Did Dermatological Hospital Referrals and Practice of Dermatologists Change in Between Pre-covid and Covid Era? A Short-term Preliminary Evaluation

Ayşe Kavak, Gamze Erfan, İkbal Esen Aydıngöz[1], Figen Demir[2], Gülşen Tükenmez-Demirci, Dilek Bıyık-Özkaya, Deniz Demircioğlu[3], Murat Yılmaz[4], Rabia Karapıçak[5], Sedef Şahin[3]

Acıbadem Mehmet Ali Aydınlar University, School of Medicine, Department of Dermatology, Atakent Hospital, İstanbul, [1]Acıbadem Mehmet Ali Aydınlar University, School of Medicine, Department of Public Health, Kozyatağı Hospital, İstanbul, [2]Acıbadem Mehmet Ali Aydınlar University, School of Medicine, Department of Public Health, İstanbul, [3]Acıbadem Mehmet Ali Aydınlar University, School of Medicine, Department of Dermatology, Maslak Hospital, İstanbul, [4]Acıbadem Zekeriyaköy Medical Center, İstanbul, [5]Acıbadem Mehmet Ali Aydınlar University, School of Medicine, Medical Student, İstanbul, Turkey

Abstract

Objective: In this descriptive study, we aimed to evaluate features of dermatology referrals before and after Covid-19 pandemic. **Materials and Methods:** The patients referred to dermatology outpatient clinics of Acıbadem Group Hospitals in Istanbul between the time intervals 2019 March 1st and August 31st (Group G1) and 2020 March 1st and August 31st (Group G2) were included in this study. G1 and G2 groups were compared in terms of age, gender, mean duration of complaints, the most common five anatomic regions and the most common five dermatoses. **Results:** Referral rate after Covid-19 pandemic was decreased by 40%. Face (p=.0013, OR= 1.20, 95% CI=1.07–1.34), scalp (p=.02, OR=1.23, 95% CI=1.02–1.48) and hand (p=.04, 95% OR=1.24, 95% CI=1.00–1.54) were more common locations in 2020 (group G2) than in 2019 (G2 group). The most common five dermatoses were contact dermatitis (8.3%), acne (8,1%), wart (7,0%), seborrheic dermatitis (5,7%) and pyoderma (5,5%) in G1 (2019), while the order was contact dermatitis (10,6%), acne (7,5%), seborrheic dermatitis (6,5%), wart (6,4%) and pyoderma (4,9%) in G2 (2020). Contact dermatitis showed a significant increase after pandemic (p=.0017, OR=1.29, 95% CI=1.10–1.51). In 2020, psoriasis and lichen planus showed a two-fold increases (P<.001, OR=2.00, 95% CI=1.43–2.79 and p=.03, OR=1.92, 95% CI=1.09–3.38, respectively), whereas frequency of molluscum contagiosum decreased significantly (p=.03, OR=0.49, 95% CI=0.26–0.92). **Conclusion:** Although we found some remarkable results, relatively short-term period design with the limited patient population of this study needs to be verified in more comprehensive studies.

Keywords: Covid-19, dermatology, outpatient clinic, pandemic, referral

Introduction

Since the announcements of SARS-CoV-2 virus infection (Covid-19) as a global pandemic at the beginning of March 2020 by the World Health Organization the Covid-19 outbreak has had destructive effects on social, educational and working aspects of daily life. Furthermore, the negative impacts on medical practice have been various such as decreased hospital admissions, delayed diagnoses and treatments. Accordingly, skin cancers and some cutaneous disorders have had late diagnoses and treatments on dermatology practice.[1-3]

As an ongoing global pandemic, accumulation of new data on skin findings of Covid-19 infection has accelerated and most of it has been included in the literature. The indirect

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Address for correspondence: Prof. Ayşe Kavak, Acıbadem Mehmet Ali Aydınlar University, School of Medicine, Department of Dermatology, Atakent Hospital, Turgut Özal Bulvarı, Küçükçekmece, 34303 İstanbul, Turkey.
E-mail: ayse.kavak1@gmail.com

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skin effects of Covid-19 outbreak are highly predictable such as frequent hand washing and antiseptic-related hand eczema, skin damage and facial contact dermatitis due to mask use, and exacerbations of acne, rosacea, and seborrheic dermatitis.[2-6]

According to the relevant data and these assumptions there is an intriguing question that if there has been a change or difference of the frequencies of some cutaneous disorders when compared to pre- and post-covid era. The first case in Turkey was detected in March 2020. We aimed to investigate skin findings that might have a direct or indirect effect of Covid-19 infection. Thus, a clinical and demographic comparison was made between the same 6-month period of the year in 2019 and 2020.

Materials and Methods

The patients who attended to dermatology outpatient clinics of Acıbadem Health Group in İstanbul (Atakent, Altunizade, Kozyatağı, Maslak and Zekeriyaköy Hospitals) between the time intervals 2019 March 1st and August 31st (Group 1=G1) and 2020 March 1st and August 31st (Group 2=G2) were included in the study. Data were collected from the electronic records. G1 and G2 groups were compared in terms of age, gender, mean duration of complaints, involvement of one or more areas, the most common five anatomic regions and the most common five dermatoses. Pediatric (≤1, 2–5, 6–17 years-old) and adult (≥18 years-old) referral frequency were evaluated according to age subgroups and in between in G1 and G2 groups.

Selected inflammatory (psoriasis, lichen planus, seborrheic dermatitis, urticaria, pityriasis rosea rosacea), infectious (herpes zoster and molluscum contagiosum) and hair disorders (alopecia areata and telogen effluvium) were compared between two groups.

Patients were questioned about having current diagnosis of Covid-19 infection.

This study was approved by both Ministry of Health Scientific Research Platform (2020-08-19T20_43_02) and the Ethics Committee of Acıbadem Mehmet Ali Aydınlar University (2020 -27/01).

Statistical analysis

All data were analyzed using the Statistical Package for the Social Sciences for Windows software version 18.0 (SPSS, Chicago, IL). Descriptive statistical methods (mean, standard deviation, median, frequency, percentage, minimum, maximum) were utilized to evaluate numerical data. Also, the descriptive analyses presented using frequency tables for the categorical variables. The Chi-square was used to compare categorical variables. *P* values \ 0.05 were considered to be statistically significant.

Results

In this descriptive study, a total of 7273 patients were included. The age of the patients ranged from 0 to 97 years, and the mean age was 33.0 ± 18.28. The demographic and clinical characteristics of the patients by groups (G1 and G2) were summarized in Table 1. None of the patients had the current diagnosis of Covid-19 infection.

The number of patients in G1 and G2 groups consisted of 4434 and 2839, respectively. The attendance of dermatology outpatient clinics decreased by 40% in the 6-month period between March and August 2020 (G2) compared to the same period of the previous year (G1).

No statistical significance was found in gender and pediatric vs. adult age comparisons except for a significant increase in a subgroup of pediatric female patients ≤1 year of age in G2 group (p=.03, OR=1.92, 95% CI=1.09–3.38) [Table 2].

The mean duration of complaints in G1 and G2 groups were 94.2 and 64.2 days, respectively [Table 1]. Patients had longer waiting times before admitting to outpatient clinics for their dermatoses in 2019 when compared to 2020 ($P < 0.001$).

No statistical difference was found in terms of the number of localizations (one or ≥2) [Table 1]. The most frequent five anatomic regions of dermatoses in G1 and G2 groups were shown in Table 1. Face (p=.0013, OR= 1.20, 95% CI=1.07–1.34), scalp (p=.02, OR=1.23, 95% CI=1.02–1.48) and hand (p=.04, 95% OR=1.24, 95% CI=1.00–1.54) were the more common localizations in 2020 (G2) than in 2019 (G1). Foot, trunk, scalp and leg demonstrated no statistical significance between the two groups (p>.05).

The most common five dermatoses were summarized in Figure 1. Contact dermatitis increased in G2 group (p=.0017, OR=1.29, 95% CI=1.10–1.51). Others showed no statistical difference between G1 and G2 groups [Table 3]. Comparison of the selected inflammatory, infectious and hair disorders in two groups revealed that psoriasis ($P < 0.001$) and lichen planus (LP) (p<.05) were increased in 2020, while molluscum contagiosum (MC) showed a two-fold decrease in the same year (p<.05) [Table 4].

Discussion

The most striking findings of this study were the 40% decline of the total number of adult and pediatric outpatients, a significant decrease of mean duration of complaints, remarkable elevation of the hand, the face and the scalp involvements, an increased rate of application of

Table 1: Some demographic features of G1 and G2 groups

	G1 (2019) n=4434 n (%)	G2 (2020) n=2839 n (%)	OR (95% CI)	*p* value
Age				
Range	0-94	0-97		
Mean±Standart deviation	34.9±18.42	33.8±18.06		
Gender				
Female	2512 (56.5)	1640 (57.7)	1.05	.30
Male	1932 (43.5)	1199 (42.3)	(0.95-1.15)	
Age				
<18 years	807	537	1.04	.46
≥18 years	3627	2302	(0.92-1.18)	
Duration of lesions	1 day-608.3 months	1 day-420 months		<0.001
Mean (Day)	94.2	64.2		
Location				
1 area	3433 (77.3)	2193 (77.2)	0.99	.98
≥2 areas	1011 (22.7)	646 (22.7)	(0.89-1.11)	
Most common anatomic region*	Face, 971 (21.8)	Face, 715 (25.1)		
	Foot, 319 (7.1)	Scalp, 219 (7.7)		
	Trunk, 283 (6.3)	Foot, 176 (6.1)		
	Scalp, 281 (6.3)	Trunk, 164 (5.7)		
	Leg, 263 (5.9)	Hand, 161 (5.6)	*	*

*Since the frequencies of anatomic regions differed from each year, *p* values were noted in the results section.

Table 2: Comparison of age subgroups between two years

Age Group (year)	2019		2020	
	Female n (%)	Male n (%)	Female n (%)	Male n (%)
≤ 1	22 (0.9)*	26 (1.3)	27 (1.7)*	19 (1.6)
2–5	88 (3.5)	90 (4.7)	56 (3.4)	60 (4.9)
6–17	304 (12.1)	277 (14.4)	203 (12.5)	172 (14.2)
≥18	2091 (83.5)	1536 (79.6)	1338 (82.4)	964 (79.3)
Total**	2505 (56.5)	1929 (%43.5)	1624 (57.2)	1215 (42.8)

*: $p<.05$, **: $p>.05$

contact dermatitis, psoriasis and LP, whereas a decline of MC after Covid-19 outbreak.

Previous studies evaluating effect of Covid-19 pandemic on dermatology referrals have been designed as periods for 1 or 4 months after pandemic,[7,8] or compared right before and after 2 months of outbreak.[9] Only, one previous study compared the two corresponding periods (April and May) of 2019 and 2020.[10] In our study, by including the two identical time frame of the year and also a longer period of time we aimed to make an objective comparison preventing seasonal, environmental or school term variations.

There was a significant decline in patient admissions of G2 group as expected. Besides patient concern for entry in the hospitals, some dermatology outpatient clinics provided limited service due to participation of dermatologists in the Covid-19 services. The fall of dermatology referral in our study was 40%, while similar studies showed dermatology outpatient applications decreased even more than 70% in the outbreak.[9,10] It is reasonable that the lockdown and, related fear and panic to an unknown infection might all have caused the most significant reduction of dermatology hospital referrals in the first months of the outbreak. Additionally, given that previous studies were organized in public and university tertiary hospitals, patients might have preferred private hospitals which constitutes our study environment, thinking that it may be safer and more preserved compared to more densely populated hospitals.

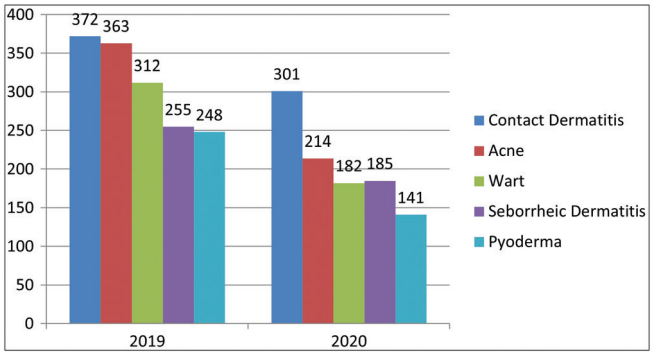

Figure 1: The most common five dermatoses in 2019 and 2020

Table 3: Comparison of the most common five dermatoses

	G2 (2020) *n* = 2839 n (%)	G1 (2019) *n* = 4434 n (%)	OR (95% CI)	*P*
Contact dermatitis	301 (10.6)	372 (8.3)	1.29 (1.10–1.51)	.0017
Acne	214 (7.5)	363 (8.1)	0.91 (0.76–1.09)	.33
Seborrheic dermatitis	185 (6.5)	255 (5.7)	1.14 (0.93–1.38)	.19
Wart	182 (6.4)	312 (7.0)	0.90 (0.74–1.09)	.32
Pyoderma	141 (4.9)	248 (5.5)	0.88 (0.71–1.09)	.26

Table 4: Evaluation of selected dermatoses in G1 and G2 groups

	G2 (2020) n=2839 n (%)	G1 (2019) n=4434 n (%)	OR (95% CI)	*P*
Psoriasis	81 (2.85)	64 (1.44)	2.00 (1.43-2.79)	<.001
Lichen planus	27 (0.95)	22 (0.49)	1.92 (1.09-3.38)	.03
Pityriasis rosea	31 (1.09)	34 (0.76)	1.42 (0.87-2.32)	.19
Urticaria	67 (2.35)	88 (1.98)	1.19 (0.86-1.64)	.31
Rosacea	52 (1.83)	81 (1.82)	1.00 (0.70-1.42)	.94
Vitiligo	29 (1.02)	28 (0.63)	1.62 (0.96-2.73)	.08
Erythema multiforme	7 (0.24)	11 (0.24)	0.99 (0.38-2.56)	.81
Herpes zoster	37 (1.3)	54 (1.21)	1.07 (0.70-1.63)	.83
MC[ŧ]	13 (0.45)	41 (0.92)	0.49 (0.26-0.92)	.03
AA[ŧ]	46 (1.62)	49 (1.10)	1.47 (0.98-2.21)	.07
TE[§]	38 (1.33)	48 (1.08)	1.23 (0.80-1.89)	.39

[ŧ]MC: Molluscum contagiosum, [ŧ]AA: Alopecia areata, [§]TE: Telogen effluvium

There was no statistically significant difference in all patients in G1 and G2 groups in terms of gender. However, interestingly, in 2020, we found a significant increase in dermatology outpatient admissions of girls at under the age of 1 year compared to the previous year [Table 2]. On the other hand, the number of boys admitted in the same age group did not reveal any difference. This finding was not mentioned in the previous studies, but we think it could be a coincidental finding since we are not aware of any rational cause and the patients in this age group are few.

In 2019, patients applied to the hospital 3 months after their complaints started while this period was 2 months after the pandemic. This finding is valid not only for dermatology clinics but also for other disciplines. It is known that many patients with chronic diseases hesitated to apply to a hospital during pandemic, but rather for acute and decompensated diseases.[1]

Acıbadem Health Group owns a number of private hospitals some of them affiliated with Acıbadem University, School of Medicine. Government insurance is only partially complementary in only one of the hospitals that the study was conducted. So, we think the patient population is different from other studies which were recruited from public university and public hospitals. We interpret the increased frequency of infestations (scabies)[10] and superficial fungal infections[9,10] in public hospitals due to the difference in the mentioned patient population.

Contact dermatitis has been reported repeatedly as an increased dermatosis after Covid-19 outbreak.[9,10] This is a predictable outcome particularly for hands and face, since frequent hand washing and the excessive use of sanitizers in addition to face masks.[3,6,11] Contact dermatitis was the most common dermatological problem both before and after pandemic in our study. The prevalence (8.3% in G1 vs. 10.6% in G2) significantly increased in 2020. Interestingly, hand was not within the first five anatomic location before pandemic, although we found it was among the most common five area after pandemic [Table 1]. Similarly, face was the most common anatomic location for each group (G1 and G2) and there was a significant rise in 2020. Face may be involved in both acne and contact dermatitis. Nevertheless, it is possible that these findings might be indirect clues for contact dermatitis localized mostly to hands and face.

A study from Turkey showed that acne and acneiform eruptions (88.8%) were the most common diseases after pandemic for referral to outpatient clinics.[12] Similar results were supported by others.[7,8] Kutlu and Metin[10] found a significant increase in acne in the second month of the outbreak compared to the previous year. Our results showed acne was still the second most frequent disorder after outbreak compared to the previous year without statistical significance. Similarly, a study comparing 2-month periods before and after the pandemic, authors observed that acne was the second common dermatosis with similar rates before and after pandemic.[9] Given that patients did not apply to the hospital even for many serious diseases,[1] it could be proposed that applications for non-urgent dermatosis such as acne frequency would decrease with the pandemic. Contrary to expectations, acne frequency did not change compared to previous year. This might be due to increase in acne severity that led an increased hospital referral or due to a new term "maskne" which is described as acneiform eruption because of excessive mask usage.[5]

With Covid-19 pandemic, human beings encountered a new unknown virus. Restriction of daily routines, fear of transmission, lockdowns and lifestyle changes might all have facilitated possible stress-induced or stress-related disorders. Given that some inflammatory, hair and pigmentation diseases might increase with stress, and some might be subtle skin findings of Covid-19 infection, it is reasonable to compare G1 and G2 groups according to some selected dermatoses. We found psoriasis and LP were increased about 2-fold after the outbreak [Table 4], although an induction of LP after vaccine[13] and psoriasis flare-up[10] were reported.

Pityriasis rosea and urticaria have been reported to be increased after outbreak.[9,10] In contrast, we found no difference in these two dermatoses between G1 and G2 groups, although these entities were also reported to be a cutaneous finding of Covid-19 infection[11] and well-known stress-induced dermatoses.

We also evaluated the effect of Covid-19 outbreak on some infectious and reactive diseases. Presumably, herpes zoster might become more frequent due to stress and Covid-19 infection, however, there were no significant increase. Similarly, erythema multiforme as a reactive dermatosis of mostly Herpes simplex virus and of rarely Covid-19 infection[11] did not show any difference between the two groups. However, MC showed a 2-fold decline in 2020 (G2 group). This finding has also been mentioned before.[10] We think the lockdown, school and swimming pool closures and rules of social distance in Turkey might have contributed to the reduced incidence of MC known to be transmitted by direct contact.

We also questioned for vitiligo and hair disorders including alopecia areata (AA) and telogen effluvium (TE) which stress might have a role in the etiology and found no statistical significance. However, Kutlu and Metin[10] reported that referral of AA and TE were more frequent after pandemic whereas Kartal *et al.*[9] found a decline in TE and any change in AA. Considering a stressful event may show its effect after weeks or months in hair and pigmentation disorders, longer periods might be required for more valuable conclusions.

There are many limitations in our study. A higher number of patients for definitive interpretations might have yielded more objective results. We did not evaluate acne duration (starting after pandemic or not), changes in acne severity with outbreak,[5] association of mask usage and location of acne (involvement of mask areas).[5] In addition, we might miss hand and facial contact dermatitis which were increased areas after outbreak due to hand protective measures and masks, respectively,[2,3] since we have no detailed data about the location of contact dermatitis. On the other hand, considering the likelihood of the effects that some entities such as TE, pigmentation and nail diseases appear later, it is possible that longer periods more than 6 months can provide more objective results demonstrating post-covid or stress induced effects.

In conclusion, this study revealed some remarkable findings about the short-term impact of Covid-19 pandemic. To our knowledge, this is the first study design comparing the identical periods before and after Covid-19 outbreak and providing more reliable data, although it has some limitations as mentioned above. This study has also some distinctive features as a study design in a private hospital group, effect of pandemic on some infectious, inflammatory and hair disorders as well. Further studies will verify whether the pandemic might have more variable effects about dermatology practices in the long-term period.

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Conflicts of interest

There are no conflicts of interest.

References

1. Sabetkish N, Rahmani A. The overall impact of Covid-19on healthcare during the pandemic: A multidisciplinary point of view. Health Sci Rep 2021;4:e386.
2. Kang SY, Chung BY, Kim JC, Park CW, Kim HO. Clinical manifestations and patch test results for facial dermatitis associated with disposable face mask use during the COVID-19 outbreak: A case-control study. J Am Acad Dermatol 2021;85:719-21.
3. Montero-Vilchez T, Cuenca-Barrales C, Martinez-Lopez A, Molina-Leyva A, Arias-Santiago S. Skin adverse events related to personal protective equipment: A systematic review and meta-analysis. J Eur Acad Dermatol Venereol 2021;35:1994-2006.
4. Chaiyabutr C, Sukakul T, Pruksaeakanan C, Thumrongtharadol J, Boonchai W. Adverse skin reactions following different types of mask usage during the COVID-19 pandemic. J Eur Acad Dermatol Venereol 2021;35:e176-8.
5. Damiani G, Gironi LC, Grada A, Kridin K, Finelli R, Buja A, *et al*. COVID-19 related masks increase severity of both acne (maskne) and rosacea (mask rosacea): Multi-center, real-life, telemedical, and observational prospective study. Dermatol Ther 2021;34:e14848.
6. Darlenski R, Tsankov N. COVID-19 pandemic and the skin: What should dermatologists know? Clin Dermatol 2020;38:785-7.
7. Çaytemel C, Erdem O, Ağırgöl Ş, Türkoğlu Z. Dermatology outpatient clinic outcomes after COVID-19 outbreak: What is new normal? Dermatol Ther 2021;34:e14950.
8. Altun E. The most common pediatric and adult dermatology patient complaints in a month of the COVID-19 pandemic in Turkey. Dermatol Ther 2020;33:e13972.
9. Kartal SP, Çelik G, Sendur N, Aytekin S, Serdaroğlu S, Doğan B, *et al*. Multicenter study evaluating the impact of COVID-19 outbreak on dermatology outpatients in Turkey. Dermatol Ther 2020;33:e14485.
10. Kutlu Ö, Metin A. Relative changes in the pattern of diseases presenting in dermatology outpatient clinic in the era of the COVID-19 pandemic. Dermatol Ther 2020;33:e14096.
11. Mawhirt SL, Frankel D, Diaz AM. Cutaneous manifestations in adult patients with COVID-19 and dermatologic conditions related to the COVID-19 pandemic in health care workers. Curr Allergy Asthma Rep 2020;20:75.
12. Ustaoglu E. The impact of COVID-19 pandemic in dermatology outpatient clinics in Turkey: A survey study. J Cosmet Dermatol 2021;20:2382-6.
13. Merhy R, Sarkis AS, Kaikati J, El Khoury L, Ghosn S, Stephan F. New-onset cutaneous lichen planus triggered by COVID-19 vaccination. J Eur Acad Dermatol Venereol 2021;35:e729-30.