

ORIGINAL ARTICLE

Dermatological diseases presented before COVID-19: Are patients with psoriasis and superficial fungal infections more vulnerable to the COVID-19?

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Abstract

Recent studies have focused on the comorbid conditions of the COVID-19. According to the current studies, numerous diseases including lung disease, cardiovascular disease and immunosuppression appear to be at higher risk for severe forms of the COVID-19. To date, there are no data in the literature on the comorbid dermatological diseases and COVID-19. We tried to analyze the previous dermatological comorbidity of 93 patients with COVID-19 (51 males, 42 females) who presented to the dermatology outpatient clinics for the last 3 years. The most common dermatologic diseases in patients with COVID-19 who have dermatologic diseases for the last 3 years were superficial fungal infections (24, 25.8%), seborrheic dermatitis (11, 11.8%), actinic keratosis (10, 10.8%), psoriasis (6, 6.5%), and eczema (6, 6.5%), respectively. In addition, the number of COVID-19 patients who presented to dermatology in the last 3 months was 17 (11 men, 6 women). The median age of these patients was 58 (minimum 18, maximum 80) years, and the most common dermatologic diseases before diagnosed COVID-19 were superficial fungal infections (5, 25%), psoriasis (4, 20%), and viral skin diseases (3, 15%). The possible similarity between cutaneous and mucosal immunity and immunosuppression suggests that patients with some dermatologic diseases especially superficial fungal infections and psoriasis may be more vulnerable to the COVID-19.

KEYWORDS

COVID-19, dermatology, immunosuppression, psoriasis, SARS-CoV-2, superficial fungal infections

1 | INTRODUCTION

A novel coronavirus, SARS-CoV-2, emerged from China causes COVID-19, which is quickly spread throughout the world.¹ The pandemic has been spreading to Turkey since March 11, 2020. The number of COVID-19 cases in Turkey is increasing by more than 4000 new cases a day and reached 47 029, on April 10, 2020.² Among patients with COVID-19, some of them presented to the dermatology outpatient clinic before and during the pandemic. Recent studies have focused on the comorbid conditions of the

COVID-19. According to the current studies, numerous diseases including lung disease, cardiovascular disease and immunosuppression appear to be at higher risk for severe forms of the COVID-19.³ In this regard, the study from Wuhan, China reported that 140 patients who were admitted to the hospital with COVID-19, in which 30% had hypertension and 12% had diabetes mellitus as comorbid diseases.⁴ To date, there are no data in the literature on the comorbid dermatologic diseases and COVID-19. We aimed to investigate the possible relationship between comorbid dermatological diseases and COVID-19.

2 | MATERIALS AND METHODS

This study was carried out retrospectively by analyzing previous dermatological comorbidity of 93 patients with COVID-19 who have presented to dermatology outpatient clinic, Uşak Training and Research Hospital, in Turkey for the last 3 years.

Patients were divided into three groups: patients who presented to the dermatology outpatient clinic in the last 3 months, 1 year, and 3 years before diagnosed with COVID-19. The most common dermatologic diseases of these groups were examined.

The data were analyzed using SPSS 20.0 (SPSS Inc., Chicago, Illinois) program. Descriptive statistics are given by giving frequency and percentages. While numerical changes are shown as mean \pm SD in a

normal distribution, the median value is used in cases without normal distribution.

3 | RESULTS

A total of 93 COVID-19 patients were included in this study, with 51 males and 42 females. The mean age of the patients was 55.28 ± 19.32 years (Table 1). The number of patients in intensive care was six and four of them became exitus.

The most common dermatologic diseases in patients with COVID-19 who have dermatologic diseases for the last 3 years were superficial fungal infections (24, 25.8%), seborrheic dermatitis (11, 11.8%), actinic keratosis (10, 10.8%), psoriasis (6, 6.5%), and eczema (6, 6.5%), respectively.

A total of 52 patients with COVID-19 were seen for dermatologic diseases in the last year. The most common dermatologic diseases were superficial fungal infections (11, 21.2%), seborrheic dermatitis (7, 13.5%), actinic keratosis (6, 11.5%), psoriasis (5, 9.6%), herpes simplex (3, 5.8%), and eczema (3, 5.8%), respectively.

The number of COVID-19 patients who presented to dermatology outpatient clinic for the last 3 months was 17 (11 men, 6 women). The median age of these patients was 58 (minimum 18, maximum 80) years. The most common diseases were superficial fungal infections (5, 25%), psoriasis (4, 20%), and viral skin diseases (3, 15%). The clinical and demographic characteristics of the COVID-19 patients who presented to the dermatology clinic for the last 3 months are summarized in Table 2.

TABLE 1 The age of COVID-19 patients who presented to dermatology outpatient clinic for the last 3 years

Diagnosis	Age		
	Minimum	Maximum	Median
Superficial fungal infections	27	83	66
Seborrheic dermatitis	17	75	47
Actinic keratosis	60	90	75.5
Psoriasis	31	71	58.5
Herpes simplex	18	81	54
Eczema	35	87	54

TABLE 2 The clinical and demographic characteristics of the COVID-19 patients who presented to the dermatology outpatient clinic in the last 3 months

Number	Age	Gender	Diagnosis	Current position
1 ^a	35	M	Contact dermatitis	Discharged
2	79	W	Actinic keratosis	Exitus
3	30	M	Anogenital warts	Discharged
4	18	M	Herpes simplex	Discharged
5	28	M	Ichthyosis vulgaris	Discharged
6	58	M	Contact dermatitis	Exitus
7	70	M	Xerosis cutis	Discharged
8	59	M	Molluscum contagiosum	Discharged
9 ^b	47	W	Psoriasis	Admitted
10 ^b	58	M	Psoriasis/tinea cruris	Discharged
11	60	W	Psoriasis/tinea corporis	Discharged
12	71	M	Psoriasis	Discharged
13	68	W	Seborrheic dermatitis/actinic keratosis	Discharged
14	40	W	Cellulitis	Discharged
15	62	M	Tinea unguinum	Admitted
16	80	W	Tinea cruris	Exitus
17	27	M	Tinea unguinum	Discharged

Abbreviations: M, man; W, woman.

^aThe patient received intramuscular steroid 1 month before diagnosed with COVID-19.

^bPatients had been receiving methotrexate.

4 | DISCUSSION

This is the first report and perspective of concomitant dermatologic diseases before diagnosed COVID-19. According to our study, superficial fungal infections, psoriasis, seborrheic dermatitis, actinic keratosis, and herpes simplex are the most common dermatologic diseases before COVID-19 infection. Older adults who have at greater risk for COVID-19 can be as a possible predisposing factor for some of the current dermatologic diseases such as actinic keratosis.⁵ In our study, psoriasis was among more common dermatological diseases in patients with COVID-19, especially for the last 3 months. The stress burden caused by the COVID-19 pandemic in patients with psoriasis might lead to an increase the number of visits of these patients to dermatology outpatient clinics in the last 3 months.⁶ The use of immunosuppressive drugs may also have been related to the greater number of psoriasis which is present in patients with COVID-19. In this context, two of our patients were under methotrexate treatment when infected with a novel coronavirus. While one of these two patients was discharged, the other continues to be hospitalized without intensive care. Furthermore, it can be speculated that the long-term widespread use of potent topical corticosteroids may also contribute to increased vulnerability to the COVID-19, given other COVID-19 patients with psoriasis and eczema. These findings indicate that not only biological agents but also topical and conventional immunosuppressive treatments may cause the predisposition to COVID-19 during the pandemic.^{7,8} In this regard, one of the treatment strategies of moderate-to-severe psoriasis may be to extend the immunosuppressive treatment during a COVID-19 pandemic.

The similarity between cutaneous and mucosal immunity suggests that decreased cutaneous immunity may indicate decreased mucosal immunity.^{9,10} SARS-CoV-2 makes infection via pass through nasal mucosa by using angiotensin-converting enzyme 2 receptor which is found in the basal layer of the nonkeratinizing squamous epithelium.¹¹ The previous studies revealed that the power of the mucosal innate and adaptive immune systems which contains CD4+ T-helper cells, Th17, high-avidity CD8+ CTL, and secretory IgA and IgG1 neutralizing antibodies may prevent viral spreading into the nasal mucosa. These suggestions allow knowing the importance of mucosal immunity on the SARS-CoV-2.^{12,13} Of note, the previous animal study reported that Th1 and Th17 immune responses including IL-17A and IFN- γ , which are also important factors to prevent viral damage in the nasal mucosa, are individually unnecessary but together contribute to the optimal healing of superficial fungal infections.¹⁴ Therefore, it can be concluded that patients with a superficial fungal infection may have decreased cutaneous immunity as well as mucosal immunity. This may be one of the explanations of why a patient with superficial fungal infections may indicate to be more prone to COVID-19 infections. The determination of the relationship between cutaneous and mucosal immunity may lead to developing a preventive treatment approach strategy in patients with immune-related skin diseases in COVID-19

and possibly other viral pandemics.¹⁵ The herpes simplex, which is another common disease in patients, with COVID-19 can also be considered in this regard. Therefore, zinc that is used to prevent recurrent herpes simplex by stimulating the presence of antiviral interferon IFN- α and IFN- γ may reduce the contamination of COVID-19.^{16,17} Further studies should be conducted to illuminate the appropriate approach to the COVID-19. Lastly, according to our study, seborrheic dermatitis was another common skin disease among patients with COVID-19. The possible etiological factors of seborrheic dermatitis such as an increased number of *Malassezia* species and decreased serum zinc levels in these patients may also play an important role in the contamination of COVID-19.^{18,19}

The possible similarity between cutaneous and mucosal immunity and immunosuppression suggests that patients with certain dermatologic diseases especially superficial fungal infections and psoriasis may be more vulnerable to the COVID-19. Randomized controlled trials and large population studies should be conducted to evaluate these findings.

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