Interplay of IL-17 and IL-2 in immunopathogenesis of vitiligo in Middle Euphrate, Iraq

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Abstract:

Background: Vitiligo is an acquired skin disease described as depigmented macules because of epidermal functional melanocytes.

Aim of study: To identify the relationship between immunological function and vitiligo; level of cytokines (IL-17 and IL-2) were measured in the sera of patients and control.

Material and Methods: Assessment of IL-2 and IL-17 was done by ELISA method and student t-test was used to compare means both groups and P value which was < 0.05 was regarded as significant value from statistical point.

Results: It was shown in this study that the mean IL-17 and IL-2 was significantly increased (0.488±0.12) and (201.55±42.24) in patients with vitiligo in comparison to control patients (0.096±0.024) and (98.11±22.28)(P value <0.05).

Conclusion: It was concluded from this study that both IL-2 and IL-17 have been implicated in vitiligo pathogenesis.

Keywords: Vitiligo, IL-17, IL-2, skin disease, macules, melanocytes

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Introduction

Vitiligo is an acquired skin disease described as depigmented macules because of epidermal functional melanocytes (1). Its constitute 1% of all skin types in the world and most of them below 20 year age (2). In Iraq, the dermatoses frequency had been risen starting with 33.5% during 1987 to 40.9% during 2010 (3) and the pigmentary disorders were found to be the third ranking dermatosis in Baghdad governorate (4). White patches of dissimilar sizes seen on diverse parts of the body at the onset of the disease (5&6) and this is due to reduction of the melanocytes that continued until their complete loss in addition to the disappearance of the melanin granules in the basal and spinous layer keratinocytes (7). This disease has a psychological effect on life with abnormal body image (8). The progress of the disease is random (9&10). In addition to that there are also mixed and undetermined forms of vitiligo (11&12). In some patients the injuries might remain fixed, at further periods vitiligo may develop promptly (13). Most studies had displayed the major role immune system in the vitiligo pathology, and as interleukin are main mediators of immune system there are suggestions that they might participate in the vitiligo pathology (14), so to identify the relationship between immunological function and vitiligo; level of cytokines (IL-17 and IL-2) were measured in the sera of patients and control.

Patients and Methods

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A total number of 38 with clinical diagnosis of generalized vitiligo (cases) who consulted Asthma and Allergy Center/Middle Euphrate from November 2017 to February 2018 in addition to 24 apparently healthy controls were enrolled in this study. Venous blood (5 mls) was aspirated from each patients and control and centrifugation was done to separate serum from blood. Assessment of IL-17 and IL-2 was done by ELISA assay using IL-2 EASIA kit (Mabtech Australia Pty Ltd). IL-2 level was measured in picogram / ml. Serum Il-17 was detected by ELISA technique using human IL-17 ELISA kit (cusabio biotech co., LTD) and IL-17 level was also measured in picogram / ml and the optical density for plate was measured at 450 nm

Statistical Analysis: For statistical purpose SPSS program was used, and t-test was done and P value which been lesser than 0.05 was considered as significant value statistically.

Results:
The result of the current study shows that the IL-2 was significantly increased in patients with generalized vitiligo in comparison to healthy controls (P value < 0.05) (Table 1). Furthermore, the IL-17 was significantly elevated among patients with vitiligo in comparison to that healthy control (P value < 0.05) (Table 2).

<table>
<thead>
<tr>
<th>Testing groups</th>
<th>IL-2 pg/ml</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with generalized vitiligo</td>
<td>201.55</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Healthy control</td>
<td>98.11</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Testing groups</th>
<th>IL-17pg/ml</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with generalized vitiligo</td>
<td>0.488</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Healthy control</td>
<td>0.096</td>
<td></td>
</tr>
</tbody>
</table>

Discussion:
Table -1 showed that there was significant increase in mean IL-2 level among patients with vitiligo in comparison to those apparently healthy control(P value <0.05).This reflect that there was strong immune reaction against melanocyte that lead to their destruction and T cell activation. As cellular proliferation resulted from interaction of IL-2 and its receptor so this type will lead to culmination in the appearance of T cells (effectors) that were obligatory for immuneresponsstotal expression. This study was consistent with other study (18) Table -2 showed that there was significant elevation of IL-17 among patients with vitiligo in comparison to the healthy control (P value < 0.05). It was recently found that a Th17 cells are capable of IL-17 cytokine which found in the epidermis of vitiligo skin when the disease was in active state. Other study showed that the IL-17 cytokine was establishing both epidermis and skin of patients with vitiligo, so this local cytokine production would lead to activation of neutrophils or lymphocytes, and this powerfully concerned in pathogenesis of vitiligo. This is consistent with other studies. It is attractive to suspected that T regulatory cells and Th17 cells occur in anequilibrium at the nonexistence of T-regulatory cells, so the activity of Th17 willaugment inflammatory process in skin of vitiligopatients, so the elevated level of IL-17 found in this study supported the idea that there is fluctuating of the cells of immune response to Th-17 or Th-1 and out from Tregulatory and Th-2 which might culminating in vitiligo appearance.

Conclusions:
1-The significant increase in mean IL-2 level among patients with vitiligo might reflect that there was strong immune reaction against melanocytethat culminate in their destruction and T cell activation

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2- There might be unfavorable effects of IL-17 on melanocyte function and survival.

**Recommendations:**

1- Further studies with larger sample sizes are recommended.

2- Further studies to measure IL-2 and IL-17 gene expression are recommended

**Ethical clearance:** the procedures followed were in accordance with the ethical standards of the responsible committee of ethical committee of Al-Qasim Green University

**Source of funding:** Self

**Conflict of interest:** Nil

**References:**


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