Hematological and Epidemiological Study for Patients Infected With Scabies

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Abstract

The current study conducted 250 clinically suspected cases of scabies infection and 30 cases of healthy patients who attended Al- Hakim Hospital and AL-Zahra Hospital in AL-Najaf province during the period from November 2016 to May 2017. This study is designed to determine the incidence of scabies in suspected clinical cases in the city of Al-Najaf by using a microscopic methods (light and electron) to determine the prevalence of this parasite and to provide an integrated picture of specialists, especially doctors and researchers, on the development of some blood standards in people infected with this parasite so that they can treat their patients.

After the direct microscopy tests for the diagnosis of parasite, the results of infection were 56 (22.4%) respectively, and varied according to gender, males were 34 (13.6%) and females 22(8.8%) respectively. While the number and percentage of infection after testing the technique of PCR were in males 40 (16%) and in females 20 (8%).

The study also examined the effect of some factors on the spread of this parasite, the most important being the education level and the socio-economic status. The number of infection percentage were 30 (50%) and 19 (31.66%) in the case of low socio-economic status and uneducated persons, respectively, while 1 (1.66%) in the good and the people at the university stage respectively.

The total number of white blood cells was significantly higher (P <0.05) in males and females compared to control group due to the increase in the percentage of neutrophil and eosinophil, while the results showed no change in monocyte, lymphocytes and Basophil cells.

The current study shown that the blood parameters of hemoglobin levels and packed cell volume were significant decreased (P<0.05) in Sarcoptes scabiei patients in compared to control group. Whereas red blood cells count was non-significant (P > 0.05) in S. scabiei patients compared to control group.

We concluded from the current study that the infection of scabies influences on the some blood parameters such as PCV, hemoglobin and total and differential leukocytes in patients infected with scabies.

Keyword: Scabies, PCV, Najaf, Leukocyte.

INTRODUCTION

Sarcoptes scabiei is important obligate ectoparasites that lives and reproduces in the epidermis of skin for human and many mammalian hosts and causing scabies disease which lead to significant human and animal morbidity and mortality (Larry et al., 2016).

Secondary infection may be occurring by scabies disease due to Staphylococcus pyogenes and Staphylococcus aureus therefore scabies disease should not be neglected because it is quite high pathogenicity, the have many clinical manifestation such as irritation, redness of the skin, itching and hypersensitivity reactions and these not appear after 4-8 weeks. The incidence of scabies influences by many factors such as low personal hygiene, low socioeconomic, unhygienic circumstances, reduced ventilation ,dirty environment and very high density(Mika et al., 2012; Engelman et al., 2013; Yahmi et al., 2016).

Even though seen of mites may not be easy the diagnosis of S. scabiei depend on the microscopic demonstration of mites and their eggs on skin scrapings (Ghubash, 2006; Janina et al., 2016). Morphological identification is not suitable for diagnosis of Sarcoptes mites due to its small sized configuration (<0.4mm) and restricted morphological differences,PCR is a main and accurate diagnosis method used in detection of parasites due to its sensitivity allows enzymatic amplification of gene fragments from small quantities of parasite material, which used for isolation, analysis of whole parasite genomes, identification of disease, host–parasite interactions and immunology (Walton, 2004 ; Shumaila et al., 2013).

MATERIAL AND METHODS

Detection of Sarcoptes scabiei by light and electron microscope

Surgical needle was using to open a burrow with a straight cutting and then scrapped longitudinally with a sharp border of a lancet. The material thus obtained was mounted on a glass slide with a drop of mounted media (KOH + Glycerin 1:1) and examined under low power microscope (Samina et al., 2016)

Blood Specimens collection

Five ml was the total blood collected from each clinical suspected person with S. scabiei infection and healthy persons as control group by disposable syringe, 4.5 ml of blood kept at room temperature for 30 minutes. The blood samples have been centrifuged at 3000 rpm for 5 minutes to isolated of serum and have been collected in other sterile tubes, each sample of serum was distributed into sex parts; each of them was kept in deep freeze at -20°C until used for serological test and other part of blood 0.5 ml from each of blood samples were drawn in EDTA tubes for Haematological Assessments. From each patient the scraping skin sample which used to DNA extraction for molecular study.

Hematological Methodology

Procedure

Differential count was performed by using CYANHemato analyzer (automatic hematology analyzer. Catalog No.CY006, Diagnostic, Langdorpseteenweg 160, B-3201 Belgium).
RESULTS
Incidence and detection of Sarcoptes scabiei
The parasite was identified after examinations of the scraping skin specimens by using light and electron microscopic method, the number and percentage were fifty six 56 (22.4 %) receptively, 34 (13.6%) male and 22 (8.8%) female, as revealed in table (1), patients were infested by distinguishing ova, larva and adult of Sarcoptes scabiei as seen in figures (1), (2) and (3).

Table 1: Incidence of Sarcoptes scabiei among suspected patients.

<table>
<thead>
<tr>
<th>Method</th>
<th>Patient population</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light and electron microscope</td>
<td>male</td>
<td>150</td>
<td>34</td>
<td>116</td>
<td>46.4</td>
</tr>
<tr>
<td></td>
<td>female</td>
<td>100</td>
<td>22</td>
<td>78</td>
<td>31.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>250</td>
<td>56</td>
<td>194</td>
<td>77.6</td>
</tr>
</tbody>
</table>

Socio-Economic status and Education level
The results of the current study shown the occurrence of S. scabiei infestation was the highest in the Illiterate persons who had the number and percentage of 30 and 50% respectively. Followed by low standard of living 19 and 31.66 % respectively. Then persons who had school education 5 and 8.33% respectively, and at intermediate level was 4 and 6.66% respectively, and the lowest incidence of infection was in person who have high school and college education and good Socio-economic status that were equal in percentage rate 1 and 1.66 % respectively, as seen in Tables (2) and (3).

Table 2: The relationship between Education Level and Infestation with Sarcoptes scabiei.

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Positive cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>High School and College</td>
<td>1</td>
</tr>
<tr>
<td>Primary Schools</td>
<td>5</td>
</tr>
<tr>
<td>Illiterate</td>
<td>30*</td>
</tr>
</tbody>
</table>

*The highest infestation with Sarcoptes scabiei.

Table (3): The relationship between the Socio-economic Status and Infestation with Sarcoptes scabiei.

<table>
<thead>
<tr>
<th>Standard of living</th>
<th>Positive cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>Good</td>
<td>1</td>
</tr>
<tr>
<td>Intermediate</td>
<td>4</td>
</tr>
<tr>
<td>Low</td>
<td>19*</td>
</tr>
</tbody>
</table>

* The highest infestation with Sarcoptes scabiei.

Blood parameters
The results of the current study revealed no differences in red blood cells count in male and female infestation with S. scabiei compared to the healthy group, whereas a significant decrease (P < 0.05) in the concentration of hemoglobin and packed cell volume in male and female infestation with S. scabiei compared to the healthy group as shown in Table (4).

Table 4: Comparison between Blood Parameters in Patients infestation with Sarcoptes scabiei and Control Group.

<table>
<thead>
<tr>
<th>Blood parameters</th>
<th>Patients male (n=28)</th>
<th>Control group of male (n=14)</th>
<th>Patients female (n=16)</th>
<th>Control group of female (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCV (%)</td>
<td>30.806 ± 0.715*</td>
<td>38.838 ± 0.049</td>
<td>32.839 ± 0.073*</td>
<td>39.979 ± 0.198</td>
</tr>
<tr>
<td>Hb g/dL of blood</td>
<td>8.978 ± 0.142*</td>
<td>14.021 ± 0.030</td>
<td>9.041 ± 0.0802*</td>
<td>14.021 ± 0.304</td>
</tr>
<tr>
<td>RBCs X10⁶/mm³</td>
<td>4.631 ± 0.083</td>
<td>5.098 ± 0.092</td>
<td>4.737 ± 0.082</td>
<td>5.098 ± 0.190</td>
</tr>
</tbody>
</table>

* Significant difference P<0.05 between patients and control group.
Leukocyte Count

**Differential Leukocytes Percentage %**
The result of differential type of leukocytes identified significant increase ($P < 0.05$) in neutrophil and eosinophil in patients suffering from *S. scabiei* compared to control group, whereas non-significant ($P > 0.05$) change in the number of lymphocyte, monocyte and basophil in patients group compared to control group, as seen in Table (5).

**Total Leukocyte Count ($10^3 / mm^3$)**
The result of study revealed significant increase ($P < 0.05$) in TLC in patients infected with *S. scabiei* parasite compared to the control group, as shown in table 4.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients male (n=28)</th>
<th>Control group of male (n=14)</th>
<th>Patients female (n=16)</th>
<th>Control of female group (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basophil %</td>
<td>1.132 ± 0.091</td>
<td>1.091 ± 0.091</td>
<td>1.132 ± 0.067</td>
<td>1.091 ± 0.073</td>
</tr>
<tr>
<td>Neutrophil %</td>
<td>54.681 ± 0.041</td>
<td>52.071 ± 0.019</td>
<td>54.891 ± 0.185</td>
<td>52.191 ± 0.19</td>
</tr>
<tr>
<td>Eosinophil %</td>
<td>4.024 ± 0.170</td>
<td>3.087 ± 0.065</td>
<td>4.090 ± 0.017</td>
<td>3.074 ± 0.051</td>
</tr>
<tr>
<td>Monocyte %</td>
<td>6.920 ± 0.196</td>
<td>8.954 ± 0.102</td>
<td>6.901 ± 0.132</td>
<td>8.954 ± 0.102</td>
</tr>
<tr>
<td>Lymphocyte %</td>
<td>33.081 ± 0.074</td>
<td>33.926 ± 0.074</td>
<td>35.026 ± 0.077</td>
<td>33.926 ± 0.074</td>
</tr>
<tr>
<td>TLC ($10^3 / mm^3$)</td>
<td>7.988 ± 0.302</td>
<td>5.954 ± 0.411</td>
<td>6.211 ± 0.176</td>
<td>5.954 ± 0.411</td>
</tr>
</tbody>
</table>

* Significant difference $P < 0.05$ between patients and control group

**DISCUSSION**

The present study revealed that relationship between the socio-economic factor and education level of patient with scabies infestation may be due to malnutrition and low levels of public health sanitation with (Stanton et al., 1987; Green, 1989; Heukelbach and Feldmeier, 2006; Zeba et al., 2014). The present study agreed with study of Samina et al., (2016) who recorded that scabies was more prevalent among lower and middle socio-economic classes as compared to upper classes which are in line noticed that more than 70% of their patients belonging to low socio-economic group. Also Feldmeier and Heukelbach (2009) and Ursani and Baloch (2009) recorded that illiteracy and low standard of education are the factor responsible for the spread of scabies. Some earlier workers (Sachdev et al., 1982; Feldmeier and Heukelbach, 2007; Poudat and Nasirian, 2007; Shah et al., 2010; Onoja, 2013; Zeba et al., 2014) also recognized overcrowding as a prominent feature for the spread of scabies. Studies indicated that more families without scabies owned the house they were living in, had electricity, good sanitary condition, belonged to well-educated families than those who apparently experienced scabies. The results of study have revealed a significant decrease in concentration of Hb and PCV in male and female patients with *Sarcoptes scabiei* infection compared to control group. While non-significantly differences RBCs count in all patients male and female infected with *S. scabiei* in compared with control groups.

**CONCLUSION**

*Sarcoptes scabiei* has an important role in change of some blood parameters levels such as RBCs, PCV, Hb. Total and differential blood leukocytes in patient infested with scabies. Also these results provide the relationship between *S. scabiei* infestation and Socio-economic factor and education level.

**ACKNOWLEDGEMENT**

We are grateful to friendship university of Kufa for providing required facilities.

**CONFLICT OF INTERESTS:**

There are no conflicts of interest.

**REFERENCES**


