Association between Vitiligo and Thyroid Autoimmunity in Jordanian Population

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Abstract

Vitiligo is considered to be the most commonly acquired hypomelanosis. In this study, we investigated some of the issues with regards to Vitiligo and its association with autoimmune thyroiditis. In this case-control study, thyroxine (FT4), triiodothyronine (FT3), and thyroid stimulating hormone (TSH) were measured in 130 patients with vitiligo and in 99 healthy volunteers. Also, we compared the frequency of thyroid autoantibodies (anti-Tg, thyroid peroxidase antibody, and anti-TPO) in the same groups.

Results: Showed that thyroid functional abnormalities were found in 6 (18.18%) patients. Anti-Tg and anti-TPO were positive in 115 (88.5%) patients respectively. In the control group, only nine subjects (9.1%) had abnormalities in thyroid hormonal condition, and two subjects had positive thyroid autoantibodies compared with the control group, and the frequency of both anti-Tg and anti-TPO was significantly higher in those with vitiligo.

Conclusion: This study showed a significant association between vitiligo and thyroid autoimmunity and the tests to detect thyroid autoantibodies that are appropriate in patients with vitiligo.

Keywords: Hypomelanosis; Thyroxine; Autoantibodies; Autoimmunity; Thyroid

Introduction

Vitiligo is considered to be the most commonly acquired hypomelanosis [1]. In this study, we will investigate the association of Vitiligo with Autoimmune Thyroiditis by indicating the epidemiological profile of this skin disease, which will raise the attentiveness of physicians about the need for a more careful assessment of patients with vitiligo and to trace their epidemiological profile in order to estimate the association between vitiligo and thyroid diseases among Jordanian population. Also, in this study, we will compare our results with the current and previous studies conducted in different areas around the world. The other purpose of this investigation was to study the occurrence of concomitant autoimmune diseases in Jordanian patients with generalized or localized vitiligo as well as their families.

Patients and Methods

The study included 130 patients with vitiligo, 71 female and 59 male, with mean age 26.54 (± 14.87) years. Of them, there were 89 (68.9%) patients with generalized vitiligo and 40 (31.1%) with localized form of the disease. A detailed history and examination were conducted for all study subjects, including the patient’s age, age at onset, duration of disease, associated diseases, history of thyroid disorders, and the extent and severity of the disease. The diagnosis of vitiligo was made on clinical grounds according to standard criteria. The control group consisted of 99 volunteers, 20 (20.2%) female, and 79 (79.8%) male, with mean age 27.16 (± 14.41) years. Blood samples were withdrawn in order to estimate the association between vitiligo and thyroid autoimmunity and the tests to detect thyroid autoantibodies that are appropriate in patients with vitiligo.

Statistical comparisons were performed using chi-square test. Data were considered statistically significant at 0.05 levels.
Results

We performed a case control study in 130 consecutive patients with vitiligo and 99 age and sex-matched controls. Demographic data of patients and controls are shown in Table 1. The mean (SD) age of the patients and control groups was 26.54 (± 14.87) and 27.16 (± 14.81) correspondingly. The duration of vitiligo ranged from 1.8 to 139.6 months. Eighty nine patients had generalized, and forty patients had localized vitiligo (Table 2). Thyroid functional abnormalities were found in 115 (88.5%) patients for both anti-Tg and anti-TPO. In the control group, only nine (9.1%) and eleven (11.1%) subject had abnormalities in hormonal status for anti-Tg and anti-TPO, respectively.

| Patient vs. Control | Total | P-value |
|---------------------|-------|---------|
| Patients            | Control |         |
| Female, n (%)       | 71 (54.6%) | 21 (20.2%) | 91 (39.7%) | <0.001 |
| Male, n (%)         | 59 (45.4%) | 79 (79.8%) | 138 (60.3%) |     |
| Age Range, Years    | 4-58 | 2-61 |     | |
| Age, Mean Years ± SD| 26.54 (14.87) | 27.16 (14.81) | 26.81 (14.81) | |

Table 1: Demographic data of patients (Vitiligo group) and (Control group).

| Mean age of onset ± SD (year) | 20.66 ± 15.57 |
| Age of onset range (year)     | 9-53 |
| Mean duration ± (SD) (month)  | 70.53 ± 68.73 |
| Duration Range (month)        | 0.5-252 |

| Type of vitiligo n, (%)            | 89 (68.9) | 40 (31.1) |

Table 2: Clinical characteristics of patients with vitiligo.

| Anti-Tg (threshold value 23 IU/mL) | Anti-TPO (threshold value 25 IU/mL) |
|-----------------------------------|------------------------------------|
| Group | Negative n (%) | Positive n (%) | Negative n (%) | Positive n (%) |
|-------|----------------|---------------|----------------|---------------|
| Vitiligo | 15 (11.5) | 115 (88.5) | 15 (11.5) | 115 (88.5) |
| Control | 90 (90.9) | 9 (9.1) | 88 (88.9) | 11 (11.1) |
| Total | 105 (45.9) | 124 (54.1) | 103 (45.0) | 126 (55.0) |
| χ²,P, df* | χ²=4.19, P=0.040, df=1 | χ²=4.21, P=0.040, df=1 |

Table 3: Frequency of thyroid autoantibodies in the study group; *df=degree of freedom.

A Chi-square test for independence (with Yates Continuity Correction) indicated significant association between higher values of anti-Tg (values more than 23 IU/ml) and vitiligo. A Chi-square test for independence (with Yates Continuity Correction) indicated significant associations between higher values of anti-TPO (values more than 25 IU/ml) and vitiligo.
thyroid autoimmunity markers, such as T3, T4, TSH, anti-Tg, and anti-TPO. Here, our results show that the occurrence of TG-Ab and TPO-Ab was higher in vitiligo patients than in control subjects ($\chi^2=9.4$ and 8.9, $P=0.002$ and 0.003). The TSH levels were significantly higher in the vitiligo patients than in the control subjects ($P=0.045$). The FT3 and FT4 levels were also slightly higher in the vitiligo patients. What is more, patients with positive TG-Ab and TPO-Ab had vitiligo vulgaris. Amongst the 13 vitiligo patients with elevated TSH, 12 (92.3%) were those with vitiligo vulgaris and 1 (7.6%) had segmental vitiligo (Table 1).

### Conclusion

Among the Jordanian vitiligo patients, there is a subgroup with strong evidence of determined susceptibility to not only vitiligo, but also to autoimmune thyroid disease and the presence of TG-Ab and TPO-Ab are the major markers for thyroid autoimmunity. So, by monitoring TG-Ab and TPO-Ab, we can understand the characteristics and extent of AITD [12]. Thus, it seems plausible to screen for thyroid antibodies in vitiligo.

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### Table 4: Comparison of altered thyroid parameters between Vitiligo and control groups

| Group          | Case | Positiv e TG-Ab (%) | Positiv e TPO-Ab (%) | FT3                  | FT4                  | TSH                  |
|----------------|------|---------------------|---------------------|----------------------|----------------------|----------------------|
| Control        | 99   | 98.5**              | 98.5*               | 3.87 ± 0.59          | 1.25 ± 0.21          | 2.61 ± 0.13          |
| Vitiligo       | 130  | 92.3**              | 88.5*               | 6.16 ± 2.81**        | 1.25 ± 0.21          | 7.59 ± 0.99**        |

The occurrence of TG-Ab and TPO-Ab was higher in vitiligo patients than in control subjects ($\chi^2=9.4$ and 8.9, $P=0.002$ and 0.003). The TSH levels were significantly higher in the vitiligo patients than in the control subjects ($P=0.045$). The FT3 and FT4 levels were also slightly higher in the vitiligo patients. What is more, patients with positive TG-Ab and TPO-Ab had vitiligo vulgaris. Amongst the 13 vitiligo patients with elevated TSH, 12 (92.3%) were those with vitiligo vulgaris and 1 (7.6%) had segmental vitiligo (Table 1).