Prevalence of Scabies and its Related Risk Factors in Duhok City, Iraq

Original Article

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ABSTRACT

Background: This study aimed to determine the prevalence rate of scabies infestation and its associated risk factors in Duhok City, Iraq. A cross-sectional study was conducted involving 628 patients (317 females and 311 males) with skin lesions who attended the Department of Dermatology at Azadi Teaching Hospital from October 2023 to January 2024.The diagnosis of scabies identified by dermatologists, depends on the presence of skin lesions, itching, and the region of lesions throughout the body. Each patient's entire body was evaluated.The current study reported a high rate of scabies (60.7%) which was higher in females than males across all age groups (≤ one year to ≥ 50 years), and it decreased with the increase of age. The infestation rate was particularly high in October, November, December of 2023, and January of 2024. Several factors associated with the prevalence of scabies including patients' residence (urban or rural) (65.6%, and 34.4%); the duration of itching; the majority of patients experienced itching ≤ 1 month, followed by 1-4 and >4 months (62.7%, 27.3%, and 10.0%) respectively, and the time of itching as follow: at night, during the day, and both at night and during the day (68.2%,23.4% and 8.4%), had contact with animals or not (65.6%, 64.4%). Furthermore, the study indicated that the prevalence rate based on the skin lesion's location through the patient's body as follows: whole body, abdomen, legs, chest, hand, and face (36.0%, 22.7%, 16.9%, 13.0%, 10.1%, and 1.3%) respectively. It is included, that there was a high rate of infestation of scabies in Duhok City, and to eliminate this high rate, it is recommended to improve the methods of prevention and security and supply effective treatment.

Key Words: Duhok, human, prevalence, risk factors, scabies.

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INTRODUCTION

Human scabies is a contagious ectoparasitic infestation of the human skin, affecting people of all ages and sexes[1,2], and is caused by the mite, Sarcoptes scabiei[3]. Sarcoptes scabiei mite is a microscopic ectoparasite under the kingdom Animalia, Phylum Arthropoda, and Class Arachnida, within the super-order Acariforme and the order Astigmata, the super-family Sarcoptoidea, and family Sarcoptidae[4]. Sarcoptes scabiei mite, that parasitizes the skin of humans and animals, and burrow into the epidermis[5]. Scabies are more frequent in humid, tropical climate regions and poor countries[6, 7]. Over 300 million individuals globally suffer from these skin infestations each year[8]. Scabies remains a common public health problem around the world[9].

The disease is transmitted through direct and prolonged contact with infected skin or, rarely, by using contaminated personal objects or sexually[10, 11]. Several factors are related to the transmission of scabies such as migration, healthcare service accessibility, lifestyle, hygienic situation, and population size[12, 13]. Scabies infestation is characterized by skin lesions, that are distributed throughout the body, itching, it is more severe at night than day, presence of lesions on the extremities and trunk, which develop into crusted scabies in immunocompromised patients[9, 14]. an endemic scabies is present with severe itching and has complications, mainly in children[7, 15]. Usually, a diagnosis is determined solely based on clinical characteristics. Scabies should be suspected if several members of the household are itchy. The diagnosis may be more difficult in cases that do not exhibit the usual distribution or look. Tunnel entrances can be verified by applying pen ink over them, as ink follows the tunnel[17]. A skin scraping can be analyzed using light microscopy to provide a definitive diagnosis. A scabies diagnosis can be made by looking for the mite, its eggs, or fecal pellets[18]. The current work was

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undertaken to determine the prevalence rate of scabies and its associated risk factors in Duhok City, Iraq.

MATERIALS AND METHODS

Study design and sampling:

A cross-sectional study was conducted in the present study. 628 patients (317 females and 311 males) with skin lesions of both sexes, who attended the Department of Dermatology at Azadi Teaching Hospital, were involved in this study from October 2023 to January 2024.The diagnosis of scabies identified by dermatologists, depends on the presence of skin lesions, itching, and the region of lesions throughout the body. Each patient's entire body was evaluated.

Statistical analysis:

Statistical analysis was done using SPSS software. The results at *P-value* ≤ 0.05 will be considered significant statistically by using Chi-square test.

RESULTS

Table 1: Shows that the prevalence rate of scabies in Duhok City was 60.7%. It is evident that the overall prevalence rate varied by sex, with a higher rate in females (51.4%) compared to males (48.6%).

Table 1: Positive cases for Scabies among the total No. collected from patients who had skin lesions, who attended the Department of Dermatology at Azadi Teaching Hospital.

Total No.	Positive cases	No. of Male	Positive cases	No. of Female	Positive cases
828	381 (60.7%)	311	185 (48.6$)	317 (51.4%)	196

P value < 0.05, statistically significant at *p- value* ≤ 0.05

Table 2 made it evident that the infestation rate was higher in females than males in the following age groups: under one-year olds (1.0 and 6.4%), those between one and four years old (6.2 and 5.9%), those between fifteen and forty-nine years old (12.1 and 8.0%), and those over fifty years old (0.8% and 1.8%). By contrast, males had a higher infestation rate than females in the five- to fifteen-year-old age group (10.7% and 12.0%, respectively). Lastly, the infestation rate by month was low in December 2023 (12.9%) and equal in November, October 2023, and January 2024 (15.9%), indicating that the virus is everywhere.

Table 2: Reported Scabies by gender and age groups, from October 2023 to January 2024:

Month	< 1 Y		1 - 4 Years		5 - 15 Years		15 - 49 Years		>= 50 Years		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total
Oct.	7	10	21	14	18	24	2	4	0	0	48	52	100 (15.9)
Nov.	0	0	6	9	22	15	17	25	4	2	49	51	100 (15.9)
Dec.	0	0	4	7	18	12	14	22	3	1	39	42	81 (12.9)
Jan.	0	0	6	9	22	15	17	25	4	2	49	51	100 (15.9)
Total	7 (1.0)	10 (6.4)	37 (5.9)	39 (6.2)	80 (12.7)	66 (10.5)	50 (8.0)	76 (12.1)	11 (1.8)	5 (0.8)	185 (48.6)	196 (51.4)	38 1(60.7)

P value < 0.05, statistically significant at *p- value* ≤ 0.05

Table 3 illustrates a relationship between scabies and residence, showing a higher rate of infestation in urban areas (65.6%) compared to rural regions (34.4%). The study also highlights a clear connection between scabies and housing conditions, with the majority of patients experiencing itching for less than one month (62.7%), followed by 1-4 months (27.3%), and more than four months (10%). Additionally, there was a correlation between scabies and the duration of itching: 68.2% of patients reported itching at night, 23.4% during the day, and 8.4% both at night and during the day. These findings suggest an association between scabies and the duration of itching. Furthermore, patients who had direct contact with pets or domestic animals showed a higher prevalence of infestation (65.6%) compared to those without such contact (34.4%), indicating that pets and domestic animals may transmit zoonotic scabies to humans.It was obvious from (Table 4). that the prevalence rate of infestation based on the location of the lesions through the patient's body, as follows: whole body, abdomen, legs, chest, hand, and face (36.0%, 22.7%, 16.9%, 13.0%, 10.1%, and 1.3%) respectively. This means the scabies were distributed throughout the body, as seen in (Figures 1., 2., and 3).

Table 3: Distribution of scabies according to several variables were used in this study:

Variables	Sub-variable	Positive cases	Percentage (%)
Residence	Urban	202	65.6
	Rural	106	34.4
Duration of itching	< 1 months	193	62.7
	1-4 months	84	27.3
	> 4 Months	31	10.0
Time of itching	Night	210	68.2
	Day	72	23.4
	Both (night & day)	26	8.4
Have contact with pet or domestic animals?	Yes	202	65.6
	No	106	34.4

P value = 0.05, statistically significant at *p value* ≤ 0.05

Table 4 clearly shows the prevalence rate of infestation based on the locations of lesions on the patient's body: whole body (36.0%), abdomen (22.7%), legs (16.9%), chest (13.0%), hands (10.1%), and face (1.3%). This indicates that scabies was distributed across the body, as illustrated in Figures 1, 2, and 3.

Table 4: Prevalence of scabies based on the location of the lesion through the patient's body:

Location of lesion/ body	Positive cases	Percentage (%)
Legs	52	16.9
Hand	31	10.1
Face	4	1.3
Abdomen	70	22.7
Chest	40	13.0
Whole body	111	36.0
Total	308	100.0

P value < 0.05, statistically significant at *P value* ≤ 0.05

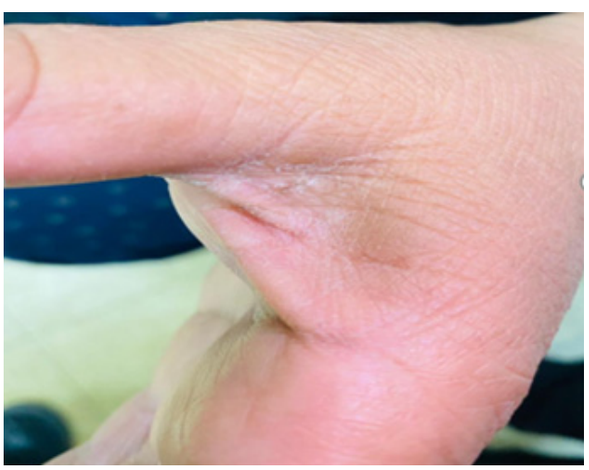

Fig. 1: Lesion of scabies between the fingers of an adult hand.

Fig. 2: Lesions of scabies on the child's hand.

Fig. 3: Lesions of scabies on the child's abdomen.

DISCUSSION

Globally, scabies is considered a neglected skin disease by the World Health Organization and the Technical Advisory Group for Neglected Tropical Diseases[16].

First, the current study reported a high prevalence rate of infestation of scabies (60.7%) in Duhok City. This high rate is in agreement with the result recorded in a study done in Erbil Province, Iraq (52.41%) by ***Ahmed et al.***[17]. This result disagrees with ***Ahmed et al.***[17], who documented a low prevalence rate of scabies infestation in Duhok Province in 2024. In this study, the infestation rate of mange was more prevalent generally according to sex in females (51.4%) than in males (48.6%) in the Province of Duhok. Similar findings have been recorded by other researchers in Duhok Province, Iraq, such as ***Golchai et al.***[18], ***Lassa et al.***[19], Mero and Hassan[20], and ***Sanei-Dehkordi et al.***[21]. On the other hand, this finding disagrees with the findings of other studies, such as Barwari[22], ***Mason et al.***[23], ***Ahmed et al.***[17], who observed that the males were more infested with scabies than the females. However, the prevalence of the infestation in the current study decreased with the increase in age group, and this is consistent with the result of research done in Duhok City by ***Ahmed et al.***[17]. Moreover, Duhok Province observed a high prevalence rate of infestation based on October, November, December, January, and December. This result is the same as the study done in 2024 in Duhok City by ***Ahmed et al.***[17].

Second, the present study found several variables that interact with the rate of infestation of scabies in Duhok City, including first, the relationship between scabies and residence, which was higher in urban areas than in rural areas, and this may be due to poor living style and poor personal hygiene. Because the patients were in urban residences, they found it difficult to access the hospital and get treatment compared to those in rural regions[24]. It is recommended to provide proper treatment for scabies in urban health centers and to give seminars about how scabies are transmitted how to protect themselves from it, and hygiene. Barwary[22], who reported like those we reported in this study. The second connection was between scabies and the duration of itching; most patients had itching less than 1 month, the moderate rate was in 1-4 months, and the lower rate was >4 months. These results were strongly supported by ***Jabbar et al.***[25]. The relationship was between scabies and the time of itching; most patients found had itching at night (68.2%), itching during the day (23.4%), and itching both at night and during the day (8.4%), there is no such study to support these results. The last relationship; was whether the patients had direct contact with pets or domestic animals or not?, and this study found that the more prevalent infestation rate was in those patients who had contact with pets or domestic animals than those who had no contact. This reason is that contact with pets and domestic animals facilitates the spread of scabies to humans. This result agrees with ***Menzano et al.***[26], who approved that the zoonotic mites, Sarcoptes scabiei, can infest humans and cause skin lesions[27].

Third, this study found the prevalence of infestation based on the site of lesions on the body (abdomen, legs, chest, hand, and face), which indicated that scabies lesions may be localized in one region, two, or disturbed through the body, and this is strongly agreed with ***Mero et al.***[20] results, who published the same results on the distribution of scabies through the body.

CONCLUSION AND RECOMMENDATIONS

It is concluded that the prevalence of infestation with scabies in Duhok City, Iraq was high, mainly in females, and the prevalence rate decreased with the increase in age. Also, it was found that Duhok City was prevalent for scabies throughout the year. This study showed that people who lived in urban areas were more susceptible to infestation with scabies than those in rural areas due to contact with animals, a poor lifestyle, and inadequate personal hygiene. It is recommended to decrease this rate of infestation by improved access to healthcare, enhanced hygiene practices, and ongoing research to develop more effective treatments.

CONFLICT OF INTERESTS

There is no conflicts of interest.

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AUTHOR CONTRIBUTIONS

All authors conceived this work and drafted and finalized this study.

ANALYSIS AND INTERPRETATION OF DATA

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ETHICS

The study proposal was approved by the ethics and scientific committee of the College of Health Sciences, University of Duhok, Duhok, Iraq.

DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author.

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انتشار الجرب و العوامل المتعلقة بخطورتها فى مدينة دهوك العراق

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استهدفت هذه الدراسة تحديد مدى انتشار الاصابة بالجرب الجلدى و العوامل المتعلقة بخطورتها فى مدينة دهوك العراق. ٦٢٨ مرضى ممن يعانون من جروح جلدية من كلا الجنسين ممن راجعو قسم الجلدية فى مستشفى ازادى التعليمى تمت ادخالهم فى هذه الدراسة ابتداءا من تشرين ٢٠٢٣ الى كانون الثانى ٢٠٢٤. سجلت الدراسة الحالية نسبة اصابة عالية بالجرب ٦٠,٧٪ و كانت النسبة اعلى بين الاناث من الذكور من جميع مجاميع العمر (≤ سنة الى ≤ ٥٠ سنوات) و تقل النسبة مع تقدم العمر. نسبة الاصابة بالطفيلى كانت عالية فى تشرين الاول, تشرين الثانى ، كانون الاول من سنة ٢٠٢٣ و كانون الثانى سنة ٢٠٢٤. كانت هنالك بعض العوامل تؤثر على نسب الاصابة مثل سكن المريض (مدينة او قرية) (٦٦,٦٪, ٣٤,٤٪) : فترة الحكة حيث ان اكثرية المصابين اشتكو منها ≤ ١ شهر، تلتها ١-٤ و > من ٤ اشهر (٦٢,٧٪، ٢٧,٣٪ و ١٠٪) بالتوالى. و كانت وقت الحكة كالتالى: فى الليل، اثناء النهار و فى الليل و اثناء النهار (٦٨,٢٪، ٢٣,٤٪ و ٨,٤٪)، لديهم اتصال مع الحيوانات ام لا (٦٥,٦٪ و ٦٤,٤٪). كذلك كانت واضحة من هذه الدراسة ان نسبة الاصابة اعتمادا على اماكن الجروح على جلد المريض كالتالى: الجسم كله، البطن، السيقان، الصدر، الايدى و الوجه (٣٦,٠٪، ٢٢,٧٪، ١٦,٩٪، ١٣,٠٪، ١٠,١٪ و ١,٣٪) بالتوالى. و قد لخصت بان هناك نسبة عالية للاصابات فى مدينة دهوك العراق، و لازالة هذه النسبة العالية تمت التوصية على تحسين طرق الوقاية و السيطرة و تزويد العلاج المؤثر من قبل وزارة الصحة.