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Original Article

Retrospective analysis of scabies cases admitted to a Turkish hospital according to the citizenship status of the patients

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Abstract

Objective: Political and armed conflicts cause unprecedented mass migrations from conflict areas. Turkey currently hosts the largest refugee population worldwide. Due to overcrowding and unsanitary conditions, scabies is a serious infectious threat for refugees and host communities. This study aimed to analyze the scabies cases in a Turkish hospital with reference to their citizenship status.

Methods: The study retrospectively covered the period of 2013-2018 during a surge of refugee immigration to Turkey.

Results: A total of 2,317 scabies cases were recorded, of which 227 (9.8%) were non-citizens. The number of citizen patients declined by mid-2015, with fewer than ten patients per month for the following 12-month period almost no non-citizen patient presented before and during this period. After mid-2016, however, there was a surge in scabies cases involving non-citizen or citizen patients.

Conclusion: The study revealed a marked, parallel increase in the number of scabies cases in both populations in 2016–2018 after one year of suppression of scabies that had been present in the citizen population but was short of demonstrating a causal relationship between the cases in two populations. Nevertheless, the temporally overlapping surges warrant comprehensive surveillance and appropriate treatment approaches.

***Keywords*:** Immigration, public health, refugees, scabies.

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INTRODUCTION

Scabies is an itchy skin infestation that is caused by an obligate ectoparasitic mite, *Sarcoptes scabiei* var. *hominis* (1). Common dermatological misdiagnoses include papular, irritant, or contact dermatitis and eczema (2), differential diagnosis should include pruritic dermatoses such as eczema, dermatitis, impetigo, insect bites, dermatitis herpetiformis, etc. (1,3). Severe itching and burrowing under the skin are pathognomonic for scabies; the definitive diagnosis is by observing the burrows or the eggs of the parasites (3,4).

The worldwide incidence of scabies was estimated to be about 300 million per year (5,6). Scabies is more common in underdeveloped and developing countries and regions with warmer climates (tropical/subtropical areas) although localized outbreaks might be seen in developed countries (3,6). The prevalence may be as high as 10% in the general population and 60% in children in some economically deprived areas (3). Several previous studies in Turkey have addressed the incidence of scabies in a specific province (7), school (8), nursery (9), or group of patients visiting an outpatient clinic for a different reason and reported the number of patients presenting with scabies in those populations (10,11). However, it is not possible to make a conjecture for the general population since these studies target a specific subset of the community or report only the cases presenting to a healthcare center.

Scabies is transmitted through the contact of the parasite with the skin through prolonged direct personal contact or, although significantly less frequently, indirect contact with fomites (i.e., infected clothes, beddings, etc.) (3,6). However, higher parasite loads due to prolonged infestation or neglect result in higher rates of infection through indirect contact (3,12). Moreover, higher humidity and cooler temperatures extend the infectivity of parasites away from the host body from hours to days (3).

Recent political instabilities and armed conflicts in the Middle East, Southeast Asia, North Africa, and South America resulted in the displacement of more than 68 million people worldwide (13). As Turkey bordered several regional conflicts in recent years and is situated on one of the major immigration routes from these conflict areas and other poverty-stricken countries to Europe, it has experienced an unprecedented influx of refugee immigrants (14,15). With 3.5 million people in 2018, Turkey currently hosts the largest number of refugee immigrants worldwide, mostly from neighboring Syria (16). Although a substantial amount of effort is put into providing immigrants with humane living conditions, the sheer size of the illegal immigration problem and complexities in controlling the movement of people make immigration a major cause for spreading infectious diseases (6,14,17,18). Scabies, an infestation rooted in unsanitary conditions and overcrowding, has frequently come up in the studies addressing the infectious diseases and other health problems facing refugees (6,14,17-19). Indeed, scabies and related itching have been found to be associated with increased secondary infections by other microorganisms (14,20,21).

In this study, it was aimed to retrospectively analyze the scabies cases presenting to a Turkish hospital in reference to the patients' citizenship status. The study covered the period of 2013-2018 when there was a surge of refugee immigration to Turkey and only included the patients diagnosed with and treated for scabies.

MATERIALS AND METHODS

Patients and diagnosis

The medical records of patients who presented to the Hitit University Erol Olçok Training and Research Hospital between January 2013 and April 2018 were retrospectively investigated. Province of Çorum is located approximately 500 km and 800 km from the border to two neighboring conflict areas, Syria and Iraq, respectively (Figure 1). Only the patients diagnosed with and treated for scabies in this period were included in the study. The diagnosis of scabies was based on the criteria of European Guideline for the Management of Scabies: the complaint of severe pruritus that developed in various body regions at night and the appearance of burrows and specific lesions in the dermatological examination, or observing the parasite eggs in the

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microscopic examination (22). The patients who were diagnosed with scabies through verbal complaints only without any clinical findings were excluded from the study. Demographic data about the non-citizens were recorded; patients were categorized as citizens (Turkish citizens) or non-citizens (includes all categories of legal aliens, refugees, asylum seekers, or illegal immigrants). Province-wide data on the non-citizen population were obtained from the governorship of Çorum.

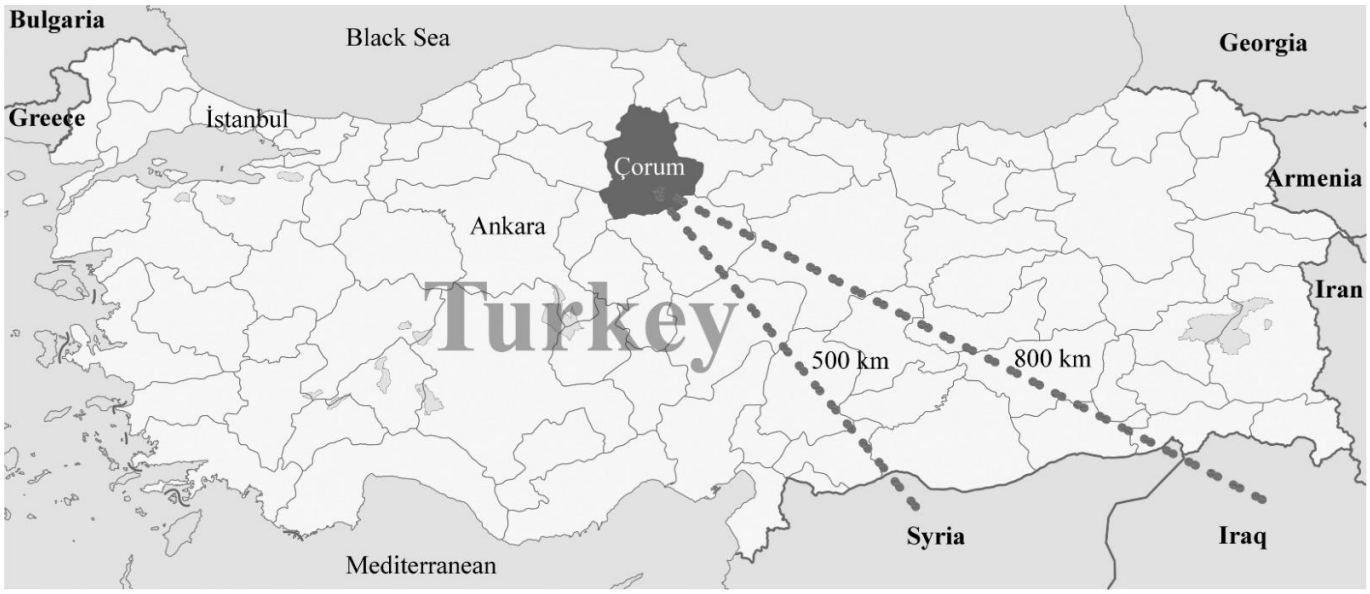

Figure 1. Regional map that shows the location of the province of Çorum and its distance to two conflict areas in the region, Syria and Iraq.

Statistical analysis

Descriptive statistics were given as number and percentage for categorical variables and as the mean ± standard deviation for numerical variables. Pearson's chi-square test was used to evaluate the relationship between categorical variables. Statistical analysis was done using Jamovi (Open source, Version 0.9.2.6, Retrieved from https://www.jamovi.org). The level of significance was set at $p<0.05$.

RESULTS

A total of 2,317 patients presented to the hospital were diagnosed with and treated for scabies in the given period. Demographic data for the whole study group, non-citizens, and citizens and the comparison of non-citizens and citizens were presented in Table 1. Of the patients with scabies, 927 (40.0%) were male, 227 (9.8%) were foreign national, and 500 (21.6%) lived in rural areas. The mean age of these patients was 44.3 ± 24.3 years (median: 44, min: 0, max: 99 years); 417 (18.0%) were under the age of 18, and 562 (24.3%) were older than 65 years. Female gender among the non-citizen patients was less frequent than in the citizens (p=0.001). The distribution of patients' age at admission was given in Figure 2. Non-citizen patients presenting with scabies were significantly younger than the citizen patients (p<0.001).

It was found that the number of patients presenting with scabies was higher in the fall and winter for both the non-citizens and citizens, although a statistical comparison was not made (Table 1). The change in the monthly number of patients presenting with scabies over the period covered by the study was presented in Figure 3. The number of citizen patients has shown a decline through the first half of 2015 with fewer than ten per month for the following the 12-month period after mid-2015 almost no non-citizen scabies case presented to the hospital in question before and during this period. After mid-2016, however, there was a surge in the numbers of both non-citizen and citizen patients presenting with scabies. In this period, the population of non-

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citizens living in the province of Çorum also increased significantly (doubled in 2016 and tripled in 2018) although there was no refugee camp in the province (Table 1).

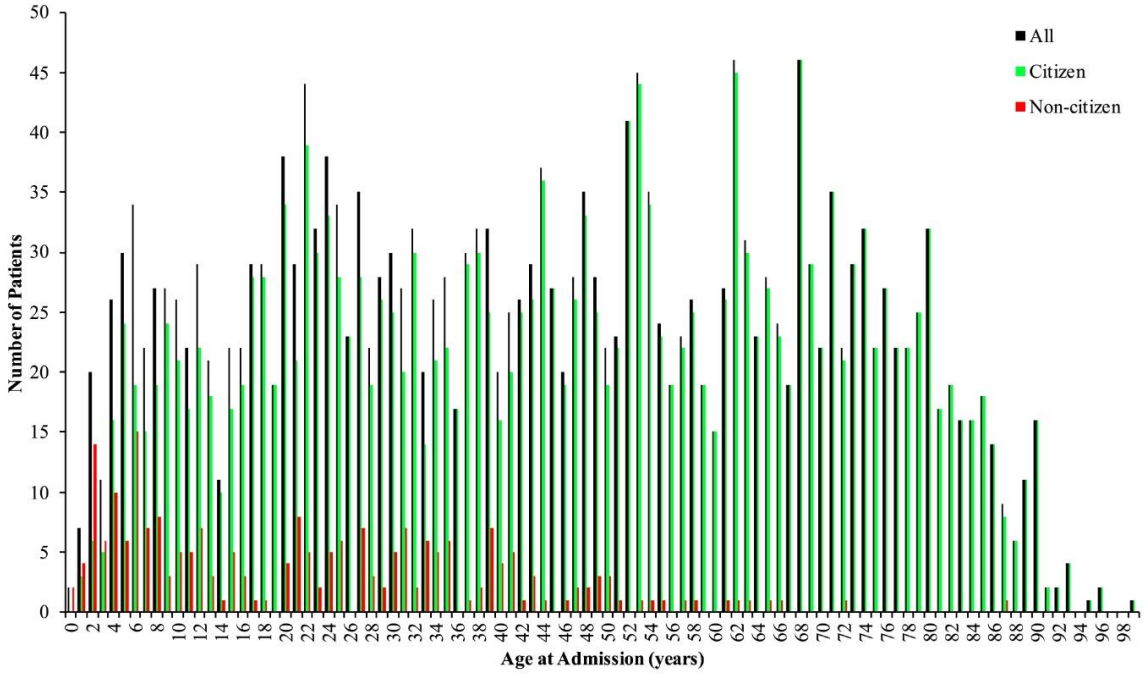

Figure 2. The distribution of patients' age at admission.

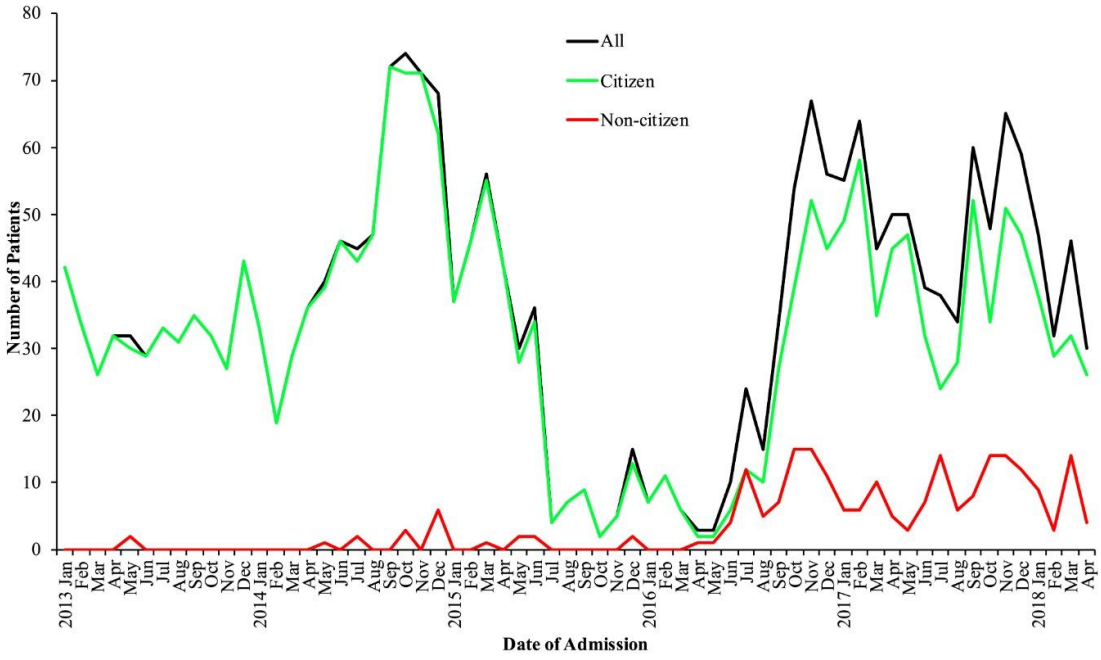

Figure 3. The change in the monthly number of patients presenting with scabies over the years.

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Table 1. Demographic data for all, non-citizen, and citizen patients.

		All	Non-citizen	Citizen	*P*
Population[a]	2013	532,080	1,875 (0.4)[b]	530,205 (99.6)[b]	
n (%)	2014	527,220	3,183 (0.6)[b]	524,027 (99.4)[b]	
	2015	525,180	5,653 (1.1)[b]	519,527 (98.9)[b]	
	2016	527,863	9,762 (1.8)[b]	518,101 (98.2)[b]	
	2017	528,422	11,177 (2.1)[b]	517,245 (97.9)[b]	
	2018	536,483	15,484 (2.9)[b]	520,999 (97.1)[b]	
Patient Count	n (%)	2,317 (100)	227 (9.8)	2,090 (90.2)	
Age	Median [min-max]	44 [0-99]	21 [0-87]	48 [1-99]	**<0.001**[c]
Age Category	<18	417 (18.0)	106 (46.7)	311 (14.9)	**<0.001**[c]
n (%)	19-40	636 (27.4)	87 (38.3)	549 (26.3)	
	41-65	702 (30.3)	31 (13.7)	671 (32.1)	
	>65	562 (24.3)	3 (1.3)	559 (26.7)	
Gender	Female	1,390 (60.0)	113 (49.8)	1,277 (61.1)	**0.001**[c]
n (%)	Male	927 (40.0)	114 (50.2)	813 (38.9)	
Residence	Urban	1,817 (78.4)	187 (82.4)	1,630 (78.0)	0.148
n (%)	Rural	500 (21.6)	40 (17.6)	460 (22.0)	
Season	Spring	556 (24.0)	44 (19.4)	512 (24.5)	
n (%)	Summer	438 (18.9)	52 (22.9)	386 (18.5)	
	Fall	655 (28.3)	76 (33.5)	579 (27.7)	
	Winter	668 (28.8)	55 (24.2)	613 (29.3)	
Scabies cases	2013	396 (17.1)	2 (0.5)[b]	394 (99.5)[b]	
n (%)	2014	580 (25.0)	12 (2.1)[b]	568 (97.9)[b]	
	2015	289 (12.5)	7 (2.4)[b]	282 (97.6)[b]	
	2016	290 (12.5)	71 (24.5)[b]	219 (75.5)[b]	
	2017	607 (26.2)	105 (17.3)[b]	502 (82.7)[b]	
	2018[d]	155 (6.7)	30 (19.4)[b]	125 (80.6)[b]	

SD: standard deviation
[a]The numbers are based on the information provided by the governorship of Çorum and the General Directorate of Migration in Turkey. The non-citizen population includes those with residency permits and the Syrian refugees with temporary protection status. A p value in bold type indicates a statistically significant difference.
[b]Percentages are across the rows. All other percentages are across columns.
[c]A *p*-value in bold type indicates a statistically significant difference.
[d]The study covered the first four months of the year 2018

DISCUSSION

Neglected tropical diseases (NTDs) are mostly a group of infectious diseases of the tropical and subtropical areas that may lead to significant morbidity (23). The World Health Organization added scabies to the list of NTDs in 2017 (24). Scabies is associated with social stigma, prevents those affected from socialization and attending to school or work, and has been reported to spark other infections (19-21). Although scabies may be endemic in developing or underdeveloped countries or regions in warmer climates, sporadic cases of scabies may be experienced in other countries, as is the case in Turkey. However, growing global

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population movements, particularly the illegal or irregular immigration from poverty-stricken areas with the endemic presence of infectious diseases such as scabies, result in significant public-health concerns and creates significant challenges to the healthcare systems in the immigrant-hosting countries that had not been inflicted with those endemic infections (14). This study investigated the number of scabies cases presented to a tertiary healthcare facility in north-central Turkey in reference to the patients' citizenship status.

Interestingly, it has been found that the period covered by this study exhibited three distinct episodes regarding the number of scabies cases presenting to the hospital. The first episode, which lasted for 30 months from January 2013 to June 2015, represented a period with a high number of recorded scabies cases (1223 cases in total with an average of 40.8 cases per month) but almost no scabies cases involving a non-citizen (19 cases in total with an average of 0.6 cases per month, which represent 1.6% of all cases in this period). The second episode lasted for 10 months from July 2015 to April 2016 and was marked by a very low number of recorded scabies cases (69 cases in total with an average of 6.9 cases per month) with small number of cases involving a non-citizen (3 cases in total with an average of 0.3 cases per month, which represent 4.3% of all cases in this period). The third episode lasted for 24 months from May 2016 to April 2018 and was marked by a surge of scabies cases (1025 cases in total, with an average of 42.7 cases per month). But this time, the number of scabies cases involving a non-citizen was considerably higher (205 cases in total with an average of 8.5 cases per month, which represent 20.0% of all cases in this period). These results do not indicate the prevalence of scabies in the larger citizen and non-citizen populations and are short of demonstrating a causal relationship between the scabies cases in the non-citizen and citizen populations. Nevertheless, the results suggest a significant, parallel increase in the number of scabies cases in these populations after a period of suppression of the infection that had been present in the citizen population. A healthcare system-wide study in the Province of Kayseri has found a similar suppression of scabies from 0.044% to 0.001% over ten years from 2006 to 2016 (25).

In 2018, the number of foreign nationalities with residency permits in Turkey was 856,470, the number of the Syrian refugees with temporary protection status in Turkey was 3,623,192, the number of applications for international protection status in Turkey was 114,537, and the number of irregular immigrants captured in Turkey was 268,003 (26). As of May 2019, a total of 116,989 Syrian refugees were housed in 13 temporary shelter centers in 8 provinces of Turkey. As of May 2019, 2,168 people with residency permits and 2,578 Syrian refugees with temporary protection status (outside the shelter centers) lived in the province of Çorum (975,472 and 3,606,737 people in Turkey, respectively) (26). However, these numbers do not indicate the total number of the immigrant refugee population in the province, and the study only includes the cases presenting to the particular hospital. Therefore, the numbers do not allow a comparison between the occurrences of scabies infections in the different populations.

A vast majority of non-citizens (irregular immigrants, refugees, asylum seekers, or residency-permit holders) in Turkey were from Syria, Iraq, Afghanistan, Pakistan, Bangladesh, or Palestine (26). Some of these countries lie in the areas with the highest disability-adjusted life-year burden due to scabies (27). As an infection transmitted through prolonged skin-to-skin contact between humans, scabies finds the perfect setting to spread in crowded refugee-shelter centers (28,29). Indeed, a recent study found scabies to be the most frequently contracted disease during the journey of asylum-seekers interviewed in Italy and Greece (30). Thus, scabies, a neglected tropical disease with the growing threat on other parts of the world due to increased irregular immigration, should be kept at bay through raising public awareness, improved sanitation of crowded housing centers, comprehensive surveillance, and appropriate treatment approaches (31).

Non-citizen patients presenting with scabies at the clinic were significantly younger than their citizen counterparts. The younger non-citizen population might be a reflection of the fact that 44% of the refugee immigrants in Turkey were reported to be under the age of 18, and only 1.6% were over the age of 65 (15). We also found that the average number of scabies cases presenting

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per month peaked in fall or winter months in agreement with the reports that lower temperatures and higher humidity extend the survival and infectivity period of the scabies mites away from the body of the host (3,32).

Limitations:

This study has some limitations. Firstly, the retrospective nature of the study prevented an in-depth analysis of the socio-economic conditions surrounding the cases. Secondly, the non-citizen patients could not be probed in terms of their nationality and legal status (i.e., legal alien, asylum-seeker, temporary protection, international protection, etc.) in Turkey. Finally, since this was a single-center study and no data was available on the categorized number of all non-citizens in the province based on their immigration status throughout the period covered by the study, it was not possible to draw prevalence data among the citizen or various non-citizen populations. A multi-center study covering all of the healthcare institutions supplemented by an absolute number of non-citizens in the province categorized by their immigration status would be able to produce a better picture of the impact of mass migrations on the outbreaks of an infectious disease such as scabies.

CONCLUSION

This study was the first to investigate the relationship between the occurrence of an infectious disease such as scabies in the non-citizen and citizen populations in a specific area. Most significantly, the study revealed a marked, parallel increase in the number of scabies cases in the non-citizen and citizen populations after one year of suppression of scabies infection that had been present in the citizen population. However, the study was short of demonstrating a causal relationship between the scabies cases in these populations. Nevertheless, given the spread of scabies in societies that have not faced the disease in this scale, we consider that epidemiological field studies related to the prevalence of scabies in immigrant populations, comprehensive surveillance studies, and appropriate treatment methodologies need to be implemented.

Conflicts of interest: The authors declare no conflict of interest.

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Ethical approval and consent to participate: All the methods in the study were approved by the Non-Interventional Clinical Research Ethical Committee of Hitit University (Date: 20/09/2018 #148). The study was carried out in accordance with the statement of Helsinki Declaration.

Authorship Contributions: Design of the study; CÖ, AÖ, ATÖ – Supervision; AÖ, ATÖ – Data collection &/or processing; AÖ, CÖ, EŞ – Performed data analysis; MAT – Literature search; CÖ, AÖ, ASG – Written by; CÖ, AÖ – Critical review; AÖ, ATÖ.

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