

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, through-out 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 glomerulo-nephritis. 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.

Incidence of Larval and Adult Mite

Patients and methods :

Patients:

A total of 386 scabietic patients attending pharmacies in 3 cities of Qualiobia governate for anti-scabietic 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 lesions⁵. 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 govern orate, that seek medication from local pharmacies, were children under 15 years, and 2% were above 50 years old. Kenawi et al (1993)^g, in a study on Qualiobia scabietic 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 govern orate, 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^{6, 8}, in which the highest

prevalence rate was reported in children, especially below 2 years of age^{3,9}

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 secretions².

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^h. It was also reported that *S.scabiei* canis survived longer at low temperature and high humidityⁱ which was also true for *S.scabiei* hominis^j. 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^{13,14}

The increase in larval population which is highly correlated to the number of adults, patients and climatic conditions (table 2, figure2) 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 govern orate. 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

1. Hogan DJ, Schachner L, Tanglertsampam C (1991): Diagnosis and treatment of childhood scabies and pediculosis. *Pediatr Clin North Am*; 38: 941-957.
2. Gibbs S.(2000): Scabies. *Trop Doctor*; 30: 232-235.
3. Meinking Tl, Taplin D (1995):Infestations. In: *Pediatric Dermatology*, 2nd edn. Eds. Schachner LA, Hansen RC. Edinburgh, Churchill Livingstone, pp 1347-1392.
4. Routh HB, Mirensky YM, Parish LC, Witkowski JA(1994): Ectoparasities as sexually transmitted diseases. *Semin Dermatol*; 13: 243-249.
5. Angel TA, Nigro J, Levy ML (2000): Infestations in the pediatric patient. *Pediatr Clin North Am*; 47: 921-935.
6. Rashmi Sarkar, Amrinder J. Kanwar (2001):Three Common Dermatological Disorders in Children (Scabies, Pediculosis and Dermatophytoses) *Indian Pediatrics*; 38: 995-1008
7. Kenawi MZ., Morsy TA, Abdalla KF, Nasr ME, and Awadalla RA (2000): Clinical and parasitological aspects on human scabies in Qualiobia governorate, Egypt. *J. Egypt. Soc. Parasitol.* 23 (1):247 – 253.
8. Bechelli LM, Haddad N, Pimenta WP, Pagnano PM, Melchior E Jr, Fregnan RC, Zanin LC, Arenas A.(1981): Epidemiological survey of skin diseases in schoolchildren living in the Purus Valley (Acre State, Amazonia, Brazil). *Dermatologica*;163(1):78-93
9. Schachner LA, Hansen RG.(1995): Preface. In: *Pediatric Dermatology*, 2nd edn. Eds. Schachner LA, Hansen RC. Edinburgh, Churchill Livingstone, p IX.
10. Davies PR, Moore MJ, Pointon AM.(1991): Seasonality of sarcoptic mange in pigs in South Australia. *Aust Vet J*; 68(12):390-392
11. Arlian LG, Vyszenski-Moher DL, Pole MJ.(1989): Survival of adults and development stages of *Sarcoptes scabiei* var. *canis* when off the host. *Exp Appl Acarol*;6(3):181-187
12. Arlian LG, Runyan RA, Achar S, Estes SA.(1984):Survival and infectivity of *Sarcoptes scabiei* var. *canis* and var. *hominis*. *J Am Acad Dermatol* 1984 Aug;11(2 Pt 1):210-215.
13. ¹Ackerman, A.B., (1977): *Histopathology of human scabies* .In:

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M. Orkin, H.T. Maibach, I.c. Parish and R.M. Schwartzman (Editors), Scabies and Pediculosis. J.P.Lippencott, Philadelphia,

14. ¹ Robinson, R., (1985): Fight the mite and ditch the itch. Parasitol. Today, 1 :140-142

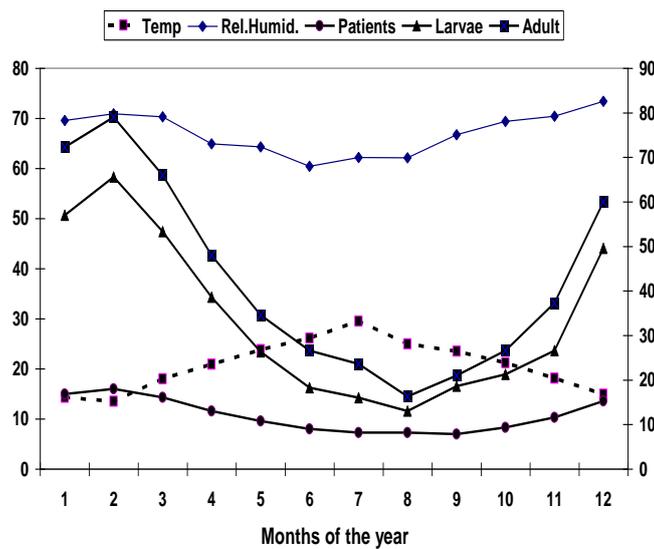
Table 1: The number of scabietic patients, number of larvae and adult *Sarcoptes scabii* per patient, Temperature and relative humidity all over the year in Qalyobia governorate.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Patients	45	48	43	35	29	24	22	22	21	25	31	41
Larvae/patient	57.0 ± 20	65.0± 24	53.3 ± 28	38.6 ± 20	26.3 ± 15	18.3 ± 12	16 ± 12	13 ± 11	18.6 ± 21	21.3 ± 15	26.6 ± 12	49.6 ± 18
Adult/patient	72 ± 33	79 ± 36	66 ± 40	48 ± 26	34.6 ± 21	26.6 ± 19	23.6 ± 17	16.3 ± 12	21 ± 20	26.6 ± 19	37.3 ± 24	60 ± 28
Temp. (°C)	14.3 ±0.2	13.5 ± 0.2	18.0 ±0.33	20.9 ±0.15	23.8 ± 0.5	26.1 ± 0.5	29.5 ±0.55	25.0 ± 0.3	23.5 ± 0.4	21.2 ± 0.3	18.1 ±0.45	14.9 ±0.35
Rel. humid.%	69.6 ±0.12	70.±0. 19	70.3 ±0.36	64.9 ±0.57	64.3 ±0.23	60.4 ±0.19	62.2 ± 0.5	62.1 ±0.45	66.7 ±0.53	69.4 ±0.25	70.4 ±0.17	73.4 ±0.25

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

	Adult	Larvae	Rel.Humid.	Temp.
Patients	0.995	0.991	0.71	-0.895
Adult		0.996	0.691	-0.874
Larvae			0.71	-0.884

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 Qalyobia



نسبة تواجد حلم جرب الإنسان بأطواره المختلفة فى الأشخاص المرضى به بمحافظة القليوبية

جزاء حسن مرسى

قسم علم الحيوان كلية العلوم جامعة الزقازيق / فرع بنها

تناول هذا البحث دراسة عن مدى انتشار طفيل حلم جرب الإنسان (الحيوان البالغ ويرقاته) بين سكان ثلاث مناطق تمثل محافظة القليوبية على مدار عام كامل 0 وقد ألقى البحث ضوءاً على مدى وبائية هذا المرض وعلاقته بالمناخ السائد على مدار العام 0 وقد تم متابعة المرضى من المترددين على الصيدليات الموجودة في هذه المناطق سواء من المشترين للدواء بناء على وصفة طبيب في عيادة خاصة أو للحصول على الدواء المناسب من الصيدلاني مباشرة. وقد وجد أن الأطفال يمثلون 70% من المترددين وهي النسبة التي أوردتها البحوث في مناطق أخرى من العالم.

كما سجلت النتائج كثرة عدد المترددين من حاملتي الطفيل فى الأشهر التي يكون الجو فيها بارداً عنه في أشهر الصيف. كما وجد أن هناك تماثل وتشابه فى نسبة تواجد كلاً من الحلم البالغ ويرقاته حيث وصلت فى الأشهر الباردة ذروتها بينما تناقصت فى الأشهر الحارة من العام . ومن التحليل الإحصائي للنتائج يبدو أن لدرجة الحرارة المنخفضة علاقة مباشرة مع مدى تكاثر الطفيل وتأثيره المدمر لأنسجة الجلد أكثر من نسبة الرطوبة المرتفعة. ويوصى بناء على نتائج هذه الدراسة أن يتم الإهتمام بتوفير التدريب الكافي للصيادلة في مثل هذه المناطق للتعامل مع مرضى الجرب.

