Abstract

Context: Diabetes mellitus is associated with many skin manifestations including vitiligo. Vitiligo occurs more commonly in Type 1 diabetes mellitus. A few recent studies have shown its increased occurrence in Type 2 diabetes mellitus.

Aims: This study aims to study the prevalence of vitiligo in Type 2 diabetic patients and to compare the prevalence of vitiligo in age- and sex-matched group of nondiabetic population.

Settings and Design: The present study was a hospital-based cross-sectional study conducted in the Department of Dermatology in a tertiary care hospital.

Subjects and Methods: Six hundred consecutive consenting patients of Type 2 diabetes were included in the study group and age- and sex-matched controls were healthy nondiabetic adult volunteers attending the Department of Dermatology. Fasting and postprandial blood sugar levels were done. A complete history, physical examination, and wood's lamp examination to detect vitiligo were conducted. In all those with vitiligo, the type of vitiligo was noted.

Statistical Analysis Used: Data were analyzed using SPSS software version 20.0. Comparison between the presence of vitiligo in cases and controls was done using Chi-square test with \( P = 0.05 \) for significance.

Results: Vitiligo was seen in 12% of cases and 6% of control group which was statistically significant \((P < 0.01)\). There was no significant difference between cases and controls with respect to type of vitiligo.

Conclusions: Vitiligo can occur in Type 2 diabetics as seen in our study and few other recent studies. The exact pathogenesis is not very clear and needs further consideration.

Key Words: Cross-sectional study, diabetes mellitus, vitiligo

Introduction

Diabetes mellitus is a metabolic disorder characterized by elevated fasting and postprandial blood glucose levels and a variety of multisystem complications, mainly in the blood vessels, eye, kidney, nervous system, and integument.\(^1\) Diabetes is known to be associated with many skin diseases, and vitiligo is one of the skin manifestations.\(^2\) Vitiligo is an acquired, noncontagious disorder, in which progressive, patchy loss of pigmentation of skin and often overlying hair, and mucous membranes, results from the loss of melanocytes from the involved areas.\(^3\)

Vitiligo is known to occur with many autoimmune diseases, and there are many reports of its association with Type 1 diabetes mellitus unlike its association with Type 2 diabetes mellitus.\(^4,6\) Few studies show the association of vitiligo with Type 2 diabetes.\(^2,4\)

The aim of this study was to study the prevalence of vitiligo in Type 2 diabetic patients and to compare the prevalence of vitiligo in age- and sex-matched group of nondiabetic population.

Subjects and Methods

The present study was a hospital-based cross-sectional study conducted in the Outpatient Department of Dermatology, Rajarajeswari Medical College and Hospital, during April 2014 to September 2015. The Institutional Ethical Committee approval was obtained before the start of the study. Six-hundred consecutive consenting
patients of Type 2 diabetes were included in the study group. The controls were healthy nondiabetic adult volunteers attending the Department of Dermatology. The two groups were age and sex matched. Written informed consent was taken from all the cases and controls.

All the Type 2 diabetic patients were under treatment and follow-up for Type 2 diabetes. Fasting blood sugar and postprandial blood sugar levels were done in both the cases and controls. A complete history, physical examination, and wood's lamp examination to detect vitiligo were conducted in cases and controls. In all those with vitiligo, the type of vitiligo was noted. Patients with gestational diabetes and Type 1 diabetes were excluded from the study.

Data were analyzed using SPSS software version 20.0 (IBM Corp, released 2011, Armonk NY: IBM Corp). Comparison between the presence of vitiligo in case and controls was done using Chi-square test with $P = 0.05$ for significance.

### Results

The mean age of the cases was 55.07 years and of the controls was 48.47 years. Vitiligo was seen in 12% of cases and 6% of control group [Table 1]. Chi-square test of significance was used to test the proportion of cases and controls with respect to vitiligo. There was a significant difference between them ($P < 0.01$). The odds ratio for vitiligo (yes/no) was 2.136.

Among the cases of diabetes with vitiligo, 58.3% were male, and 41.7% were female and among the controls with vitiligo males were 83.3% and females were 16.7%.

Among the cases, 41.7% had localized vitiligo, and 58.3% had generalized vitiligo while in the controls, 55.6% had localized vitiligo and 44.4% had generalized vitiligo [Table 2]. Chi-square test of significance was used to test proportion of cases and controls with respect to type of vitiligo. There was no significant difference between them ($P > 0.05$).

Among the cases, Student's $t$-test was used to test the mean diabetes duration (in years) difference between patients having vitiligo and those not having vitiligo. There is no significant difference in mean diabetes duration between patients having vitiligo (mean = 6.4833) and those not having vitiligo (mean = 6.4364) [Table 3].

### Discussion

Diabetes mellitus is usually complicated by many cutaneous disorders, and it is seen in about 30% of diabetics.[7] Cutaneous manifestations vary in Type 1 and Type 2 diabetes. Type 2 diabetes is often associated with skin infections, and Type 1 is associated with autoimmune-related lesions.[8] In addition, Type 2 diabetes is associated with more complications than Type 1 but the prevalence of cutaneous disorders appears to be the same.[8]

In our study, vitiligo was seen in 12% of Type 2 diabetic patients and in the age- and sex-matched controls, it was 6%. In the study done by Afkhami-Ardekani et al.[9] in Iran, vitiligo was seen in 4.9% of Type 2 diabetics where the prevalence of vitiligo in the general population was 0.6%. In the study by Vijayasingam et al.,[9] the prevalence of vitiligo in similar subjects was 3.3%,[9] and in the study by Mahajan et al. of 100 diabetics with 98% of them being Type 2 diabetics, vitiligo was seen in 4% of the patients, whereas in the age- and sex-matched controls, it was 1%. All these studies are concordant with our study wherein vitiligo was seen in a higher proportion of Type 2 diabetics.

In addition, in the study by Timshina et al., of 224 diabetics among whom 89.7% were of Type 2 diabetes, vitiligo was seen in 4% of patients, and 0.9% of controls. Vitiligo was seen to be associated with both Type 1 and Type 2 diabetes.[8]
Among the Type 2 diabetics having vitiligo in our study, 58.3% were male, and 41.7% were female. There was no statistical difference with the occurrence of vitiligo in males and females. In the controls, vitiligo was seen more commonly in males. In general, vitiligo does occur equally in both the sexes.[11]

Among the cases with vitiligo, 41.7% had localized vitiligo, and 58.3% had generalized vitiligo while in the controls with vitiligo, 55.6% had localized vitiligo and 44.4% had generalized vitiligo. There was no statistical difference in the type of vitiligo in both cases and controls. In general, vitiligo vulgaris is more common than localized vitiligo.[12,13] Our study was done in a tertiary care center, and all the patients and controls were screened for vitiligo so the occurrence of localized vitiligo may be more. In our study, the duration of diabetes was not associated with the occurrence of vitiligo.

In India, the occurrence of vitiligo is higher than in many other countries. It has been seen in 0.25% to 9.982% of the population.[11] This might explain the higher number of vitiligo cases in both cases and controls in our study. In general, vitiligo occurs in 0.1%–0.2% of population.[1]

Melanocyte depletion occurs in vitiligo, but the exact cause is still not very clear.[6] Vitiligo is commonly considered to have an autoimmune basis, and its strongest evidence is its association with many other autoimmune diseases.[14] The presence of vitiligo in Type 1 diabetes may be due to autoimmunity affecting the skin as Type 1 diabetes is known to be a slow autoimmune disease.[6]

In Type 2 diabetes, vitiligo can occur as seen in our study and few other recent studies. Here, the pathogenesis may be varied. It is speculated that the same patient may be predisposed genetically for occurrence of both vitiligo and diabetes. In Type 2 diabetic patients having diabetic neuropathy, neuronal damage can cause depigmentation. In addition, vitiligo and diabetes may have causal relationship. Apoptosis of melanocytes occurs in vitiligo and in diabetes, apoptosis of melanocytes may be because of products of oxidative stress, free radical generation, and release of various growth factors which are cytotoxic to melanocytes.[6]

**Conclusions**

It can be said that vitiligo can coexist with Type 2 diabetes. The exact pathogenesis is not very clear and needs further consideration.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

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**What is new?**

- Vitiligo can occur in Type 2 diabetes mellitus as it occurs in Type 1 diabetes mellitus and the exact pathogenesis is not very clear.

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