Incidence of Larval and Adult Mite (Sarcoptes scabiei) Stages in Scabietic Patients from Three Regions of Qalyobia Governorate

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Abstract:
Human scabies is a highly contagious infestation caused by the itch mite, Sarcoptes scabiei var. hominis. Although it is not a life-threatening condition, yet it may be considered important because some cases may be complicated by post-streptococcal glomerulonephritis. Understanding of the conditions affecting the life cycle of Sarcoptes scabiei is essential for prevention of its transmission in the community. Scrapings from the affected skin were prepared from scabietic patients attending the local pharmacies for buying medicine prescribed by physicians in private clinics, or asking advice from the pharmacist, throughout the months of the year. Statistical analysis of the data revealed a high correlation between the number of patients, and the mean number of adult and larval stages of S. scabiei. In cold months, more patients, mostly children (70%) were infested by a larger number of larvae and adult mites.

Introduction:
Scabies or "the classical itch" caused by the human mite, Sarcoptes scabiei var. hominis is the most common contagious ectoparasitic dermatosis. The parasite was rediscovered and established as the causative agent of scabies in 1687 by Bonomo and Cestoni (a). Although not a life threatening condition, yet it may be considered important from the public health point of view because it is found globally, it causes severe itching which is extremely distressing and some cases may be complicated by post-streptococcal glomerulonephritis. By systematic approach, this condition can be managed appropriately and its transmission can be prevented in the community (b).

Scabies is transmitted by intimate personal contact. The highest prevalence rate may be seen in children, especially below 2 years of age (c). It is truly a disease of poverty. Both sexes are equally involved. The important predisposing factors are overcrowding and poor hygiene. The source of transmission is by close personal contact within the household (d).

The mite can be demonstrated by scraping of papule or a burrow. The scrapings are transferred to a glass slide. Under the light microscope, one may then look for mite, eggs or fecal pellets known as scybala (e).

Thus, scabies which may appear to be an innocuous dermatosis, could prove to be a major burden to public health if not managed adequately (f).

The aim of this work was to study the relationship between the environmental temperature and relative humidity and the epidemiology and mite intensity in residents of three areas of Qalyobia governorate.

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Incidence of Larval and Adult Mite

Patients and methods:

**Patients:**
A total of 386 scabetic patients attending pharmacies in 3 cities of Qualiobia governate for anti-scbiestic medication were followed through-out the months of the year. The number of children under 15 years represented 70% of the patients while only 2% were senile. The sexes were approximately equal.

**Method:**
Mineral oil was placed on a number 15 scalpel blade, which was used to scrape several lesions. The scrapings were transferred to a glass slides. Under the light microscope, the numbers of adult and larval stages of mite per field were recorded. The correlation coefficient of the data were computed.

Results and discussion:
In the present study, 70% of the patients from 3 regions of Qualiobia governate, that seek medication from local pharmacies, were children under 15 years, and 2% were above 50 years old. Kenawi et al (1993) in a study on Qualiobia scabetic patients attending the outpatient clinic of Benha University Hospitals, reported that the number of patients under 25 years represented 43.75%, while 12.5% were above 50. Although their study was also performed on patients from the same governate, the difference in the age distribution is most probably due to sociological behavior of the patients. Mostly, grown up patients attend the outpatient clinic of hospitals while parents take their children to private clinics (whose prescribed drugs are bought from local pharmacies) or pharmacies, where the subjects of the present study were picked up. The present study, however, represents the distribution reported for other parts of the world, in which the highest prevalence rate was reported in children, especially below 2 years of age.

The number of patients was highly correlated (table 2) to the mean number of adult mites (0.995) and to slightly less extent to the mean number of larvae (0.991) per patient. The higher correlation with adults with the number of patients seeking medication is probably due to itching which is due to a type-IV hypersensitivity reaction in the skin caused by the adult mites and their secretions.

The highest number of the mites per patient was recorded during winter and spring months (table 1, Figure 1). During these seasons, the temperature was low (14 – 18°C) and the relative humidity was high (69 – 73%). The correlation coefficient with temperature was, however, higher (0.87 – 0.89) for the number of patients, adult and larval incidence than the relative humidity for which the correlation coefficient ranged from 0.69-0.71. This may be due to three reasons: 1) because of the close contact between individuals especially children of the family in sleeping places during the cold months, 2) because of the high reproducibility of the organism during these seasons, and 3) due to the high survivability of the mite off the host.

It was reported that scabies was more prevailing in pigs during winter and spring. It was also reported that *S.scabiei canis* survived longer at low temperature and high humidity which was also true for *S.scabiei hominis*. This indicates that low temperature and high relative humidity are more favorable for higher biological activity and development of scabietic mites. In addition, high feeding of the adult mite and so, its destructive effects on host tissues were recorded in winter and spring.
The increase in larval population which is highly correlated to the number of adults, patients and climatic conditions (table 2, figure 2) during cold months is definitely due to high hatchability as well as high rates of natality which is associated with the cold temperature, while during hot months high mortality among movable stages decrease the prevalence of the disease. The higher correlation coefficient of the larval stage and temperature, and the slightly less correlation with humidity (table 2) suggests that the hatchability of these mites is more controlled by temperature and less dependent on relative humidity.

From the above study, it seems that human scabies is more prevalent in winter and spring among the inhabitants of Qualiobia governorate. The distribution of patients that seek medication from private clinics and pharmacies represent the internationally reported distribution. Pharmacists, therefore, have to be capable of giving the proper advice to these patients.

References

Incidence of Larval and Adult Mite

J.P.Lippencott, Philadelphia,

Table 1: The number of scabietic patients, number of larvae and adult *Sarcoptes scabii* per patient, Temperature and relative humidity all over the year in Qualyobia governorate.

<table>
<thead>
<tr>
<th>Month</th>
<th>Patients</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larvae/patient</td>
<td>57.0 ± 20</td>
<td>65.0 ± 24</td>
<td>53.3 ± 28</td>
<td>38.6 ± 20</td>
<td>26.3 ± 15</td>
<td>18.3 ± 12</td>
<td>16 ± 11</td>
<td>13 ± 21</td>
<td>18.6 ± 15</td>
<td>21.3 ± 12</td>
<td>26.6 ± 18</td>
<td>49.6</td>
<td></td>
</tr>
<tr>
<td>Adult/patient</td>
<td>72 ± 33</td>
<td>79 ± 36</td>
<td>66 ± 40</td>
<td>48 ± 26</td>
<td>34.6 ± 21</td>
<td>26.6 ± 19</td>
<td>23.6 ± 17</td>
<td>16.3 ± 12</td>
<td>21 ± 20</td>
<td>26.6 ± 19</td>
<td>37.3 ± 24</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Temp. (°C)</td>
<td>14.3 ± 0.2</td>
<td>13.5 ± 0.2</td>
<td>18.0 ± 0.33</td>
<td>20.9 ± 0.15</td>
<td>23.8 ± 0.5</td>
<td>26.1 ± 0.5</td>
<td>29.5 ± 0.55</td>
<td>25.0 ± 0.3</td>
<td>23.5 ± 0.4</td>
<td>21.2 ± 0.45</td>
<td>18.1 ± 0.45</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>Rel. humid.%</td>
<td>69.6 ± 0.12</td>
<td>70.3 ± 0.19</td>
<td>70.3 ± 0.36</td>
<td>64.9 ± 0.57</td>
<td>64.3 ± 0.23</td>
<td>60.4 ± 0.19</td>
<td>62.2 ± 0.45</td>
<td>62.1 ± 0.53</td>
<td>66.7 ± 0.53</td>
<td>69.4 ± 0.25</td>
<td>70.4 ± 0.17</td>
<td>73.4</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: The correlation coefficient between the number of patients, larvae and adult *S. scabii*, temperature and relative humidity all over the year in Qualyobia governorate.

<table>
<thead>
<tr>
<th></th>
<th>Adult</th>
<th>Larvae</th>
<th>Rel.Humid.</th>
<th>Temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>0.995</td>
<td>0.991</td>
<td>0.71</td>
<td>-0.895</td>
</tr>
<tr>
<td>Adult</td>
<td>0.996</td>
<td>0.691</td>
<td>-0.874</td>
<td></td>
</tr>
<tr>
<td>Larvae</td>
<td></td>
<td>0.71</td>
<td>-0.884</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: The number of scabietic patients, number of larvae and adult *Sarcoptes scabii* per patient, Temperature and relative humidity all over the year in Qualyobia.
نسبة تواجد حلم جرب الإنسان بأطواره المختلفة في الأشخاص المرضى به بمحافظة القليوبية

جزاء حسن مرسى
قسم علم الحيوان كلية العلوم جامعة الزقازيق / فرع بنها

تناول هذا البحث دراسة عن مدى انتشار طفل حلم جرب الإنسان (الحيوان البالغ وبرقاته) بين سكان ثلاث مناطق تتم محاولة القليوبية على مدار عام كامل وقدمت هذه الدراسة ضوءاً على مدى وبائية هذا المرض وعلاقته بالمناخ السائد على مدار العام وقد تم متابعة المرضى من المرضى على الصيدليات الموجودة في هذه المناطق سواء من المسنين للدواء بناء على وصفة طبيب في عيادة خاصة أو للحصول على الدواء المناسب من الصيدليات مباشرة. وقد وجد أن الأطفال يمثلون 70% من المرضى وهي النسبة التي أوردها البحث في مناطق أخرى من العالم.

كما سجلت النتائج كثرة عدد المرضى في الحمل ففي الأشهر التي يكون الجو فيها بارداً عنه في أشهر الصيف. كما وجد أن هناك تأثير وتشابه في نسبة تواجد كل من الحلم البالغ وبرقاته حيث وصلت في أشهر الباردة ذروتها بينما تناقصت في الأشهر الحارة من العام. ومن التحليل الإحصائي للنتائج يبدو أن لدرجة الخروج المنخفضة علاقة مباشرة مع مدى تكاثر الطفل وتائره المدمر لاتسعة الجلد أكثر من نسبة الرطوبة المرتفعة.

ويوصى بناء على نتائج هذه الدراسة أن يتم الاهتمام بتوفر التدريب الكافي للصيادلة في مثل هذه المناطق للتعامل مع مرضى الحرم.