabetes and appropriate treatment the complications of diabetes may be delayed or even prevented. (2)

In 2002, the prevalence of diabetes in people over 30 years old living in urban areas of Yazd

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province was 14.52%. The prevalence of impaired glucose tolerance (IGT) was 10.8%. (3) In 2012, the prevalence of diabetes in Yazd was 16.3%. (4)

The association between psoriasis and risk of diabetes has been examined in numerous epidemiologic studies. A marked increased risk of diabetes was found in individuals with psoriasis. (10-17) In contrast, a few studies have suggested that psoriasis is not associated with an increased risk of diabetes. The reasons for this difference are not quite clear but may be due to inadequate studied sample size and the severity of psoriasis.

The purpose of this study was to determine the prevalence of insulin resistance in patients with psoriasis to clarify the relationship between insulin resistance and psoriasis.

Materials and Methods

This study is a case-control study. Psoriatic patients who were referred to dermatologic clinic of Shahid Sadoughi University of Medical Sciences, after completing the questionnaire were referred to Yazd central laboratory for testing the fasting serum glucose (FBS) and serum insulin levels.

The control groups were selected from persons without psoriasis and after adjusting for age and sex with patient group, they were referred to Yazd central laboratory for testing FBS and serum insulin levels. The results were analyzed with SPSS18 and chi-square tests.

In this study, 110 patients with psoriasis and 110 individuals without psoriasis were included. To determine insulin resistance, the formula of Homeostasis model assessment-insulin resistance (HOMA-IR) was used. (5) In this formula for determining insulin resistance FBS and serum levels of fasting insulin is used and the results more than 1.8 is considered to be insulin resistance and 1.8 or less than 1.8, is considered to be healthy.

Results

Totally 110 psoriatic patients who 74 (67.3%) were males and 36 were (32.7%) females and 110 healthy individuals were enrolled after adjusting for age and sex.

The mean of FBS was 106.08±46 mg/dl in the patient group and 103.93±28 in the control group. This difference was not statistically significant according to the t-test. (P-value: 0.679)

The mean of serum level of insulin was 10.27±10.23 in the patient group and 8.22±8.47 in the control group. The difference in the t-test was statistically not significant. (P-value: 0.107)

HOMA formula results in 43 control subjects and 51 patients were greater than 1.8 and in 67 control subjects and 59 patients were less than 1.8. So, there was Insulin resistance in 46.4% of patients and 39.1% of the control group. This difference was not statistically significant by Chi-Square test (*P*-value: 0.276). (Figure 1)

In psoriatic patients, 11 were diabetic (10%) and the control group, 13 patients were diabetic (11.8%). The difference in the Chi-Square test was not statistically significant. (*P*-value: 0.66) (Figure 2)

Discussion

The frequency of psoriasis in most societies is almost identical (1). In this study 110 patients with psoriasis were involved that 67.3% of them were males and 32.7% were females. This difference may be due to referring more men to the clinic for treatment and further participation in the study.

In this study, the insulin resistance frequency was 46.4% and 39.1% of controls although this value in patients with psoriasis is greater than the control group but this difference was not statistically significant (*P*-value: 0.276). In our study, 1.8 was the cut point of HOMA formula (5). The mean serum levels of insulin in the patient group was 10.27 ng/dl and the control group was 8.22 ng/dl. This value was higher in the patient group but the difference was not statistically significant (*P*-value: 0.107).

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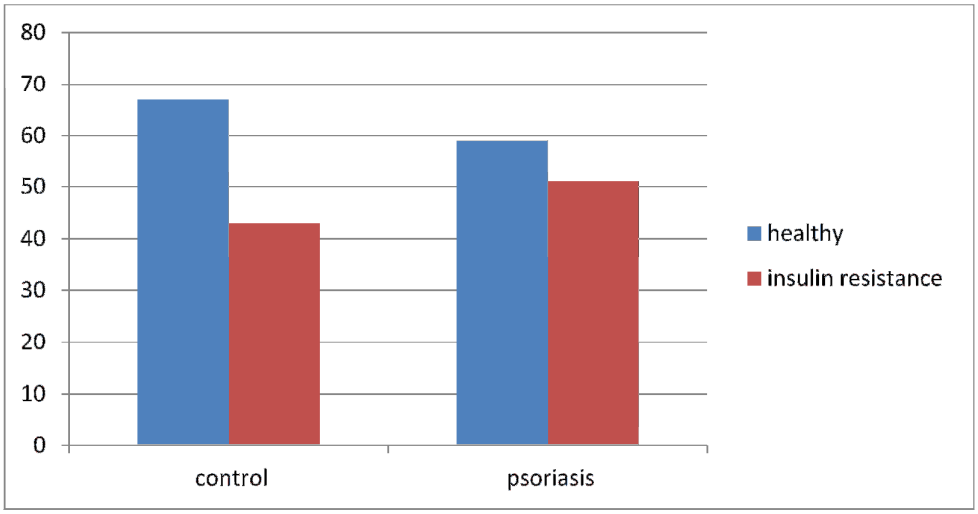


Figure 1. Insulin resistance by HOMA formula results in psoriatic patients and control

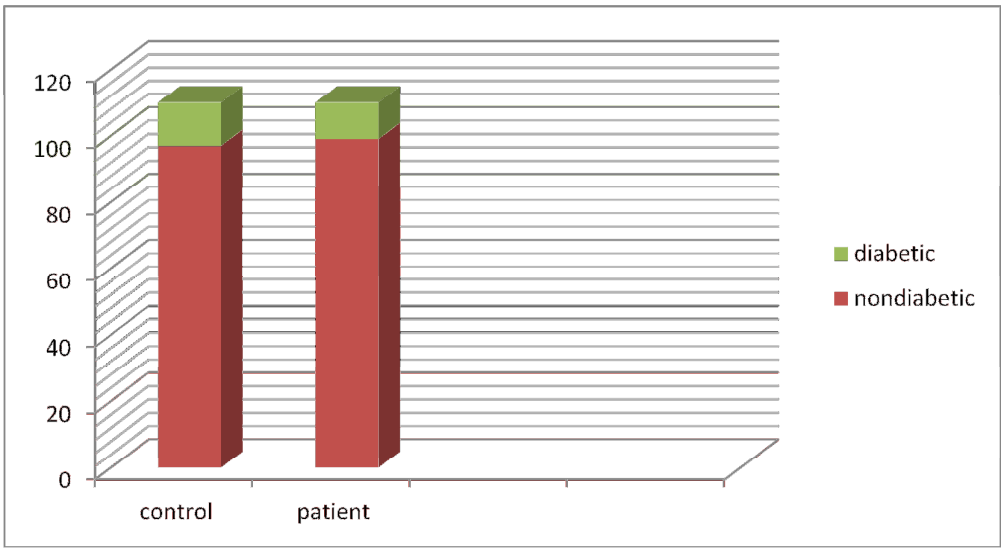


Figure 2. Diabetes in psoriatic patients and control group

In recent study, 11 patients with psoriasis had diabetes (10%) and 13 healthy individuals had diabetes (11.8%). This difference was not statistically significant (*P*-value: 0.665). These results may be due to the high frequency of diabetes is Yazd as the frequency of diabetes in the population over 30 years it is 16.3% (3,4).

The results of some of studies are in line with our study. F. MalekZad et al in 2011 in Iran (6) and also in 2003, a study that was conducted by Reynosa von Dreteln et al, There was no association between psoriasis and insulin resistance (7). Similar to our study, the study of Brenelli SL and colleagues in 1995, there was not any significant difference in mean blood glucose levels in patients with psoriasis and healthy controls. In contrast, serum insulin level was significantly higher in patients with psoriasis compared with controls that showed insulin resistance (8).

In the study of Martin H et al in 1966 that was conducted on 96 patients, there was not any association between psoriasis and diabetes mellitus (9).

Contrary to above studies, in most studies, psoriasis was proposed as a risk factor for developing diabetes and insulin resistance.

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In a meta-analysis study that Juan-chery et al carried out in recent years which was the result of 22 articles and 3,307,516 patients with psoriasis, The risk of diabetes in patients was moderate and diabetes was 1.42 fold .(10)
In another meta-analysis study, the association between psoriasis and diabetes were observed and in severe cases of the disease and in psoriasis associated with arthritis, the association was higher. (11)
In similar studies in different parts of the world and with different samples, these recent results were confirmed. (12-17) and in some studies, the risk was greater among women. (13,18)
Many studies were done on the association between psoriasis and insulin resistance. In most cases, insulin levels were higher in patients with psoriasis and also resistance to insulin. (19-21,8) In patients with severe psoriasis, this association is more clear. (19)
In our study, in contrast to these studies, there was no difference of insulin resistance in the patients group and controls. The high frequency of diabetes and insulin resistance in Yazd or different sex and age in similar studies can be the reasons for this lack of association.

Conclusion

According to the recent study there is no association between psoriasis and insulin resistance and also diabetes. Based on the results of numerous studies around the world it seems that similar studies with larger samples in different countries are needed to further evaluate the relationship between psoriasis and insulin resistance and also the association of this disease with diabetes.

References

1. Griffiths CEM, Barker JNWN. psoriasis in Rook's textbook of dermatology. Wiley – black well 2010;20:1-60.
2. http://www.iransrc.com/articles/diabet2.htm
3. Afkhmi-ardekani M, Vahidi A, Ahmadieh M. Evaluation of the epidemiologic indexes of adult diabetes melitus in population older than 30 years in yazdprovince, Iran. Journal of Sadoughi University of medical science, 2002;1:22-7 (in Persian).
4. Lotfi MH, Saadati H, Afzali M. Prevalence of Diabetes in People aged ≥30 years: The Results of Screening Program of Yazd Province, Iran, in 2012. J Res Health Sci. 2014;14(1):88-92.
5. http://en.wikipedia.org/wiki/Homeostatic_model_assessment#cite_note-Rudenski-3
6. Malekzad F. Insulin resistance in psoriasis: A case-control study. Iran J Dermatol 2011;14:136-9.
7. Claudia Reynoso-von Drateln. Lipid profile, insulin secretion, and insulin sensitivity in psoriasis. Jam Acad Dermatol 2003;48:882-5.
8. Brenelli SL. Insulin resistance in psoriasis. Braz J Med Biol Res. 1995;28(3):297-301.
9. Martin H. Brownstein MD. Psoriasis and Diabetes Mellitus. Arch Dermatol. 1966;93(6):654-655.
10. Cheng J , Kuai D, Zhang L. Psoriasis increased the risk of diabetes: a meta-analysis. Arch Dermatol Res 2012;304:119-25.
11. Coto-Segura P. Psoriasis, psoriatic arthritis and type 2 diabetes mellitus: a systematic review and meta-analysis. British Journal of Dermatology 2013;169:783-93.
12. Rahat S. Increased Risk of Diabetes Mellitus and Likelihood of Receiving Diabetes Mellitus Treatment in Patients With Psoriasis. Arch Dermatol. 2012;148(9):995-1000.
13. Wenqing Li. Psoriasis and risk of type 2 diabetes among women and men in the United States: a population-based cohort study. J Invest Dermatol. 2012;132(2):291-8.
14. Meng-Sui Lee. Increased risk of diabetes mellitus in relation to the severity of psoriasis, concomitant medication, and Co morbidity: A nationwide population-based cohort study. J Am Acad Dermatol 2014;70:691-8.
15. Rickson R Pereira1, Sangeeta T Amladi2, Prema K Varthakavi. A study of the prevalence of diabetes, insulin resistance, lipid abnormalities, and cardiovascular risk factors in patients with chronic plaque psoriasis. Indian J Dermatol 2011;56:520-6
16. Brauchli YB, Jick SS, Meier CR. Psoriasis and the risk of incident diabetes mellitus: a population-based study. British Journal of Dermatology 2008;159:1331-7.
17. Jonathan Shapiro. The association between psoriasis, diabetes mellitus, and atherosclerosis in Israel: A case-control study. J Am Acad Dermatol 2007;56:629-34.
18. Amany Z. El-Ramly. Psoriasis and Insulin Resistance. Med. J. Cairo Univ.2010;78(1):565-71.
19. Boehncke S. Psoriasis patients show signs of insulin resistance. British Journal of Dermatology 2007;157:1249-51.

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20. Ucak S, Ekmekci Tr, Basat O, Koslu A, Altuntas Y. Comparison of various insulin sensivity indices in psoriatic Patients and their relationship with type of psoriasis. JEADV 2006;20:517-22.
21. Karadag, AS. Is psoriasis a pre-atherosclerotic disease? Increased insulin resistance and impaired endothelial function in patients with psoriasis. International Journal of Dermatology,49:642-6.
22. Nabai L, Ebrahimzadeh Ardakani M, Shahidi Dadras M, Nasiri S. Frequency of diabetes mellitus in patients with skin tags. Iranian Journal of Dermatology 2007;10(39).

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