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Epidemiology of scabies in the West Bank, Palestinian Territories (Occupied)

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SUMMARY

Background: Scabies is a disease that is considered a public health problem in the Palestinian Territories and in other countries around the world. Scabies causes skin lesions leading to substantial morbidity, and is also associated with social stigma. In this study we describe the epidemiology of scabies in the West Bank, Palestine during the years 2005–2010.
Methods: We examined the records and profiles of a total of 1734 patients who were admitted to the dermatology clinics of the Palestinian Ministry of Health in 2005–2010.
Results: The disease was found to be prevalent in all governorates. The average annual incidence of scabies in the West Bank for 2005–2010 was 17/100 000 population. The average number of scabies patients per year in the West Bank was 26.3 per governorate, with a significant increase in the years 2009 and 2010 ($p < 0.001$). Disease occurrence was significantly higher among children aged ≤10 years than in the other age groups, in adult females in the age groups of 31–40 and 41–50 years compared to males in these age groups, and in males in the age group of 11–20 years compared to females in that age group.
Conclusions: Scabies was found in all governorates of the Palestinian West Bank. Individuals under 20 years of age are particularly at risk. Compulsory reporting of scabies to the Palestinian Ministry of Health would be expected to increase awareness of the disease, which is crucial for the prevention and control of scabies in the Palestinian Territories.

1. Introduction

Scabies is a highly contagious skin disease that is on the increase and afflicts all races and social classes in every nation. The global prevalence has been conservatively estimated at around 300 million cases.[1] This disease is caused by the ectoparasitic mite of mammalian skin, *Sarcoptes scabiei* var. *hominis*. These mites are able to survive away from the host for 24–36 h at 21 °C and 40–80% relative humidity, and remain infective.[2,3] At lower temperatures and higher humidity, these mites are able to remain infective away from the host for about 1 week and are able to penetrate the skin at a temperature above 20 °C.[4]

Although scabies itself is not a fatal or life-threatening condition, it can be severe and persistent, leading to debilitation and discomfort, depression, and secondary skin infections. Affected individuals may be asymptomatic or present varied skin eruptions, including papules, nodules, blisters, and eczematous changes, superimposed with excoriations and bacterial infections. Post-infective complications such as acute post-streptococcal glomerulonephritis are common.[5] The disease is prevalent in all socioeconomic groups and communities throughout the world.[6] Scabies is one of the diseases that carries a high social stigma, such that patients hesitate to seek medical treatment.

The prevalence of scabies varies widely from one country to another.[7] In developing countries the prevalence of the disease is about 5.8–8.3% among rural populations.[8–10] The situation is worsening in underdeveloped countries in Africa, where prevalence ranges from 2% to 31%.[11–14] In the Arab countries like Egypt, the prevalence of the disease is about 2.6%.[15] However, very few studies have been reported from other countries in the Arab World.

The diagnosis of scabies is made by finding a typical scabies burrow in the skin, especially in immunocompromised children and the elderly. Incubation periods, the number of mites carried, and the intensity of the itch are variable. Although the presence of burrows is not always obvious in certain cases, infection of one individual often spreads to all members of the family.[2,16] The occurrence of itchy papules, papular crusts, or vesicular lesions is suggestive of scabies. An individual is diagnosed to have scabies when one or more typical lesions are present and last for longer than 2 weeks, when pruritus intensifies at night, or when at least one other family member has similar lesions.[17] Scabies is not a highly complicated infectious disease; patients can be treated with

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a scabicide such as 5% permethrin.[18,19] Although, scabies has not been reported from the West Bank, Palestinian Territories, a high rate of infection has been reported among school children aged less than 10 years, especially in poor and large families, in Gaza.[20]

Scabies in the Palestinian Territories is not mandated as a reportable disease by the Palestinian Ministry of Health (PMOH). This study was performed to estimate the prevalence of scabies in the Palestinian West Bank by analyzing the available epidemiological data from the PMOH dermatology clinic records, and to determine the possible factors associated with scabies distribution and transmission.

2. Materials and methods

2.1. Study design

A descriptive epidemiological study based on PMOH dermatology clinic records and patient profiles was conducted between 2005 and 2010. One thousand seven hundred and thirty-four scabies patients were recorded by the PMOH directorates in the 11 governorates of the West Bank during the period 2005–2010. Due to changes in the reporting system of the PMOH, only 1241 patient profiles, which included information on age, gender, geographical origin, date of diagnosis, patient profession, and treatment, were available. Cases without a patient profile (total 493) were recorded by the directorates of health as numbers, but without details.

Scabies was diagnosed clinically by the presence of burrows or erythematous papular, vesicular, or pustular lesions with itching. In most cases, the microscopic detection of mites, eggs, or feces was not done. This was not considered a reportable disease by the PMOH, hence some patient records were not available.

2.2. Study area and population

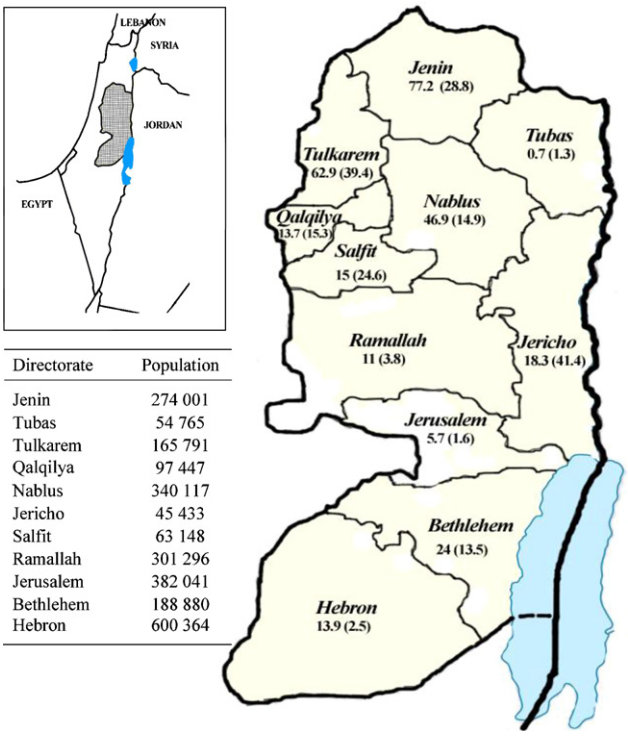
Visits were arranged to all PMOH directorates in all Palestinian governorates in the West Bank, and all scabies records and patient profiles for the period 2005–2010 were inspected and patient information collected. The West Bank is located west of the Jordan River (32 00 N, 35 15 E). It has a land area of 5640 km^2 (including East Jerusalem) and a population of 2 514 845 people (June 2010), as reported by the Palestinian Central Bureau of Statistics (PCBS; http://www.pcbs.gov.ps/). The population is distributed across 11 governorates as follows: Hebron, Bethlehem, Jerusalem, Ramallah, Jericho, Tubas, Salfit, Nablus, Qalqilya, Tulkarem, and Jenin. Figure 1 shows a map of the locations of the study governorates.

2.3. Data analysis

The average annual incidence rates were calculated per 100 000 population for the years 2005–2010 for each governorate. The average number of cases per year was calculated for each governorate, age group, and gender during the study period. The male to female ratio was calculated for each age group and Chi-square statistics were calculated to identify significant differences in disease incidence with regard to the study variables, such as season, gender, and age. Significance was set at the level of ≤ 0.05. Statistical analyses were carried out using the Statistical Package for the Social Sciences SPSS 16.0 (SPSS Inc., Chicago, IL, USA).

2.4. Ethical considerations

The study protocol was revised and approved by the ethical committee of Al-Quds University. Written permission to perform the study was obtained from the PMOH. Prior to study commencement meetings were held with community health authorities and the objectives of the study were explained. All patient records and private data were handled confidentially.



Directorate	Population
Jenin	274 001
Tubas	54 765
Tulkarem	165 791
Qalqilya	97 447
Nablus	340 117
Jericho	45 433
Salfit	63 148
Ramallah	301 296
Jerusalem	382 041
Bethlehem	188 880
Hebron	600 364

Figure 1. Map of the West Bank, Palestinian Territories, showing the average number of patients per year, and in parenthesis the average annual incidence rate of scabies, calculated for each governorate for the years 2005–March 2011. The table indicates the population of each governorate in the middle of the year 2010.

3. Results

One thousand seven hundred and thirty-four patient profiles were investigated in this study. According to PMOH protocols, the diagnosis of scabies should be made by a dermatologist in a dermatology clinic. The clinical diagnosis usually relies on the presence of papules and marks of pruritus on the hands, limbs, and genitalia. In most cases, microscopic detection of mites, eggs, or feces was not done. Patients were treated with 5% permethrin dermal cream. Resistance to treatment with permethrin has not been reported by the PMOH.

The average annual incidence rate of scabies in the West Bank during the period 2005–2010 based on 1734 patients was 17/100 000 population. The average annual incidence rate for the individual governorates ranged from 1.3/100 000 population in Tubas governorate to 41.4/100 000 population in Jericho governorate. In the West Bank the average number of patients per year over the 6-year period was 26.3 per governorate; this ranged from 0.7 in Tubas governorate to 77.2 in Jenin governorate. The average annual incidence rates and the average number of patients per year for each governorate individually are shown in Figure 1. Patient age ranged from 1 month to 93 years, with a median of 21.3 years; mean age was 32.6 years, with a standard deviation of 15.6 years.

The average numbers of patients per governorate in the years 2005, 2006, 2007, and 2008 were 21.4, 15.5, 13.3, and 24.1, respectively, while this almost doubled in the years 2009 and 2010, to 43.4 and 40.1 patients, respectively. The average number of patients was significantly increased in the years 2009 and 2010 compared to the years 2005–2008 ($p < 0.001$) (Table 1). The majority of cases (65%) occurred during the winter time (October–March) and cases declined during the summer time.

Table 1
Numbers of scabies cases in the West Bank per year, 2005–2010

	2005	2006	2007	2008	2009	2010
Total number of patients[a]	235	170	146	265	477	441
Average per governorate	21.4	15.5	13.3	24.1	43.4	40.1

[a] For all 11 governorates, each year.

Table 2
Numbers of patients and percentages of the total cases, by age group and gender

Age (years)	Number of patients	Percentage of the total patients	Male cases (%)	Female cases (%)	*p*-Value[a]
≤10	333	27%	185 (15%)	148 (12%)	>0.05
11–20	259	21%	156 (13%)	103 (8%)	<0.01
21–30	165	13%	96 (8%)	69 (6%)	>0.05
31–40	128	10%	44 (4%)	84 (7%)	<0.01
41–50	167	13%	68 (5%)	99 (8%)	0.01
≥51	189	15%	95 (8%)	94 (8%)	>0.05
Total	1241	100%	644 (52%)	597 (48%)	>0.05

[a] Male vs. female, based on Chi-square statistics; $p \leq 0.05$ was considered significant.

The available patient profiles were checked to determine whether infection with scabies among Palestinians was correlated with gender; 52% of the patients were male and 48% were female (Table 2). The male to female ratio was 1.08. There were no significant differences in disease frequency between males and females when all age groups were analyzed together ($p > 0.05$).

An analysis of scabies infestation across age groups together with gender was conducted; patients were assigned to one of six age groups and the percentage out of the total cases was calculated for each group. Percentages of male and female patients were calculated for each age group to investigate the role of gender and age together (Table 2).

Approximately half of the cases (48%) were under 20 years of age. Disease occurrence was significantly higher among children aged ≤10 years (27%) compared to the other age groups in the study ($p < 0.001$). No significant differences were found between males and females in the age group ≤10 years ($p > 0.05$). Interestingly, scabies incidence was significantly higher in adult females than males in the age groups 31–40 ($p < 0.01$) and 41–50 years ($p = 0.01$), and was significantly higher in males than females in the age group 11–20 years ($p < 0.01$). No gender difference was found for age groups 21–30 years and ≥51 years.

4. Discussion

In this study we described the epidemiology of scabies in the West Bank, Palestine during the years 2005–2010. The disease is prevalent in all age groups and is distributed across all the governorates of the West Bank. A standard diagnosis and treatment protocol is applied by the PMOH. However, the microscopic detection of mites, eggs, or feces was not done for all patients. It is widely known that scabies mimics other skin diseases, hence the detection of mites in all patients should be mandatory. Information on treatment resistance and relapses was not available, thus a better treatment follow-up system should be established. The distribution of scabies throughout the West Bank is uneven, since the average incidence rates varied among governorates, ranging from 1.3/100 000 population in Tubas to 41.4/100 000 population in Jenin, compared to the average across all the governorates in the West Bank of 17/100 000 population. The reason why the Tubas governorate had the lowest average annual incidence rate (1.3/100 000 population) and the lowest average number of patients per year (0.7) for 2005–2010, is that prior to 2008 all patients from this area pertained to the PMOH directorate in Jericho, where diagnosis and treatment were provided. In the year 2008 the PMOH established an independent health directorate in Tubas, and since then all patients have been handled there. Accordingly, Jericho had the highest average annual incidence rate in the West Bank for the years 2005–2010 (41.4/100 000 population); it was previously thought that all the cases originated from Jericho, while in fact they were also from the neighboring Tubas area. Due to the flawed reporting system of scabies by the PMOH clinics, it was not possible to distinguish between cases infected and treated in Jericho and cases infected in Tubas and treated in Jericho, thus a better centralized reporting system is needed to better understand the disease distribution. Moreover, no reports on patients who could have been diagnosed and treated in private clinics were available. It appears that a network reporting system between private clinics and the PMOH for cases of scabies does not exist; this is because the disease itself is not a mandatory reportable disease in the Palestinian Territories.

A significant increase in scabies incidence was noted for the years 2009 and 2010 compared to the years 2005–2008 ($p < 0.001$). This could be the result of an improved recording of patients by the PMOH personnel; however other factors, such as differences in hygiene practices, changes in economic status, or differences in social attitudes, should not be excluded. A seasonality of scabies morbidity was noticed. Sixty-five percent of the patients were reported in the winter (October–March). A probable explanation for this seasonality of disease in the Palestinian Territories is that cold weather may encourage overcrowding and therefore an increase in transmission; this is in agreement with previous reports from other countries.[21–24] Another explanation might considered: cold and humid weather may prolong mite survival.[23] Further research focusing on possible risk factors and the climatic conditions behind the occurrence of scabies in the Palestinian Territories is needed. Better reporting of the disease by the PMOH, together with case–control studies, may lead to the identification of people at high risk of the disease and hence aid in the prevention and control of this disease.

No significant difference was found in the incidence or prevalence of scabies between males and females in this study; this is in agreement with other studies from Denmark,[22] Poland,[10] Brazil,[17] and Egypt.[15] However, studies from Israel[25] and the UK[26–28] have reported higher incidence among females, and a study from Tunisia reported a higher incidence among males.[29] This inconsistency could not be explained and might be attributable to racial factors, as well as private or hidden factors in each society and/or country. Therefore, a global meta-analysis is recommended to better understand the role of gender in scabies prevalence worldwide.

Although males and females in all age groups in the West Bank are vulnerable to scabies, the disease occurrence was found to be relatively higher among individuals aged < 20 years (48%). This result is consistent with other epidemiological reports from other Arab countries like Egypt[15] and Iraq.[30] However a few reports have shown a significantly higher incidence among the elderly.[31] The higher occurrence of scabies among children aged ≤10 years and in women aged 31–50 years (mother or nursemaid age) in the Palestinian Territories may be attributed to the fact that babies and small children are handled by women in this age group. In general, there is closer physical contact between children and women or siblings than between children and adult men. This may lead to different transmission rates between groups of people and explain the variations in incidence by age and gender.[27]

Further investigations on the coincidence of scabies and other dermatological disorders in children and adults, such as impetigo and head lice, is recommended in order to better understand the disease dynamics across the different age groups. Secondary bacterial skin infections should also be considered.

There are several possible sources of bias in the data reported in our study. This study was based on patients handled and treated at PMOH clinics; however data on patients who were treated at private dermatology clinics were not available. Nevertheless, most scabies patients in the West Bank live in low socioeconomic conditions (author's personal observation) and cannot afford the high costs of diagnosis and treatment at a private clinic. Consequently, the majority of the patients seek treatment at the PMOH clinics. Accordingly, the scabies morbidity presented in our study is likely to reflect the true trends.

In conclusion, scabies should be handled as a reportable disease in the Palestinian Territories and the reporting system should be compulsory. This epidemiological study provides a first insight into the scabies infection status in the Palestinian West Bank, Palestinian Territories, based on the examination of patient records available from the PMOH. Prevention and control measures should be directed to increase awareness and better scabies recognition, improve the education of the medical staff at the health units, improve hygiene measures, and implement massive treatment campaigns.

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Conflict of interest: No conflict of interest to declare.

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