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Report

Prevalence of vitiligo among type 2 diabetic patients in an Iranian population

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Abstract

Background Vitiligo is one of many diseases that can be found with diabetes mellitus. Diabetic patients have a high incidence of vitiligo compared to the general population. This study assesses prevalence of vitiligo in type 2 diabetic patients in Iran.

Methods One thousand one hundred type 2 diabetic patients and 1100 healthy adults were recruited in this cross-sectional study. Patients were evaluated for vitiligo by a dermatologist both clinically and by Wood's lamp. Data were analyzed using SPSS. *P* value 0.05 was considered statistically significant.

Results There was a significant difference between groups with respect to presence of vitiligo; 4.9% of diabetic patients had vitiligo versus 1.8% of control group ($P = 0.001$). In the female group with diabetes, 5.8% had vitiligo, and in male diabetic patients, 3.9% had vitiligo ($P = 0.057$). In the control group, 1.8% of females and 1.8% of males had vitiligo that was equal.

Conclusion Vitiligo and diabetes may have a causal relationship. Vitiligo may coexist with type 2 diabetes. Therefore it is reasonable to investigate each patient periodically.

Introduction

Diabetes mellitus is the most common endocrine disorder, and it is estimated that it will affect 300 million people worldwide by 2025.[1] Variation of insulin level and hyperglycemia lead to involvement of multiple organ systems, including cardiovascular, renal, nervous system, eyes, and skin. Diabetes mellitus is associated with many skin diseases, one of which is vitiligo.[2] Vitiligo is an acquired disorder of melanocytes that causes depigmentation macules in normal skin. Increased frequencies of other autoimmune disorders, such as type 1 diabetes mellitus, have been detected in patients with vitiligo.[3]

Ortonne et al. were the first to mention the association between diabetes and vitiligo, and they attributed the skin discoloration to some pancreatic influence.[4] In most studies, many cases of diabetes with vitiligo have been published.[5,6] Dawber suggested that diabetes mellitus should be excluded in all cases of late-onset vitiligo.[7]

In a study in Karachi, 10% of 100 patients with diabetes mellitus had vitiligo compared with an incidence of 1% in the general population.[8] This study assessed the prevalence of vitiligo in diabetic patients in Iran.

Materials and methods

A total of 1100 type 2 diabetic patients (589 female, 511 male) and 1100 healthy adult volunteers (609 female, 491 male) were recruited in this cross-sectional study that was conducted in a diabetes clinic in Yazd (central province of Iran) over a 6-month period in 2011. The age of the patients ranged from 16 to 95 years, and 10 to 98 years in control and case groups, respectively. All diabetic patients were diagnosed by laboratory tests for diabetes and were under follow-up. Patients were evaluated for vitiligo by a dermatologist both clinically and by Wood's lamp. Data including age and sex were collected.

Data were analyzed using SPSS software (version 16.0; SPSS, Chicago, USA). Comparisons between patients and controls were performed by chi-square analysis for qualitative variables. A value of $P \leq 0.05$ was considered statistically significant.

Results

There was a significant difference between groups with respect to the presence of vitiligo (Table 1); 4.9% of diabetic patients had vitiligo vs 1.8% of the control group

Table 1 Frequency of vitiligo among diabetic and healthy persons

Vitiligo Group	Present *n* (%)	Absent *n* (%)	*P*-value
Diabetic	54 (4.9)	1046 (95.1)	0.001
Healthy	20 (1.8)	1080 (98.2)	

Table 2 Distribution of patients with vitiligo by sex

Group Sex	Diabetic *n* (%)	Healthy *n* (%)	*P*-value
Male	20 (37)	9 (45)	0.04
Female	34 (63)	11 (55)	0.001
F : M ratio	1:7	1:2	0.01

($P = 0.001$). Table 2 represents the distribution of patients with vitiligo in both diabetic patients and the healthy group according to sex. In diabetic patients with vitiligo, 63% were female and 37% were male (female to male ratio = 1:7). In healthy persons with vitiligo, 55% were female and 45% were male (female to male ratio = 1:2). In the female group with diabetes, 5.8% had vitiligo, and in male diabetic patients, 3.9% had vitiligo ($P = 0.057$). In the control group, 1.8% of females and 1.8% of males had vitiligo.

There was a significant difference between the females of both groups (diabetic and non-diabetic) with respect to vitiligo ($P = 0.001$). Also, there was a significant difference between the males of both groups with respect to vitiligo ($P = 0.04$).

Discussion

This study showed that 4.9% of type 2 diabetic patients had vitiligo. In the study done by Esfandiarpour and Farajzadeh in Iran, the prevalence of vitiligo was 1.8%.[9] In a survey done by Pezeshkpoor *et al.*, 4.2% of type 2 diabetic patients were affected with vitiligo.[10] Similarly, the overall prevalence of vitiligo has been estimated to be 0.6% in the general population of Iran.[11] So, our results show that vitiligo is more prevalent in type 2 diabetic patients compared with the general population. Also, there is no sex difference in the prevalence of vitiligo between diabetic patients and healthy persons.

The female to male ratio in diabetic patients with vitiligo is 1:7. This is in agreement with previous studies in Iran; for instance, in the study by Esfandiarpour *et al.*, in patients with early-onset disease, the frequency was higher in females compared with males (female to male ratio = 1:8).[9] This difference might be attributed to the sampling bias, which happens in most household surveys in Iran, because most of participants in such studies are those who are working at home during the day, and mostly they are housewives.

Vitiligo is an autoimmune disorder that causes loss of melanocytes from involved areas. It occurs with a frequency of 0.1–2.0% in various populations.[3] In research performed by Vijayasingam *et al.* in Singapore on 100 diabetic patients, the prevalence of vitiligo in type 2 diabetic patients was 3.3%.[12] In a study performed in 2009 in Pakistan, among 350 diabetic patients enrolled in the study (including 320 type 2 diabetics), 5.7% had vitiligo.[13] In other research performed in 2010 by Goyal *et al.*, 100 diabetics were considered for skin manifestations that showed a prevalence of 8% for vitiligo.[14] In the study by Wani *et al.*, among 200 diabetic cases, 136 (68%) patients had some associated cutaneous manifestations, and vitiligo was found in 5.88% of patients.[15]

In a survey of patients with vitiligo, the frequency of vitiligo appeared approximately equal in males and females.[3] However, in our study, vitiligo occurred in 1.8% of the general population, with the same proportion in healthy males and females.

The prevalence of vitiligo in diabetic patients in this study was 4.9%, which is higher than in the control group. This result is in agreement with another study in Iran that showed a prevalence of 4.3% in this population.[10] In that study, the prevalence of vitiligo in female and male diabetics was 5% and 3.3%, respectively. Although our results showed a higher prevalence of vitiligo in female diabetics than in male diabetics, it was not statistically significant.

In another series in Karachi, 10% of 100 patients with diabetes mellitus had vitiligo compared with 1% in the general population.[8] In another report, among 457 diabetic subjects attending an outpatient clinic, 9% had vitiligo lesions.[16]

Somorin and Krahn also found vitiligo to be associated with diabetes mellitus in 5% of cases, mostly in the form of type 2 diabetes.[17] In some other studies, a high prevalence of systemic complications has been reported in diabetic patients with cutaneous involvement compared with diabetics without cutaneous manifestations.[18,19]

It is known that abnormal carbohydrate metabolism, atherosclerosis, microangiopathy, neuron degeneration, and impaired host mechanism all play roles in the pathogenesis of cutaneous complications.[12] Although the relation between type 1 diabetes and vitiligo has been previously established, our study showed a high prevalence of vitiligo in type 2 diabetes. Multiple pathogenesis mechanisms may be involved in the appearance of vitiligo in type 2 diabetes. Vascular and non-vascular pathogenesis mechanisms play a role in diabetic complications. The increase of oxidative stress, free radical, and various

growth factors may have a cytotoxic effect on melanocytes.

Our study confirmed some of the data from previous studies. Vitiligo may coexist with type 2 diabetes. They may also have a causal relationship.[20] Further studies may better clarify this association. Therefore, it is reasonable to investigate each patient periodically.

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