



Relative changes in the pattern of diseases presenting in dermatology outpatient clinic in the era of the COVID-19 pandemic

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Abstract

As an increasing number of COVID-19 cases, there were changes in the number of patients who attended the dermatology outpatient clinics. We aimed to investigate the change profiles of dermatologic diseases in the first and second months of the COVID-19 pandemic in Turkey by comparing with the corresponding period of the previous year. The total number and diagnosis of patients, who attended a tertiary care hospital for the dermatology outpatient clinic between 1 April 2020 and 31 May 2020, were included in this study. These data were compared with the corresponding period of the previous year. The percentage of the patients with scabies, contact dermatitis, psoriasis, pityriasis rosea, urticaria, and alopecia areata were statistically significantly increased a month after the occurrence of the COVID-19 pandemic, while the percentage of patients with scabies, alopecia areata, telogen effluvium, acne vulgaris, and xerosis cutis were statistically significantly increased 2 months after the occurrence of the COVID-19 pandemic ($P < 0.05$). An increase in the number of certain diseases such as urticaria and pityriasis rosea may indicate the risk of asymptomatic COVID-19 carriage in these patients. Polymerase chain reaction (PCR) and/or antibody-based further studies should be performed to explore whether certain dermatologic diseases are related to asymptomatic COVID-19 cases.

KEYWORDS

COVID-19, dermatology, outpatient clinic

1 | INTRODUCTION

The new coronavirus, which caused a global pandemic following the first identified case in Wuhan, China in December 2019, has an enormous impact on the different aspects of life.^{1,2} There are 14 348 858 confirmed cases of COVID-19, including 603 691 deaths, according to report of WHO on 20 July 2020.³ As an increasing number of COVID-19 cases and deaths, there was a decrease in the number of people who attended hospitals in all branches of medicine.⁴⁻⁶ In addition, the profiles of diseases including dermatologic diseases are changed in the era of the COVID-19 pandemic.⁷⁻⁹ The first case of COVID-19 infection has been confirmed in Turkey on 11 March 2020

and a lot has been changed since then. In this regard, many measurements including cities to be "placed under a blanket curfew" on weekends and holidays, government orders to limit the activity of hospitals, restrictions on the cafes, schools, gatherings, and flights were taken to deal with the COVID-19 pandemic.¹⁰ Under these certain circumstances, the number of patients who request to visit dermatology outpatient clinics as well as the spectrum of the dermatologic diseases was fairly influenced due to the psychological and other side effects of the pandemic.^{2,11} Therefore, in this study, we aimed to investigate the change profiles of dermatologic diseases in the first and second months of the COVID-19 pandemic by comparing with the corresponding period of the previous year.

2 | MATERIALS AND METHODS

2.1 | Study design

The study was carried out at Uşak Training and Research Hospital, which is an only tertiary hospital in the city of Uşak. Preventive measures of COVID-19 are increased to the highest level in April and May 2020 in Turkey. Therefore, the total number and diagnosis of patients who attended the Uşak Training and Research Hospital for the dermatology outpatient clinic between 1 April 2020 and 31 May 2020, were included in this study. A total number and diagnosis of patients who attended the hospital in the corresponding period of the previous year were also investigated in order to exclude seasonal impacts by searching the hospital registry system. The statistical differences between the percentage of dermatologic diseases before and after the COVID-19 pandemic were investigated. All describing data for patients with diagnosis codes, (International Classification of Diseases [ICD-10]) was extracted from the Uşak Training and Research Hospital database.

The study was approved by the Ministry of Health Scientific Research Platform (Application number: 2020-06-10T00_32_09) and the Institutional Review Board.

2.2 | Statistical analysis

Data were evaluated using the SPSS 20.0 (SPSS Inc., Chicago, Illinois) program, and P -value as $0 < 0.05$ was considered statistically significant. Variables in the study were analyzed with descriptive statistics using their percentages. A chi-square test was used for categorical data differences between groups. Pearson's chi-square test was used for categorical data differences between groups. The odds ratio was used to quantify the strength of the association between groups.

3 | RESULTS

A total of 2442 patients presented to the dermatology outpatient clinics in April 2019 while 738 patients presented in April 2020 with a 69.78% reduction in admissions to dermatology outpatient clinics. On the other hand, 4506 patients presented to the dermatology

outpatient clinics in May 2019 while 1016 patients presented to the dermatology outpatient clinic in May 2020 with a 77.45% reduction in admissions to dermatology outpatient clinics.

The percentage of the patients with scabies, contact dermatitis, psoriasis, pityriasis rosea, urticaria, and alopecia areata were statistically significantly increased in a month after the occurrence of the COVID-19 pandemic ($P < 0.001$, <0.001 , 0.001 , 0.009 , 0.014 , 0.001 , respectively) (Table 1) while the percentage of patients with scabies, alopecia areata, telogen effluvium, acne vulgaris, and xerosis cutis were statistically significantly increased 2-month after the occurrence of the COVID-19 pandemic ($P < 0.001$, 0.001 , 0.001 , 0.001 , 0.001 , respectively) (Table 2). Other dermatologic diseases with significantly decreased/not changing one and two months after the occurrence of the COVID-19 pandemic are shown in Tables 3 and 4.

The odds ratio for diseases that increased during the COVID-19 pandemic is shown in Table 5.

4 | DISCUSSION

To the best of our knowledge, there are a few studies on the profiles of dermatologic disease for those who presented to the outpatient clinic. In this study, we evaluated the first two months of COVID-19 pandemic apart from our first study, which analyzed 10 days after the outbreak.⁴ We found that percentages of scabies, contact dermatitis, xerosis cutis, psoriasis, pityriasis rosea, urticaria, alopecia areata, and telogen effluvium significantly increased during the COVID-19 pandemic. On the other hand, the percentages of diseases such as dermatophytosis, warts, molluscum contagiosum, and recurrent aphthous stomatitis significantly decreased. In our first study, we found a high rate of patients with scabies, contact dermatitis, xerosis cutis, acne, warts, seborrheic dermatitis, urticaria, and psoriasis after the first 10 days of the pandemic.⁴ However, according to the current study, in the following days of the pandemic percentages of pityriasis rosea, alopecia areata as well as telogen effluvium increased. Ehsani et al reported that patient with pityriasis rosea may be presented as a cutaneous manifestation of COVID-19 infection.¹² In accordance with our study, Dursun and Temiz reported that the percentage of patients with pityriasis rosea increased during the pandemic when compared at the same time as the previous year. They discussed in their report that reactivation of HHV-6 due to new coronavirus could explain this

Diseases	ICD-10 code	April 2019	April 2020	P values
		Percentage (%)	Percentage (%)	
Scabies	B86	1.23	6.23	<0.001
Contact dermatitis	L23, L24, L25	6.96	11.25	<0.001
Psoriasis	L40	2.25	6.78	0.001
Pityriasis rosea	L42	0.70	1.76	0.009
Urticaria	L50, L50.1	4.10	7.86	0.014
Alopecia areata	L63	1.02	2.71	0.001

TABLE 1 Changes in frequency of dermatologic diseases a month after the occurrence of the COVID-19 pandemic

Note: COVID-19 first appears on 11 March 2020 in Turkey.
Abbreviation: ICD, International Classification of Diseases.

TABLE 2 Changes in frequency of dermatologic diseases 2-months after the occurrence of the COVID-19 pandemic

Diseases	ICD-10 code	May 2019	May 2020	P values
		Percentage (%)	Percentage (%)	
Scabies	B86	0.15	1.97	<0.001
Xerosis cutis	L85.3	3.08	5.70	0.001
Acne	L70	23.68	41.33	0.001
Telogen effluvium	L65	0.40	2.17	0.001
Alopecia areata	L63	0.97	1.48	0.001

Abbreviation: ICD, International Classification of Diseases.

TABLE 3 Dermatologic diseases which decreased or did not change significantly a month after the occurrence of the COVID-19 pandemic

Diseases	ICD-10 code	April 2019	April 2020	P values
		Percentage (%)	Percentage (%)	
Herpes vesicular dermatitis	B00.1	0.86	0.81	0.903
Herpes zoster	B02	2.74	3.38	0.271
Dermatophytosis	B35	12.16	4.20	<0.001
Warts	B07	10.24	4.88	<0.001
Anogenital warts	A63.0	3.60	1.43	0.084
Molluscum contagiosum	B08.1	2.13	0.41	0.002
Recurrent aphthous stomatitis	K12.0	0.94	0.00	0.008
Seborrheic dermatitis	L21	8.80	7.45	0.300
Telogen effluvium	L65	0.21	0.54	0.131
Acne	L70	18.47	10.16	0.000
Xerosis cutis	L85.3	6.83	7.72	0.410

Note: COVID-19 first appears on 11 March 2020 in Turkey.
Abbreviation: ICD, International Classification of Diseases.

TABLE 4 Dermatologic diseases which decreased or did not change significantly 2-months after the occurrence of the COVID-19 pandemic

Diseases	ICD-10 code	May 2019	May 2020	P values
		Percentage (%)	Percentage (%)	
Herpes vesicular dermatitis	B00.1	0.31	0.69	0.075
Herpes zoster	B02	0.44	0.07	0.318
Dermatophytosis	B35	4.48	3.05	0.002
Warts	B07	1.50	1.37	0.755
Anogenital warts	A63.0	1.51	0.89	0.126
Molluscum contagiosum	B08.1	0.89	0.39	0.110
Recurrent aphthous stomatitis	K12.0	0.22	0.20	1.000
Seborrheic dermatitis	L21	8.01	6.10	0.050
Contact dermatitis	L23, L24, L25	5.39	4.63	0.389
Psoriasis	L40	1.86	0.98	0.050
Pityriasis rosea	L42	0.18	0.20	1.000
Urticaria	L50, L50.1	0.82	0.98	0.241

Note: COVID-19 first appears on 11 March 2020 in Turkey.
Abbreviation: ICD, International Classification of Diseases.

obvious increase percentage of pityriasis rosea cases.⁷ Of note, confirmatory testing for COVID-19 in patients with pityriasis rosea will illuminate whether patients with pityriasis rosea is an asymptomatic carrier for COVID-19 infection.

As a result of this study, it has been revealed that the COVID-19 pandemic leads to a new perspective on the emotional stress time for

hair diseases that may have been triggered by psychological distributions. As compared with corresponding to the previous year, the percentage of alopecia areata 2.83 and telogen effluvium 5.51 times increased. A previous study reported that emotional stress-related conditions such as undesirable events and death for the last 6 months are statistically more increased in patients with alopecia areata than in

Diseases	ICD-10 codes	Value	95% confidence interval	
			Lower	Upper
April 2020				
Scabies	B86	5.593	3.517	8.895
Contact dermatitis	L23, L24, L25	1.706	1.295	2.245
Psoriasis	L40	3.222	2.181	4.760
Pityriasis rosea	L42	2.558	1.236	5.291
Urticaria	L50, L50.1	1.603	1.079	2.380
Alopecia areata	L63	2.832	1.576	5.088
May 2020				
Scabies	B86	12.906	5.442	30.604
Xerosis cutis	L85.3	1.937	1.417	2.647
Acne	L70	2.271	1.970	2.619
Telogen effluvium	L65	5.518	2.949	10.327
Alopecia areata	L63	2.236	1.198	4.171

Abbreviation: ICD, International Classification of Diseases.

the control group.¹³ However, given the significantly increasing number of hair diseases including alopecia areata and telogen effluvium during the COVID-19 pandemic, it can be concluded that short term (<2 months) history of emotional stress may be more important than the long-term history of emotional stress for alopecia areata and telogen effluvium.^{9,14} According to this study, scabies cases increased 5.59 times in April 2020 while 12.91 times in May 2020 as compared with the corresponding periods of the previous year. The logarithmic increasing number of scabies in the following days of COVID-19 pandemic may be due to temporary moving from urban to rural areas, increasing close contact as a result of the stay at home orders and increasing hospital bed turnover because of COVID-10 cases. Nevertheless, social and cultural differences among countries can lead to different disease processes.¹⁵ In this study, we found that contact dermatitis and xerosis cutis have similar odds ratios. Increasing the percentage of these diseases may be relevant to the enhanced preventive hygiene measures with antiseptics and cologne to halt COVID-19 infection.^{16,17} Contact dermatitis was more common in the first month after pandemic while xerosis cutis in the second month of the pandemic. Patient education during the course of the COVID-19 pandemic might have been playing an important role in decreasing the contact dermatitis cases.

An increasing percentage of the urticaria and psoriasis is expected during the pandemic, which has deep impacts on the quality of life.^{18,19} Furthermore, it should be highlighted that acute urticaria may be one of the presentations of COVID-19.²⁰⁻²² It can be speculated that patients with urticaria who do not have any underlying cause should be investigated for possible COVID-19 infection as in cases of other certain skin manifestations including pityriasis rosea.^{7,23,24} However, the increase in their frequency may also be due to the fact that people were more concerned about skin rash as it has been reported that there may be a skin rash in patients with COVID-19. Further studies are required to determine the relationship between certain skin diseases and COVID-19. Apart from the present study conducted on our dermatology outpatient clinic, the study from Poland described patients who hospitalized for

TABLE 5 The odds ratio for diseases which increased during the COVID-19 pandemic

dermatologic diseases during the COVID-19 pandemic. In that study, increased the percentages of erysipelas, syphilis, primary cutaneous lymphomas, and psoriasis among hospitalized patients were reported. Authors discussed that the hospitalization of the high percentage of patients with psoriasis might be linked to the compliance of patients receiving biologic agents.¹¹ Additional factors for an increasing percentage of patients with psoriasis may be due to the high numbers of use of hydroxychloroquine treatment, increased stress burden due to quarantine policies, and possible triggering of COVID-19 infection.^{18,19} Interestingly, the number of patients with acne significantly decreased in a month after the COVID-19 (April, 2020) pandemic whereas increased after 2 months (May, 2020). This may be related to circumstances that Turkey imposed a curfew on young citizens under 20 on 4 April 2020. Thus, it can be speculated that after the first impact of lockdown order, patients with acne could not present to the hospital. However, after a month that occurrence of the loose lockdown circumstances and probably worsening of acne during that time might have encouraged these patients to attend hospitals in May. It is a well-established fact that global use of face masks is increased due to the control of spread of infection from asymptomatic carriers.²⁵ The enhanced flare of acne mechanica in the course of time may be another reason that can explain a significantly increasing number of patients with acne after 2 months of COVID-19 pandemic.^{4,8}

Dermatophytosis, warts, molluscum contagiosum, and recurrent aphthous stomatitis are among diseases that significantly decreased during the COVID-19 pandemic as compared with the corresponding period in the last year. The statistically significantly decreasing number of patients with fungal diseases and warts may indicate that these diseases may be postponed under certain conditions.²⁶ In other words, people are afraid to visit the hospital during the COVID-19 pandemic due to fear of being exposed to the virus, therefore, significantly decreasing of the number of certain diseases such as fungal infections, warts, and molluscum contagiosum may show that these diseases may affect the quality of life lesser than other dermatologic diseases which increased during the COVID-19 pandemic. Nevertheless, the decreasing number

of patients with molluscum contagiosum may also be related to the decreasing of extra-marital sexual activity due to lockdowns.²⁷

There are some limitations to our study. These limitations can be listed as a retrospective nature of the study, conducted in a single tertiary care center, and the lack of demographic and clinical details of patients that restrains further analysis of the impact of diseases. Furthermore, this study describes the effect of COVID-19 pandemic on dermatologic diseases until the 3 months. As pandemic continues to spread, the new result may occur.

In conclusion, the COVID-19 pandemic changes the nature of the dermatologic disease presented to the outpatient clinic as we proceed to adapt our practice habits during the COVID-19 pandemic. This study gives some clues about the impact of the dermatologic disease on the quality of life, which may affect our treatment approaches. In addition, the increase in certain diseases such as urticaria and pityriasis rosea may indicate the risk of asymptomatic COVID-19 carriage in these patients. Polymerase chain reaction and/or antibody-based further studies should be performed to explore whether certain dermatologic diseases are related to asymptomatic COVID-19 cases.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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