دور البيئة المنزلية والنمط الحياتي في انتشار مرض الجرب في المجتمع الريفي

رسالة مقدمة من

عبد القادر عبد السميع عواد

بكالوريوس الطب والجراحة ـ كلية الطب ـ جامعة القاهرة ـ 1982

لاستكمال متطلبات الحصول على درجة الماجستير

في العلوم البيئية ـ قسم العلوم الطبية

معهد الدراسات والبحوث البيئية

جامعة عين شمس

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استشاري الأمراض الجلدية بمركز المعلومات
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صفحة الموافقة على الرسالة

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وقد تمت مناقشة الرسالة والموافقة عليها

اللجنـة **الإمضـاء**

1- أ.د/ مصطفى حسن رجب .....

أستاذ ورئيس قسم العلوم الطبية معهد الدراسات والبحوث البيئية ـ جامعة عين شمس.

2- أ.د/ محمد صلاح الدين مصطفى .....

استشاري البحوث والإحصاء والمشروعات الطبية

3- أ.د/ مرفت محمد أحمد سويلم .....

رئيس قسم الأمراض الجلدية والتناسلية كلية الطب ـ جامعة الأزهر.

4- أ.د/ أغاريد أحمد الجمال .....

استشاري الأمراض الجلدية بمركز المعلومـات بمستـشفى عـين شـمس التخصصي.

مستخلص الرسالة العربي

الاســـم: عبد الفادر عبد السميع عواد يونس.

العنـوان: دور البيئة المنزلية والنمط الحياتي في انتشار مـرض الجـرب فـي المجتمـع الريفي.

الكليـــة: معهد الدراسات والبحوث البيئية ـ جامعة عين شمس.

التخصص: العلوم الطبية البيئية.

يجب أن يكون مرض الحكة (الجرب) على أولويات مقدمي الرعاية الطبية لأنه مـن الناحية النظرية ـ على الأقل ـ يمكن أن يتم القضاء عليه نهائياً أو تقليل حدوثه إلى نـسب يمكن إهمالها.

وحيث أن مرض الحكة (الجرب) من الأمراض الجلدية المعدية ويتواجد فـي فئـات اجتماعية عديدة ومختلفة في جميع أقطار العالم.. فقد تمت هذه الدراسة لاسـتقراء العوامـل الديموجرافية لانتشاء المرض في منطقة ريفية مصرية.

وانقسمت الدراسة إلى مرحلتين: المرحلة الأولى تم تـسليم كـل مـشارك اسـتبيان لاستقراء التاريخ المرضي والعوامل الديموجرافية المختلفة، وفي المرحلة الثانية تـم فحـص المرض إكلينيكياً ومعملياً لاكتشاف سلوك المرض وطبيعته وكذلك العلاجات المناسبة.

وأسفرت النتائج عن: معدل الإصابة أكثر في الذكور والمجموعـات صـغيرة الـسن والفقراء أكثر من غيرهم، والمرض مرتبط بالعادات غير الصحية والظـروف الاجتماعيـة الغير مناسبة صحياً والأسرة الأكثر ازدحاماً.

وتوصي الرسالة بتصحيح كل هذه الظروف والعوامل المساعدة على انتشار المـرض وعمل فحص دوري في المناطق المزدحمة سكانياً، وصرف العلاج المناسب في حالة اكتشاف الإصابة، كما يجب تصميم برنامج قومي لمكافحة المرض.

Introduction

Scabies is transmissible ectoparasite skin infection characterized by superficial burrows, intense pruritus (itching) and secondary infection. Scabies is ancient affliction estimated to have infected humans for the last 2500 years. The WHO considers scabies to be a water disease because of the connection between bathing and personal hygiene to prevention or control of its spread **(Burgess, 1999).**

It is estimated that there may be $300x10^6$ cases of scabies world wide each year; it is particularly a problem in situations of overcrowding and in less developed countries **(Johnstone and Strong, 2006).**

Sarcoptes scabiei is the organism responsible for the classical form of scabies; typically, it results in a severely itching eruption that does not involve the face or scalp in adults. Itching of the nipples is a characteristic feature in women. In men, itching papules on the scrotum and penis are equally typical **(Goyal and Wong, 2008).**

Transmission: transfer of parasite is by direct contact only (skin to skin) transfer from bed, clothes may occur only if these have been contaminated by infected persons immediately before hand. Scabies can be transmitted sexually **(Johnstone and Strong, 2006).**

Incubation period is (2-6 weeks) before onset of itching in persons without previous exposure. Persons who have been previously infested may develop symptoms almost immediately **(Page et al., 2007).**

Scabies can strike any age or race regardless of personal hygiene; though, personal hygiene can play a role in prevention. It is

more often seen in crowded livening condition. There are an estimated 300 million cases a year; with immunocompromized peoples likely to develop Norwegian (Crusted) scabies **(Burgess, 1999).**

A person can be reinfected with scabies without a host; scabies mites survive for a few days. Therefore, it is recommended after treatment to wash all material (such as clothes and bedding) that has been in prolonged contact with the infested in the last four days **(Walton and Currie, 2007).**

Nocturnal itching is usually the most obvious and intractable manifestation and occasionally may be the only one; it is generally worst at night**.** The disease found world wide and affects people of all socioeconomic level status. Epidemics can arise in areas of poverty, poor sanitation, poor water supply, or overcrowding **(Burgess, 1999).**

Public health and prevention strategies: As access to water effects bathing improves personal hygiene may prevent or control the spread of scabies. Since oral ivermectin may be useful in the treatment, mass distribution programs of Ivermectin to target onchocerciasis may also control scabies **(Walton and Currie, 2007).**

To prevent reinfestation, all social contacts and members of the family, even if not infested, should be treated similarly and most importantly at the same time **(The Merck Manual of Diagnosis and Therapy, 1999).**

Aim of the work:

To illustrate the role of domestic environment and life style in scabies prevalence among rural community aiming at early prevention and control of spread of the disease.

Scabies

Scabies is a common parasitic infection caused by the mite Sarcoptes scabiei. Infestation occurs when the "itch" mite, S. scabiei, burrows into the skin and consumes host epidermis and sera. The predominant disease manifestations are mediated through inflammatory and allergy-like reactions to mite products, leading to intensely pruritic lesions. Scabies is a major global health problem in many indigenous and Third World communities. It causes outbreaks in nursing homes **(Scheinfeld, 2004)** and is recognized in those with human immunodeficiency virus and human T-cell laeukemia virus type 1 infections **(Roberts et al., 2005).**

Scabies is transmitted by skin-to-skin contact, as demonstrated in classical studies by **Mellanby (1941)**, who showed that direct person-to-person body contact was generally necessary for transmission of scabies. Thus, it is a disease of overcrowding and poverty rather than a reflection of poor hygiene **(Heukelbach et al., 2005).**

Scabies is an important disease of children, but it occurs in both sexes, at all ages, in all ethnic groups, and at all socioeconomic levels. Importantly, the associated morbidity is frequently underestimated. In addition to the discomfort caused by the intensely pruritic lesions, infestations often become secondarily infected, especially with group A streptococci and Staphylococcus aureus. Epidemic acute poststreptococcal glomerulonephritis (APSGN) is often associated with endemic scabies in the affected community **(Currie and Carapetis. 2000).**

Despite the availability of chemotherapy, repeated scabies infestations and the resultant recurrent pyoderma have now been

identified as important cofactors in the extreme levels of renal and rheumatic heart disease observed in Aboriginal communities **(White et al., 2001).** Scabies is also a major problem among important livestock and companion animals, with, for example, approximately 25% of pigs in some areas of the United States experiencing scabietic mange, leading to major economic losses **(Pence and Ueckermann, 2002).**

Moreover, many millions of wild animals worldwide suffer from sarcoptic mange. Even though this worldwide disease has been recognized throughout history, in the modern era there have been long interruptions and significant gaps in the research about scabies. Molecular studies of the parasite have been very limited, due to the generally low parasite burden and lack of an in vitro culture system. The first molecular studies of Sarcoptes scabiei var. hominis were enabled via the collection of large numbers of mites from the shed skin of crusted scabies patients in 1997 **(Walton et al., 1997).**

✍ History

Scabies has been known to humankind since ancient times, with Aristotle (384 to 322 BC), the first person believed to have identified scabies mites, describing them as "lice in the flesh" and utilizing the term "akari." Subsequently, scabies has been mentioned by many different writers, including Arabic physician Abu el Hasan Ahmed el Tabari, around 970, Saint Hildegard (1098 to 1179), and the Moorish physician Avenzoar (1091 to 1162) **(Ramos-e-Silva, 1998).**

In 1687, Bonomo and Cestoni accurately described the cause of scabies in a letter **(Montesu and Cottoni, 1991).** Their description recounting the parasitic nature, transmission, possible

cures, and microscopic drawings of the mite and eggs of S. scabiei is believed to be the first mention of the parasitic theory of infectious diseases. Nevertheless, it was not until 1868, 2 centuries later, that the cause of scabies was established with the publication of a treatise by Hebra **(Burgess, 1994).**

Life Cycle

The female mite burrows just under the surface of the skin and lays two to three eggs per day in the stratum corneum for up to 6 weeks at a time, resulting in raised papules on the skin's surface. However, it appears that less than 1% of the laid eggs develop into adult mites **(Mellanby, 1944).**

Developmental instars include egg, larva, protonymph, and tritonymph **(Arlian and Vyszenski-Moher, 1988).**

Adult mites emerge on the surface of the skin after approximately 2 weeks, and after mating, they reinfect the skin of the host or of another human. The male mite is reported to die after mating, although this has been disputed **(Alexander, 1984).**

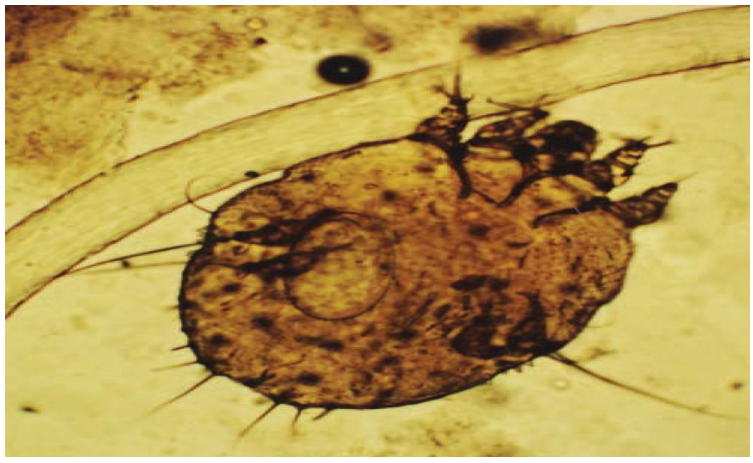

Figure (1): Female scabies mite with egg, taken from skin scraping

(Walton and Currie, 2007).

Morphology

S. scabiei is creamy white with brown sclerotized legs and mouthparts. The adult female is approximately 0.3 to 0.5 mm long by 0.3 mm wide, and the male is slightly smaller, around 0.25 mm long by 0.2 mm wide. Larvae have six legs, and nymphs and adults have eight legs, with stalked pulvilli (suckers) present on legs 1 and 2 of both the male and female adult mites, enabling them to grip the substrate. Additionally, mites bear spur-like claws, and they have six or seven pairs of spinelike projections on their dorsal surfaces. The adult male is distinguishable from the female by its smaller size, darker color, and the presence of stalked pulvilli on leg 4; leg 4 in the adult female ends in long setae **(Walton and Currie, 2007).**

EPIDEMIOLOGY

Scabies is caused by Sarcoptes scabiei var. hominis, an obligate human parasite. The parasite is not a vector of infectious agents. The fertilized female lays two to three eggs daily in tunnels burrowed in the epidermis, which mature to mites seventeen days later. The males die after a short time but the females live for up to six weeks **(McCarthy et al., 2004).**

The numerous mites found in crusted scabies facilitate transmission through the environment and explain why it is highly contagious. Patients with crusted scabies serve as a reservoir for the mite. The crusts flake off and contaminate the environment, and mites survive in the environment for up to three days **(Angel et al., 2000).**

In classic scabies, the environment plays a minor role in transmission; transmission through household contact may result in family clusters **(Chosidow, 2000).**

Canine mites may cause transient infestation of humans that is terminated by animal treatment **(Angel et al., 2000).**

The prevalence of scabies is underestimated, since it is not a notifiable disease in most countries **(Vorou et al., 2007).**

Few studies presenting prevalence data are present in the literature. In Europe, the highest prevalence (4.2%) was noted in a village in Spain **(Reid and Thorne, 1990).**

In the Lower Silesia region of Poland, the prevalence of scabies ranged from 7.9 to 80 per 100 000 people between 1990 and 1997 **(Lonc and Okulewiz, 2000).**

In most European studies, scabies is more frequent among children, young adults, women, family members, and during autumn and winter **(Buczek et al., 2006).**

In many tropical and subtropical areas, such as Africa **(Odueko et al., 2001)**, Egypt (**Hegazy et al., 1999)**, Central and South America **(Heukelbach et al., 2003)**, Northern and Central Australia **(Walton et al., 2004)**, the Caribbean Islands **(Reid et al., 1990)**, India **(Mallik et al., 2004)**, and Southeast Asia **(Pruksachatkunakorn et al., 2003)**, scabies is endemic.

In industrialized countries, scabies is observed primarily in sporadic individual cases and institutional outbreaks **(de Beer et al., 2006).**

Epidemiological studies indicate that the prevalence of scabies is not affected by sex, race, age, or socioeconomic status.

The primary contributing factors in contracting scabies seem to be poverty and overcrowded living conditions **(Walton et al., 2004).**

Notwithstanding this, certain groups are more affected by the disease than others. Scabies is most commonly observed in the very young, followed by older children and young adults. In situations where scabies is endemic, this most likely reflects reduced immunity as well as increased exposure **(Currie and Hengge, 2006).**

Other age groups more commonly affected by scabies infestations include mothers of young children and the elderly in nursing homes. The latter cases are often related to index cases of crusted scabies in combination with compromised immune systems and possibly a decreased ability to kill the mites by scratching due to dementia and/or strokes. Lack of sensitization and/or reduced scratching is also believed to be the reason patients with paralysis or sensory neuropathy can develop localized crusting in affected areas. It has yet to be established whether asymptomatic cases of scabies can occur and whether a history of infection with S. scabiei will cause long-term immunity **(Walton and Currie, 2007).**

In poorly-resourced communities, scabies is frequently associated with superinfection caused by Streptococcus pyogenes or Staphylococcus aureus, which may be associated with increased morbidity and occasionally fatal outcome **(Lawrence et al., 2005).**

Superinfection is also common in patients with acquired immunodeficiency syndrome (AIDS) and homeless people **(Raoult et al., 2001).**

Crusted scabies develops in immunocompromised patients, including patients infected with human immunodeficiency virus

(HIV)/AIDS and/or human T-lymphotropic virus-I (HTLV-I), patients on topical or systemic steroid therapy, organtransplant recipients, leukaemic patients, and elderly institutionalized or debilitated individuals **(Scheinfeld, 2004; Wong et al., 2005).**

Among HIV/AIDS patients, the correlation with scabies is stronger when CD4 counts are low **(Josephine et al., 2006).**

In areas where HTLV-I infection is endemic, crusted scabies constitutes a marker for HTLV-I infection, and adversely, HTLV-I infection affects the clinical course of scabies **(Gotuzzo et al., 2000).**

In immunocompromised patients, crusted scabies may be complicated by staphylococcal sepsis with increased morbidity and mortality. Homeless people frequently seek medical care for dermatological problems, with scabies accounting for a significant proportion. In a study conducted in 1996 in France, 56.5% of 189 homeless people were infested with scabies as a result of poor hygiene, close contact within shelters and deficient medical care **(Raoult et al., 2001).**

When homeless people seek medical care, HCWs should consider the possibility of infestation. Among elderly people, those living in nursing homes are prone to develop scabies **(Tsutsumi et al., 2005).**

Nosocomial scabies is not uncommon. There were nineteen outbreaks identified in 16 hospitals **(Vorou et al., 2007).**

The mean duration was fourteen and half weeks (range 4 - 52 weeks) **(Obasanjo et al., 2001; Larrosa et al., 2003).**

In all outbreaks, the source concerned immunocompromised patients, mainly HIV/AIDS patients or elderly people residin in

institutions, on long-term steroid treatment or with chronic diseases. Most source cases came from the community. All but one had crusted scabies that was unrecognized at admission. Most HIV/AIDS patients were misdiagnosed with seborrhoeic dermatitis or eczema, and scabies was suspected when no response occurred following treatment **(Scalzini et al., 1992).**

In outbreaks where elderly people were the sources of infestation, investigation for scabies began when HCWs developed intense pruritus **(Danchaivijitr et al., 1995).**

The mean number of infested patients per outbreak was eighteen (range 3-82), with a mean attack rate of 12.9% (range 4-40%)**.** The mean number of infested HCWs was thirty nine (range 6-278), with a mean attack rate of 34.6% (range 6.95- 88%) **(Obasanjo et al., 2001)**

Most of the infested HCWs were nurses due to their close contact with patients. In an outbreak that occurred in a large US hospital, risk factors for developing scabies among HCWs were working with AIDS patients and being a nurse, a physical therapist, or an HCW with extensive contact with infected patients. In a nosocomial outbreak that occurred in Brazil, 22.5% of 200 laundry workers were infested because of ignorance regarding preventive measures. All infected HCWs developed classic scabies **(Chan et al., 2000).**

It is noteworthy that 11.1% of 5606 work-related infections reported by HCWs to occupational disease networks in the UK between 2000 and 2003 concerned scabies, second only to diarrhoeal disease **(Turner et al., 2005).**

The unfamiliarity of HCWs with atypical presentations, misdiagnosis of cases, and intensive contact with patients facilitates the transmission of scabies **(Larrosa et al., 2003).**

Within hospitals, the control of scabies outbreaks requires a considerable amount of work. The cost and inconvenience for tracing all contacts is underlined in a large US nosocomial outbreak, where nine hundreds eighty one people received treatment **(Obasanjo et al., 2001).**

The burden is even heavier for poorly-resourced countries with high community prevalence of scabies. Infested asymptomatic HCWs, patients and members of the community may contribute to the spread of infestation throughout hospitals, as occurred in an outbreak where one hundred and twelve people were infested during a 12-month period in three waves; the second and third waves were caused by a treated asymptomatic contact of the previous waves **(Jimenez-Lucho et al., 1995).**

This suggests that therapeutic failures due to resistance or re-infestation may contribute to the prolongation of an outbreak **(Boix et al., 1997).**

Nosocomial outbreaks of scabies are associated with a high economic burden due to additional medications, working hours, prolongation of hospitalization, and ward closures. Estimated costs for the containment of two outbreaks in Canada were Canadian $20 000 and $100 000, respectively, whereas the cost of an outbreak in Brazil was US$ 50 000 Estimations were made in 1992 **(Pasternak et al., 1994).**