Araştırma Makalesi
Research Article

Implications from an ongoing scabies outbreak during the COVID-19 isolation period: Clues for controlling scabies today

COVID-19 İZOLASYON DÖNEMİNDE DEVAM EDEN UYUZ SALGININDAN ÇIKARIMLAR: BUGÜN UYUZ KONTROLÜ İÇİN İPUÇLARI

Fatmagül GÜLBAŞARAN[1,2], **Kamer GÜNDÜZ**[3]

[1] Manisa Salihli Devlet Hastanesi, Dermatoloji Kliniği, Türkiye
[2] Dokuz Eylül Üniversitesi Tıp Fakültesi Deri ve Zührevi Hastalıklar Anabilim Dalı, İzmir, Türkiye
[3] Manisa Celal Bayar Üniversitesi Tıp Fakültesi Dermatoloji Anabilim Dalı, Türkiye

ABSTRACT

Background: Contrary to the expectation that the number of scabies cases will decrease during the COVID-19 isolation period, scabies has been frequently reported in Turkey.

Objective: The aim of this study is to investigate the epidemiological pattern of the scabies outbreak in the context of the pandemic to provide additional information for the control of the devastating scabies outbreak that continues today.

Materials and Methods: Patients seen in our dermatology clinic before and during the pandemic were evaluated retrospectively.

Results: There was no decrease in the rate of scabies patients among all dermatology admissions during the pandemic period (n=143/2912; 4.9%) compared to the pre-pandemic period (n=526/11679; 4.5%) (p=0.348). The high incidence of the new scabies cases before the detection of COVID-19 in the country decreased in the quarantine period. However, the high recurrent admissions of old scabies cases, who already got scabies before pandemic but could not be cured despite repeated treatments, contributed to the ongoing high prevalence of scabies during the pandemic (one-third of all scabies cases seen during the pandemic, n=30/87).

Conclusions: We suggest that self-quarantine and increased hygiene during COVID-19 reduced re-infestations and led to a decrease in new cases. Treatment failure of old cases has been observed to contribute to the high prevalence of scabies in the pandemic. Permethrin resistance may have led to inadequate treatment success, given that treatment application errors, which may also lead to treatment failure, are managed with active surveillance in our patient population. Studies addressing permethrin resistance are needed as a priority.

Keywords: COVID-19 pandemics; permethrin; resistance; scabies

Fatmagül GÜLBAŞARAN
Dokuz Eylül Üniversitesi Tıp Fakültesi Deri ve Zührevi Hastalıklar Anabilim Dalı, İzmir, Türkiye
E-posta: drfatmagulgulbasaran@gmail.com
https://orcid.org/0000-0002-7550-6052

DEU Tıp Derg 2023;37(3):
J DEU Med 2023;37(3):
doi: 10.18614/deutip.1392053

Gönderim tarihi/Submitted: 16.11.2023
Kabul tarihi/Accepted: 18.12.2023

ÖZ

Arka plan: COVID-19 izolasyon döneminde, skabiyez vakalarının azalması beklenirken, Türkiye'de aksine, skabiyez sıkça rapor edilmiştir.

Amaç: Bu çalışmanın amacı, günümüzde devam eden yıkıcı uyuz salgınının kontrolü için ek bilgi sağlamak amacıyla, pandemi bağlamında uyuz salgınının epidemiyolojik yapısını araştırmaktır.

Yöntem: Dermatoloji kliniğimizde pandemi öncesinde ve pandemi sırasında görülen hastalar retrospektif olarak değerlendirilmiştir.

Bulgular: Pandemi döneminde tüm dermatoloji başvuruları arasında uyuz hastalarının oranında (n=143/2912; %4,9), pandemi öncesi döneme (n=526/11679; %4,5) kıyasla bir azalma gözlemlenmedi (p=0,348). Ülkede COVID-19 tespit edilmeden önce yeni uyuz vakalarının insidansı yüksek iken bu oran karantina döneminde azalmıştır. Ancak, pandemi öncesinde uyuz geçirmiş ancak tekrarlayan tedavilere rağmen iyileştirilemeyen eski uyuz vakalarının yüksek oranda tekrar başvuruları (pandemi sırasında görülen tüm uyuz vakalarının üçte biri, n=30/87), pandemi sırasında uyuz prevalansının yüksek düzeyde devam etmesine katkıda bulunmuştur.

Sonuçlar: COVID-19 sırasında karantina ve artan hijyenin, re-infestasyonları azalttığını ve yeni vakalarda bir azalmaya neden olduğunu düşünüyoruz. Ancak, eski vakalardaki tedavi başarısızlığının, pandemide uyuz prevalansına katkıda bulunduğu gözlemlendi. Hasta popülasyonumuzda tedavi uygulama hatalarının izlem ile yönetildiği göz önüne alındığında, permetrin direnci yetersiz tedavi başarısına yol açmış olabilir. Permetrin direncini ele alan çalışmalara öncelikli olarak ihtiyaç vardır.

Anahtar kelimeler: COVID-19 pandemisi; permetrin; direnç; skabiyez

In December 2019, several cases of viral pneumonia emerged in Wuhan, China, and by February 2020, the disease, named COVID-19, had spread all over the world, including throughout more than 196 countries (1). In March 2020, after the detection of the first case of COVID-19 in Turkey (2), various measures, mainly targeting social distancing, were taken to curtail the spread of the virus, including partial lockdown. These measures included a strong public awareness campaign encouraging staying at home; international travel restrictions; a switch to distance education; restrictions on gathering and public transport; and social distancing rules in many public places (3). During this period, the number of patient visits to dermatology outpatient clinics decreased alongside the strict "stay-at-home" policy (2, 3). Because it is a contagious parasitic disease, the rapid increase in the number of scabies cases in recent years was expected to drop during the COVID-19 isolation. However, in contrast to expectations, a relatively high prevalence of scabies cases among overall dermatology outpatient visits remained. This high prevalence during the isolation period led to speculation about the role of COVID-19 and related pandemic measures in this high number of cases (2-5). Household transmission of scabies during "stay-at-home" practices and transmission due to the high hospital-bed turnover caused by COVID-19 were some of the suggested causes (4). The aim of this study was to investigate the epidemiological pattern of the scabies outbreak in the context of the pandemic and related measures, and to provide additional information for the control of the ongoing scabies epidemic.

MATERIAL AND METHODS

In this retrospective hospital-based study, all patients who were admitted to our dermatology outpatient clinic between June 2019 and November 2020 were evaluated. The study design was approved by the Local Ethics Committee. Demographic features, dates of admission, number of visits, and diagnoses were noted from the electronic registration database of the hospital. The recorded features and the ratio of patients diagnosed with scabies during the COVID-19 pandemic period were compared with those during the pre-pandemic period. The history of the onset of itching and related treatments was also recorded in patients with scabies, who were seen during the pandemic period and whose information was obtained. Data on the COVID-19 pandemic period covered the period from March 11, 2020 to November 25, 2020. Pre-pandemic data covered the period from June 24, 2019 to March 10, 2020.

Statistical analyses were performed using IBM SPSS for Windows version 20.0 (SPSS, Chicago, IL, USA). A Kolmogorov-Smirnov test was used to assess the assumption of normality. Continuous variables that did not have normal distribution were expressed as median and interquartile range (IQR). Categorical variables were summarized as counts (percentages). Comparisons of non-normally distributed continuous variables and differences between the before and after pandemic groups were tested using the Mann Whitney U-test. Associations between categorical variables were determined by the Pearson Chi-square test. A two-sided p-value ≤ 0.05 was considered statistically significant.

RESULTS

During the COVID-19 pandemic period, 2912 admissions were made to our dermatology outpatient clinic. The total number of dermatology visits in the pre-pandemic period, which was delimited to include the same number of days as the pandemic period, was 11679. This translates to an approximately fourfold decrease in dermatology outpatient visits during the COVID-19 pandemic period. The differences in frequency of clinical visits, age, and gender distribution are shown in Table 1. The median age of patients who were admitted during the pandemic period was significantly lower than that in the pre-pandemic period (p=0.02); there was no significant difference in terms of gender (p=0.08).

Table 1. Frequency, age, and gender distribution of patients seen in our dermatology clinic during and before the COVID-19 pandemic.

		Before COVID-19 isolation	**During COVID-19 isolation**	**p**
		n (%)	**n (%)**	
Total number of visits to dermatology outpatient clinic (n=14591)		11679	2912	-
First and sole visits (n=10459)		8527 (73%)	1932 (66%)	-
Repeated visits (n=4132)		3152 (27%)	980 (34%)	-
Age (year) median (IQR)		32 (35)	30 (34)	**0.02**
Gender	Female	7126 (61%)	1725 (59.2%)	0.08
	Male	4553 (39%)	1187 (40.8%)	

The most common dermatological diseases seen during both periods were acne vulgaris/rosacea, eczematous disorders, superficial fungal infections, pruritus, and scabies (Table 2). Consistent with the decrease in overall outpatient visits during the COVID-19 pandemic period, the number of patients seen for each dermatological disease, including scabies, was lower during the COVID-19 pandemic period than during the pre-pandemic period. However, there was no decrease in the rate of scabies patients among all admissions during the pandemic period (4.9%) compared to the pre-pandemic period (4.5%) (no significant difference between the two periods: p=0.348).

Table 2. The diagnoses in patients seen in our dermatology outpatient clinic during and before the COVID-19 pandemic.

	Before COVID-19 isolation	**During COVID-19 isolation**
	n (%)	**n (%)**
Acne and rosacea	2402 (20.6%)	621 (21.3%)
Eczematous disorders	1743 (14.9%)	481 (16.5%)
Dermatophytosis	1440 (12.3%)	330 (11.3%)
Pruritus	679 (5.8%)	143 (4.9%)
Scabies	526 (4.5%)	143 (4.9%)
Seborrheic dermatitis	492 (4.2%)	142 (4.9%)
Benign neoplasms of skin	462 (4%)	53 (1.8%)
Viral warts	398 (3.4%)	67 (2.3%)
Local infections of skin and subcutaneous tissue	344 (2.9%)	65 (%2.2)
Nonscarring hair loss	343 (2.9%)	72 (%2.5)
Actinic keratosis	342 (2.9%)	32 (%1.1)
Others	2508 (%21,5)	763 (%26.2)
Total	11679	2912

The onset of clinical disease was defined as the date of onset of itching in scabies patients. These dates were recorded for scabies patients seen during the COVID-19 pandemic period and whose information was available in their anamnesis records (n=87). According to this data, approximately one-third (n=30/87) of the patients with scabies seen during the COVID-19 pandemic period were patients who already had scabies in the pre-pandemic period and continued to be seen in the hospital during the pandemic period due to treatment failures.

The temporal distribution of the onset dates of clinical diseases of scabies patients showed that the high

incidence of new scabies cases right before the detection of COVID-19 in the country (11.03.2020) continued in the early days of the pandemic (Fig. 1, orange-colored area), but after a few weeks, the numbers of new scabies cases decreased with the isolation period (Fig. 1, yellow-colored area). Later, however, at the middle of the summer, they increased once again (Fig. 1, the gray-colored area).

Figure 1:

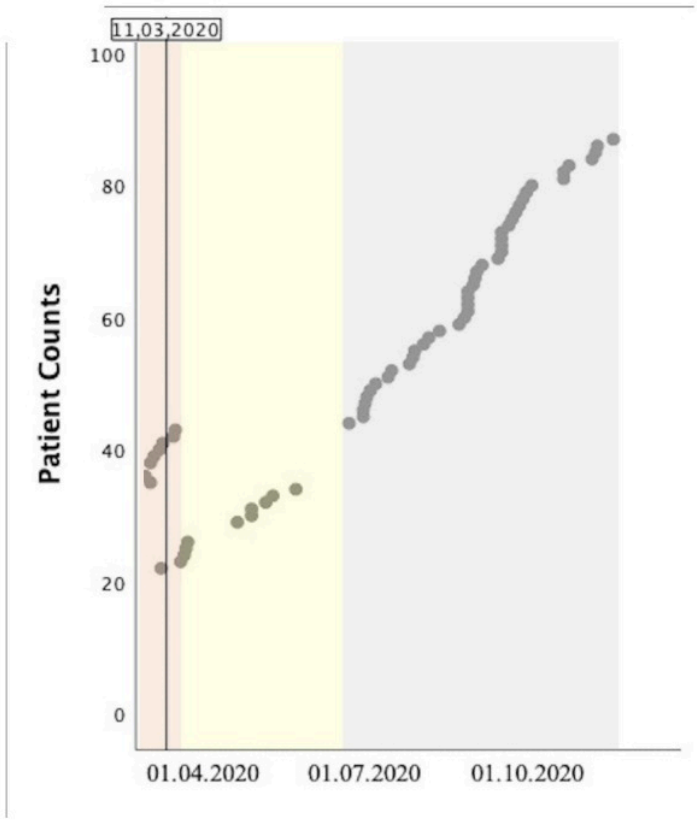

Figure 1. Emergence of new scabies cases according to the date of onset of clinical disease during and just before the COVID-19 pandemic. (March 11, 2020, is the day of the first confirmed COVID-19 case in the country.) The orange-colored areas just before and after the beginning of the pandemic indicate the time periods when the incidence of new cases of scabies is high, while the yellow area indicates the time period when the incidence of new cases of scabies is relatively low. The gray-colored area shows the time period when the rate of emergence of new cases of scabies began to increase again.

DISCUSSION

Acne, dermatitis, and dermatophytosis were the most frequently seen diseases in our dermatology clinic, both during and before the COVID-19 pandemic. These three conditions make up the most common diagnoses in other Turkish governmental dermatology clinics, too, as illustrated by a 2011 report (5). Scabies cases were also among the most frequent diagnoses seen in the present study. This is an expected result, considering the current scabies epidemic, which has been ongoing during the last four years. In recent years, in addition to studies from

Turkey (6, 7) several reports from European countries have also noted an increase in scabies cases, indicating that this is a global problem (7, 8).

We would expect that cases of scabies, a transmissible parasitic disease, would fall dramatically during the pandemic because of the strict isolation. But the results of this study showed that the high rates of the scabies cases in dermatology admissions continued during the pandemic period. The percentage of scabies cases among all our patients during the COVID-19 pandemic was 4.9%, and there was no significant difference compared to the pre-pandemic period (4,5%, p=0.348). Cengiz et al. also reported a scabies percentage of 4.9% in a tertiary-care hospital during the outbreak of SARS-CoV-2 in Istanbul (2). Another study from Turkey examining the change in diagnostic distributions in dermatology outpatients in response to the COVID-19 pandemic also found no difference in the frequency of scabies before vs. during the pandemic (9).

Kutlu et al. proposed several explanations for the high prevalence of scabies in pandemic period, including increased household transmission during "stay-at-home" practices as well as COVID-19-related high transmission related to the high hospital bed turnover rate, and migration of patients from urban to scabies-prevalent rural areas due to temporary workplace closure (3,4). But scabies spreads easily to household members even without a stay-at-home policy (12). This is the reason we treat all family members of patients with scabies at the first visit. The increased hospital bed turnover during the COVID-19 pandemic as a source of the scabies explosion seems even less likely because hospital beds and rooms have been sterilized as never before during the pandemic. Not only were rooms disinfected to eliminate SARS-CoV-2, but many were even kept waiting for some time before new patients were allowed in. In addition, the scabies outbreak in recent years was not limited to rural areas in Turkey before the COVID-19 pandemic; a serious increase in scabies cases in the last four years was reported from hospitals in urban regions as well (6, 10). Therefore, it may be misleading to relate high numbers of scabies cases to the course of the pandemic and the resulting societal disease-control measures.

To observe possible reasons that may contribute to the ongoing high prevalence of scabies during the pandemic period, we reviewed the electronic patient records of the scabies patients seen in our clinic during this period. The temporal distribution of the dates of onset of clinical disease of the scabies patients seen in the pandemic period in our dermatology clinic was examined. These data showed that the emergence of new cases, in fact, decreased 2 weeks after from the beginning of the strict quarantine period in the country (11.03.2020), as expected (the yellow-colored area in Fig.1 shows the time period of the decreased incidence of new cases; the orange-colored areas in Fig.1 just before and after the beginning of the pandemic indicate the time periods when the incidence of new cases of scabies was relatively high). Later, it was observed that the emergence of new cases increased again in the summer months, in parallel with the relaxation in quarantine. (Fig. 1, the gray-colored area, the time period when the rate of emergence of new cases of scabies began to increase again). Due to the long incubation period of scabies (2-6 weeks), it can be understood that the ongoing high incidence of new scabies cases in the first two weeks of the quarantine was most likely due to scabies transmissions from the pre-quarantine period. The strict measures taken in the early period of the pandemic, such as curfew and stay-at-home policies seems to indeed lead to a decrease in scabies spread leading the decrease in the incidence of scabies, which was clinically noticeable two weeks after (Fig. 1 yellow period). The increase in the number of new cases seen from the end of June through the end of summer is probably due to the relaxation of societal disease-control measures and summer vacations, which lead to more socialization.

Therefore, the results indicate that the incidence of scabies decreased during the pandemic isolation period, and the high recurrent admissions of old scabies cases, who already got scabies before the covid pandemic but could not get rid of the disease despite repeated treatments, seem to have contributed to the ongoing high prevalence of scabies during the pandemic (one-third of all scabies cases seen during the pandemic, n=30/87). In fact, these results support our and many dermatologists' current clinical observations of a significant increase in treatment failures

of scabies despite the best efforts of patients and physicians. Poor adherence to the prescribed treatment regimen and cleaning recommendations is the first thing that comes to mind in the treatment failure in scabies. Therefore, to control the scabies outbreak by addressing this problem, we had provided municipal cleaning services and treatment under the supervision of healthcare professionals with active surveillance for each case diagnosed in our clinic and their close contacts, in their home, since before the pre-pandemic period, by establishing a large working team with the Communicable Diseases Branch of the Health Directorate. Despite these measures, repeated admissions of the same patients with exacerbation after varying degrees of improvement in their symptoms strongly suggested that permethrin resistance might be present. This was a difficult idea to evaluate, though; since the widespread scabies epidemic could not be prevented, the possibility of rapid reinfestation could not be ruled out. During the COVID-19 pandemic, however, the possibility of reinfestation almost disappeared with the hygiene and self-isolation measures. The fact that patients could not fully get rid of scabies during the pandemic period, despite repeated treatments for months since before the pandemic, may therefore be considered as an important clinical observation supporting permethrin resistance. Although it is suggested in the literature that treatment application errors are responsible for the majority of treatment failures in scabies and incorrectly attributed to the treatment resistance (11), reports regarding failure due to permethrin resistance, in line with our results, are also growing (12).

In conclusion, self-quarantine and increased hygiene practices during the COVID-19 isolation period seem to have led to a decrease in the incidence of scabies by preventing transmission and re-infection. Resistance to permethrin may have led to insufficient treatment success and a consequent ongoing high prevalence of scabies in our patient population, where unsuccessful treatment and cleaning practices were largely excluded by active surveillance.

The deleterious impact of scabies in developing regions worldwide is without question. In the last decade, developed countries have also been affected by the impact of various factors such as mass displacements (7, 8). Months of unsuccessful treatment attempts put the physician and the patient in a difficult stalemate cycle. In this report, we have presented the treatment data of our clinic, which has been working in an organized manner for the control of the scabies epidemic in recent years, in order to draw attention to the urgent necessity of clinical and laboratory studies investigating permethrin resistance and the therapeutic options addressing this problem.

REFERENCES

1. Srivastava N, Baxi P, Ratho R, Saxena SK. Global trends in epidemiology of coronavirus disease 2019 (COVID-19). Coronavirus Disease 2019 (COVID-19) Epidemiology, Pathogenesis, Diagnosis, and Therapeutics. 2020:9-21.
2. Cengiz FP, Emiroglu N, Bahali AG, Dizman D, Taslidere N, Akarslan TC, et al. Which dermatology patients attend to dermatology outpatient clinics during the SARS-CoV-2 outbreak in Turkey and what happened to them? Dermatologic therapy. 2020;33(4):e13470.
3. Kutlu Ö, Güneş R, Coerdt K, Metin A, Khachemoune A. The effect of the "stay-at-home" policy on requests for dermatology outpatient clinic visits after the COVID-19 outbreak. Dermatologic Therapy. 2020;33(4):e13581.
4. Kutlu Ö, Aktaş H. The explosion in scabies cases during COVID-19 pandemic. Dermatologic Therapy. 2020;33(5).
5. Bilgili ME, Yildiz H, Sarici G. Prevalence of skin diseases in a dermatology outpatient clinic in Turkey. A cross-sectional, retrospective study. Journal of dermatological case reports. 2013;7(4):108.
6. Aktaş H, Cebecik A. Changes in incidence and age distribution of scabies: A retrospective cohort study in a tertiary hospital. Archives of Clinical and Experimental Medicine. 2019;4(1):21-4.
7. Sunderkötter C, Aebischer A, Neufeld M, Löser C, Kreuter A, Bialek R, et al. Increase of scabies in Germany and development of resistant mites? Evidence and consequences. JDDG: Journal der

Deutschen Dermatologischen Gesellschaft. 2019;17(1):15-23.

8. Amato E, Dansie LS, Grøneng GM, Blix HS, Bentele H, Veneti L, et al. Increase of scabies infestations, Norway, 2006 to 2018. Eurosurveillance. 2019;24(23):190020.

9. Turan Ç, Metin N, Utlu Z, Öner Ü, Kotan ÖS. Change of the diagnostic distribution in applicants to dermatology after COVID-19 pandemic: What it whispers to us? Dermatologic Therapy. 2020;33(4):e13804.

10. Özden M, Ertürk K, Kartal S, Yayli S, Göktay F, Doğramacı C, et al. An extraordinary outbreak of scabies in Turkey. Journal of the European Academy of Dermatology and Venereology: JEADV. 2020;34(12):e818-e20.

11. Nemecek R, Stockbauer A, Lexa M, Poeppl W, Mooseder G. Application errors associated with topical treatment of scabies: an observational study. JDDG: Journal der Deutschen Dermatologischen Gesellschaft. 2020;18(6):554-9.

12. Mazzatenta C, Piccolo V, Argenziano G, Bassi A. Is Scabies becoming less sensitive to permethrin therapy? Journal of the European Academy of Dermatology and Venereology: JEADV. 2021;35(9):e607-e9.