

Epidemiology and Zoonoses of Seven-Year Disease-Scabies

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Abstract

Scabies is one of the three most common skin disorders. In 2015, it affected about 204 million people. It occurs more commonly in the developing world and tropical climates. The study aims to determine the epidemiology of scabies among man and their animals. Description of zoonotic potential transmission between man and animals. We enrolled 261 Iraqi participants and their animals (if present) who completed the study. An epidemiological and zoonotic study done at Health Care Centers, a period of one year. Scabies diagnosed clinically, and the examination has done accordingly. The association of patient demographics, clinicopathologic factors and disease features described and calculated. The most age found was belonged to the age group 20-40 years in 141(54.02%) patients. The male to female ratio was 1.05:0.95. Scabies mostly described by its itching in whole patients. The duration of the itching lasts for 24 hrs. in 124(47.5) patients, for weeks in 131 (50.19%) patients. Scabies rash presented in most of the patients as 249 (95.4%). Most of the patients 75.47% have their domestic animals or in contact with, either direct or indirect, indoor, farms, and other, with a strongly significant difference among those who haven't ($p=0.035$). By examination of animals of infested patients with scabies, we found about 58.88% of animals were infected with scabies, and these might be acting as zoonotic potential transmission, with significant differences from those peoples who haven't ($p=0.05$). Scabies is one of the three most common skin disorders in the young age group and its frequency is not related to gender. More than three-quarters of peoples in the study have close contact with animals and more of that animals found to be infested with scabies, might be a sort of a zoonotic potential pattern.

Keywords: Scabies; Zoonoses diseases; *Sarcoptes scabiei*; Scraping test; Mites

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Introduction

Scabies is a contagious skin infestation by the mite called *Sarcoptes scabiei* [1,2]. The manifestations are severe itching and a pimple-like rash. The duration of symptoms appearance takes 2-6 weeks. The frequent infestations happen with a day. The itching is become worse mostly at night [2]. The life cycle started when mites burrow into the skin to live and deposit eggs [3]. Crowded living conditions, such as those found in child-care facilities, group homes, and prisons, increase the risk of spread. Different medications are utilized in treating scabies. The treatment should involve the whole household, and any others who have had recent, prolonged contact with the infested individuals [4]. In addition, the controls of itching include antihistamines and anti-inflammatory agents [5]. Bedding, clothing and towels used during the previous days should be washed in hot water and dried in a hot dryer [6]. In 2012, The International Alliance for the Control of Scabies (IACS) was started [7-9]. It worked to manage the global health implications of scabies to the attention of the World Health Organization; the WHO has included scabies on its official list of neglected tropical diseases at same year [7,10].

Sarcoptes scabiei has four pairs of legs and transverse corrugations and bristles on its dorsal aspect. The female mite, just visible to the

human eye, excavates a burrow in the stratum corneum and travels as much as 5 mm every day for 1-2 months before dying. Each female lays a total of 10-38 eggs, which hatch in about one week, reach maturity in about 3 weeks, and start a new cycle. Fewer than 10% of deposited eggs produce adult mites. Most infested adults will harbor 10-12 mites [11]. Scabies might occur in a few domestic and wild animals; the mites that cause these infestations are of different subspecies from the one typically causing the human form [12]. The most frequently diagnosed form of scabies in domestic animals is sarcoptic mange, caused by the subspecies *Sarcoptes scabiei canis*, most commonly in dogs and cats [12]. This subspecies is transmissible to humans who come into prolonged contact with infesting animals and is distinguished from human scabies by its distribution on skin surfaces covered by clothing [13]. Domestic animals that have gone feral and have no veterinary care are frequently afflicted with scabies and a host of other ailments [14].

Methods

Study design and setting

We enrolled 261 Iraqi participants and their animals (if present) who completed the study. Epidemiological and zoonotic study done at Health Care Centers, at period of one year. All patients in this study had positive skin scraping.



Clinically diagnosis

- It is common when diffuse itching present along with either lesions in two typical spots or itching is present in another household member [15,16].
- The classical sign of scabies is the burrow made by a mite within the skin.
- Scratch marks present.
- A definitive diagnosis is made by finding either the scabies mites or their eggs and fecal pellets.
- Samples collected from animals that showed clinical picture and gross lesions such as loss of hair, severe itching, crust and wrinkled skin.
- The wool clipped out with scissors and then drops of glycerin added on the edge of lesion to moisten the area then a skin scraping by a sharp scalpel deeply until blood begins to ooze.
- Scraping distributed on several Petri dishes and all information written on them.
- These samples transported directly to the parasitology laboratory for identification.

Examination

The suspected area is rubbed with a topical tetracycline solution, which glows under a special light. The skin is then wiped with an alcohol pad. If the person is infected with scabies, the characteristic zigzag or S-Shape pattern of the burrow will appear across the skin. The scraping of area done, mounting the sample in potassium hydroxide and examining it under a microscope, or using dermoscopy to examine the skin directly.

Statistical analyses

All analyses were conducted by using SPSS version 15.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The association of patient's demographic, clinico-pathologic factors and disease features described and calculated. A two-sided *P* value of 0.05 or less was considered statistically significant for Fisher's exact chi-square.

Results

The mostly age of the sample studied found was belonged to age group 20-40 years as 141 (54.02%) patients, which was high affinity to infested by scabies with statically significant results ($p=0.04$), with mean \pm SD = 40.2 \pm 11.56 years. Male to female ratio was 1.05:0.95, with no significant difference between two gender. Patients lived rural regions were slightly more than those lived in urban areas. Regarding patients' conditions, the comorbidity and some medication might play roles in epidemiology of scabies. Since, 20 (8.42%) patients with scabies had history of cancer. Patients bedridden presented in 30 (11.49%) strokes' patients, and 14 (5.36%) paraplegic patients. One case of scabies had history of immunocompromised condition. These differences were statistically significant ($p=0.044$). In addition, some drugs may cause deficient in immune system functions as anti-cancer, which recorded in 18 (6.89%) of patients studied. Another group of patients 44(16.85%) kept on different medications. Whereas majority, didn't received any drugs during the period of study. The differences were significant among drugs utilized recorded in the study($p=0.049$), showed in the table (Table 1).

Scabies mostly described by its itching, which all patients suffering from it in this study. Mainly, happen at nighttime in 178 (68.19%), with statistically significant differences among other period of day times ($p=0.001$). The duration of itching last for 24 hrs. in 124 (47.5) patients, for weeks in 131 (50.19%) patients, and lastly 6 (2.29%) patients described itching for months, with significant differences among these durations ($p=0.05$). It presented in all regions of body with no significant difference, showed in the below table (Table 2).

Characteristic scabies rash presented in most of patients as 249(95.4%), with significant difference among those wouldn't have rash ($p=0.01$). 188 (72.03%) of patients described rash for 24 hrs. while 73 (27.96%) patients said, its duration was taken weeks till disappearance, this results have significant differences ($p=0.001$). The sites of rash could be presented everywhere in the body regions, showed in the following table (Table 3).

Most of patients 75.47% have their domestic animals or in contact with, either direct or indirect, indoor, farms, and other, with a strong

Table 1: Study variables distribution ($n=261$).

Variables		n	%	P value
Age	<20	37	14.17	0.04
	20-40	141	54.02	
	>40	83	31.8	
Gender	Male	134	51.33	0.09
	Female	127	48.67	
Residence	Rural	150	57.47	0.057
	Urban	111	42.52	
Comorbidity	Cancer	22	8.42	0.044
	Paraplegias	14	5.36	
	Immunocompromised (HIV disease, organ transplant recipient)	1	0.38	
	Strokes	30	11.49	
	No	194	74.32	
Medications	Chemotherapy	18	6.89	0.049
	Others	44	16.85	
	No	199	76.24	

Table 2: Itching characters of Scabies ($n=261$).

Characters		n	%	P value
Timing	Daytime	30	11.49	0.001
	Night	178	68.19	
	All time	53	20.3	
Duration	24 hrs.	124	47.5	0.05
	Weeks	131	50.19	
	Months	6	2.29	
Sites	Upper limbs	65	10.46	0.77
	Lower limbs	77	29.5	
	Trunk	48	18.39	
	Genitalia	26	9.96	
	Multi-sites	45	17.24	

Table 3: Rash characters of Scabies ($n=261$).

Characters		n	%	P value
Rash	Present	249	95.4	0.01
	Not	12	4.59	
Duration	24 hrs.	188	72.03	0.001
	Weeks	73	27.96	
Sites	Upper limbs	78	29.88	0.052
	Lower limbs	80	30.65	
	Trunk	63	24.13	
	Multi-sites	40	15.32	



significant difference among those haven't ($p=0.035$). By examination of animals of infested patients with scabies, we found about 58.88% of animals were infested with scabies, and these might be act as zoonotic potential transmission, with significant differences from those peoples who haven't ($p=0.05$), showed in the below table (Table 4).

Table 4: Scabies zoonotic relation between man and animals.

Zoonotic relation		n	%	P value
Individuals with scabies have animals (n=261)	Yes	197	75.47	0.035
	No	64	24.52	
Individuals have infested animals with scabies (n=197)	Yes	116	58.88	0.05
	No	81	41.11	

Discussion

Most of the patients belonged to young age. The young and the old are more commonly affected and the elderly, disabled, and people with an impaired immune system, such as HIV, cancer, or those on immunosuppressive medications, are susceptible to crusted scabies (also called Norwegian scabies) [12,17,18].

The main symptom and sign of scabies was the itching, which mainly occurred at night, might be last for one day to several weeks, and distributed over almost all body areas. The rash observed in more than 95% of patients, which mostly stay for one day. The word scabies is from *Latin: scabere*, "to scratch" [19]. The characteristic symptoms of a scabies infection include intense itching and superficial burrows [12]. The burrow tracks are often linear, to the point that a neat "line" of four or more closely placed and equally developed mosquito-like "bites" is almost diagnostic of the disease. Because the host develops the symptoms as a reaction to the mites' presence over time, typically a delay of four to six weeks occurs between the onset of infestation and the onset of itching. Similarly, symptoms often persist for one to several weeks after successful eradication of the mites. As noted, those re-exposed to scabies after successful treatment may exhibit symptoms of the new infestation in a much shorter period-as little as one to four days [20]. In the classic scenario, the itch is made worse by warmth, and is usually experienced as being worse at night, possibly because distractions are fewer [12]. The superficial burrows of scabies usually occur in the area of the finger webs, feet, ventral wrists, elbows, back, buttocks, and external genitals. Except in infants and the immunosuppressed, infection generally does not occur in the skin of the face or scalp. The burrows are created by excavation of the adult mite in the epidermis [12]. In most people, the trails of the burrowing mites are linear or S-shaped tracks in the skin often accompanied by rows of small, pimple-like mosquito or insect bites. These signs are often found in crevices of the body, such as on the webs of fingers and toes, around the genital area, in stomach folds of the skin, and under the breasts of women [21].

More than three quarters of peoples in the study have a close contact with animals either domestic as cows, sheep, dogs, cats, rabbits, chickens, ducks, horse, pigeons and donkey or indoor animals as rats. And more of that animals found to be infested with scabies, but according to CDC, other animals don't spread human scabies [3]. Infestation in other animals is typically caused by slightly different but related mites and is known as sarcoptic mange [22]. In chronically infected animals, the skin changed to be thickened and crusty with asbestoses-like scabs particularly around the eyes and on the ears, snout, hocks, pasterns, crutch and tail. Skin folds developed on thickened skin, which lose its sheen and become discolored by a brownish-grey scruffiness. The hair may become long and curly in some animals and in severe cases, there may be foul odor [23]. *Psoroptes* non burrowing mites which

are parasitic on mammalian skin and live on the body surface and in the ears of susceptible hosts [24]. The skin become thickened, folded, scaly and with crust developed on its surface, may end with bacterial secondary infections [25]. *Chorioptic* scab mite causes *chorioptic* mange in domestic animals especially in cattle, sheep, goats and horses [26]. Based on biological, morphological and molecular genetic studies, two species of *Chorioptes* are recognized; *C.bovis* and *C. texanus* infected cattle, goats, horses, sheep, camels and rabbits.

Conclusion

Scabies is one of the three most common skin disorders in the young age group and its frequency is not related to gender. The mites are distributed around the world and equally infect all races, and socioeconomic classes in different climates. Scabies is more often seen in crowded areas with unhygienic living conditions. More than three-quarters of peoples in the study have close contact with animals and more of that animals found to be infested with scabies, might be a sort of a zoonotic potential pattern.

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