

## CLINICAL PROFILE OF OUTPATIENTS ATTENDING DERMATOLOGY DEPARTMENT DURING COVID-19 LOCKDOWN RELAXATION PERIOD IN A TERTIARY CARE CENTRE IN SOUTH INDIA – A CROSS-SECTIONAL ANALYTICAL STUDY

### Dermatology

|                                  |                                                                                                                                                                           |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dr. Afthab Jameela Wahab*</b> | MD (Dermatology), DD Professor of Dermatology, Department of Dermatology, Venereology and Leprosy, A.C.S. Medical College and Hospital, Chennai.<br>*Corresponding Author |
| <b>Dr. Pavithra Gunasekaran</b>  | MD DVL, Senior resident, Department of Dermatology, Venereology and Leprosy, A.C.S. Medical College and Hospital, Chennai                                                 |
| <b>Dr. P. Mohan</b>              | MD (Venereology), DV, Associate Professor, Department of Dermatology, Venereology and Leprosy, A.C.S. Medical College and Hospital, Chennai.                              |
| <b>Dr. V. Sudha</b>              | MD (Venereology), DV, DD, Professor and HOD, Department of Dermatology, Venereology and Leprosy, A.C.S. Medical College and Hospital, Chennai.                            |
| <b>Dr. L. Balamurugan</b>        | MD DVL, Assistant Professor, Department of Dermatology, Venereology and Leprosy, A.C.S. Medical College and Hospital, Chennai.                                            |
| <b>Dr. P. Revathi Guru</b>       | DDVL, Senior resident, Department of Dermatology, Venereology and Leprosy, A.C.S. Medical College and Hospital, Chennai.                                                  |

### ABSTRACT

**Background** - The cutaneous manifestations of the novel coronavirus have been well documented. However, there are few studies that relate to the clinical profile of regular dermatology outpatients seeking treatment during the lockdown relaxation period braving the pandemic. **Aim** - With the view to determine the changes seen in dermatology outpatient practice, this study analysed the clinical profile of new patients attending the Dermatology Outpatient Department (OPD) during the COVID-19 lockdown relaxation period in a tertiary care centre in a metropolitan suburb in South India. **Method** - New dermatology outpatients during the months of May, June, July and August 2020 were included in the study. Outpatient data for this period was analysed and compared with corresponding data for the same period in the previous two years. **Result** - There was a decrease in the OP census, number of patients in the extremes of life as well as those with asymptomatic dermatoses. There was an increase in the number of patients with infections, particularly dermatophytosis. There was also a noteworthy absence of dermatological emergencies. **Conclusion** - In essence, our study shows the impact of COVID-19 pandemic on the routine dermatology outpatient services with significant changes in the clinical profile of outpatient practice following lockdown relaxation.

### KEYWORDS

COVID-19, lockdown, dermatology outpatient practice

### INTRODUCTION

The COVID-19 pandemic significantly altered the dynamics of health care systems. Worldwide lockdown was imposed by governments to control the pandemic. Faculty and residents were deputed to, and inpatient wards were diverted for, COVID patient care. In May 2020, lockdown was relaxed amidst restrictions in containment zones. Dermatology outpatient service resumed as per guidelines laid down by dermatology associations. Cutaneous manifestations associated with the novel coronavirus have been well documented in many studies. Comparatively less studies relate to regular skin conditions for which outpatients visited the Dermatology department during the partial lockdown relaxation period, braving the pandemic. This study analysed the clinical profile of outpatients seeking treatment for dermatoses during this period at a tertiary care hospital in a metropolitan suburb in South India, with the view to determine the changes seen in outpatient practice.

### AIM OF STUDY

1. To study the age and sex distribution of new patients attending the Dermatology outpatient department (OPD) during the COVID-19 lockdown relaxation period in a tertiary care centre in a metropolitan suburb in South India.
2. To study the clinical profile of new patients with dermatological diseases seen in the Dermatology OPD during the period.
3. To compare the findings thus obtained with data from the corresponding period in the previous two years.

### Type Of Study

Retrospective cross-sectional observational study from the outpatient data for the months of May, June, July and August of 2018, 2019 and 2020 at a suburban tertiary care centre.

### MATERIALS AND METHODS

All new patients attending the Dermatology OPD during the COVID-19 pandemic lockdown relaxation period in the months of May, June,

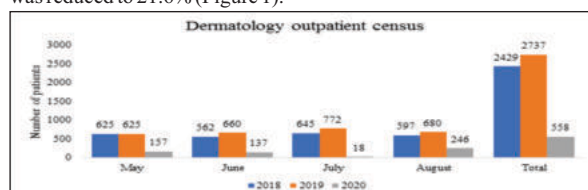
July and August 2020 at a suburban tertiary care centre were included in the study. The study excluded COVID-19 patients, health-workers or those with personal protective equipment (PPE) or hand hygiene related dermatoses. Data regarding their age and sex distribution, clinical profile and distribution of their dermatological conditions was analysed and compared with corresponding data for the same period in the previous two years. All dermatoses clinically diagnosed were recorded and classified into 14 major categories: - infections and infestations, inflammatory, neonatal/ pregnancy-related, vascular, papulosquamous, autoimmune, pigmentary, keratinization, nutritional/ metabolic/ depository, nail and hair disorders, tumours/ cysts, naevi and miscellaneous.

### Statistical Analysis

The data was entered in OpenEpi software. The statistical analysis was performed using Chi-square test by 2 x 2 table to evaluate the *p* value. *P* < 0.05 was accepted as statistically significant.

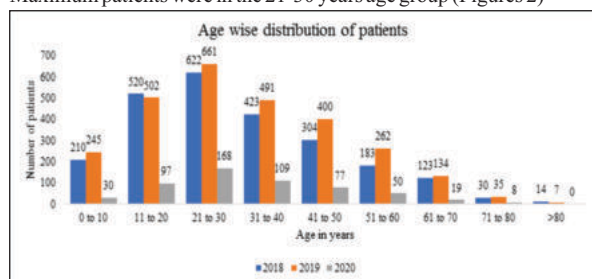
### RESULTS

During the months of May, June, July and August in 2018, 2019 and 2020, a total of 2429, 2737 and 558 new patients diagnosed respectively with 2555, 2975 and 622 dermatoses presented at the Dermatology OPD. The census during the lockdown relaxation period was reduced to 21.6% (Figure 1).



**Figure 1** – Census of new patients in Dermatology OPD during COVID-19 lockdown relaxation period 2020, compared with the previous 2 years

Maximum patients were in the 21-30 years age group (Figures 2)



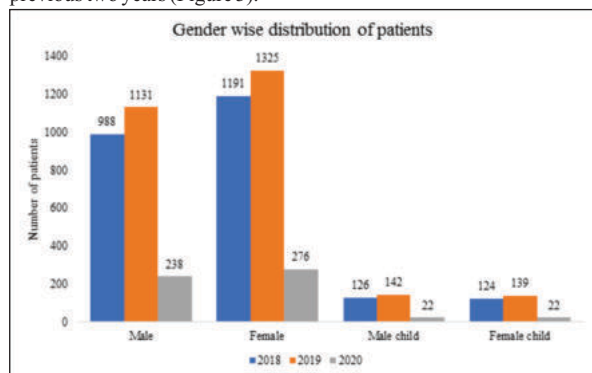
**Figure 2** – Age distribution of patients during COVID-19 lockdown relaxation period 2020, compared with the previous 2 years

The predominant age of outpatients was 21-30 years in all three years; however, their percentage in 2020 was statistically more significant than in the previous two years (Table 1). Majority of patients were in the 21-40 years age group as against 11-30 years during the previous two years and the percentage of patients under 10 years was 5.38%, much lesser than in 2018 (8.65%) and 2019 (8.95%); these findings were statistically significant. There was a decrease in the percentage of patients over 60 years in 2020 (4.84%) compared with 2018 (6.88%) and 2019 (6.43%), though not statistically significant. There were eight patients in the 71-80 age group (30 in 2018 and 35 in 2019) and no patients aged over 80 (14 in 2018, 7 in 2019).

**Table 1 - Statistical Analysis Of Age Wise Census**

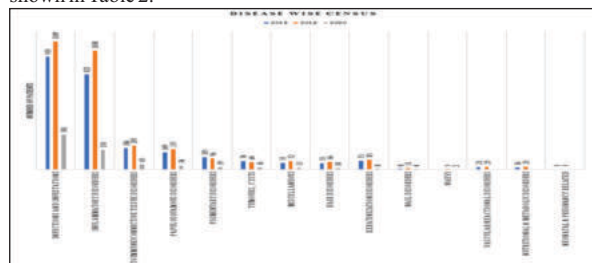
| Age in years | 2018 vs 2020  | 2019 vs 2020  |
|--------------|---------------|---------------|
|              | p – value     | p – value     |
| 0-10         | 0.005104(P)   | 0.002426(P)   |
| 11-20        | 0.01854(P)    | 0.3200(P)     |
| 21-30        | 0.01771       | 0.002098      |
| 31-40        | 0.132         | 0.1397        |
| 41-50        | 0.4378        | 0.01696       |
| 51-60        | <0.0000001(P) | <0.0000001(P) |
| 61-70        | 0.04450(P)    | 0.08930(P)    |
| >71          | 0.3428(P)     | 0.5214(P)     |

Among adults, female patients outnumbered males in all three years. In 2020, male children equalled female children but exceeded during the previous two years (Figure 3).



**Figure 3** – Gender distribution of new patients during COVID-19 lockdown relaxation period 2020, compared with the previous 2 years.

Disease-wise census during COVID-19 lockdown relaxation period 2020, compared with the previous 2 years is depicted in Figure 4 and shown in Table 2.



**Figure 4** – Disease-wise census during COVID-19 lockdown relaxation period 2020, compared with the previous 2 years

Infections, infestations, arthropod bites and inflammatory dermatoses constituted the major bulk (75.72%) in 2020 (2018-70.67%, 2019-71.89%).

**Table 2 – Disease-wise Census During COVID-19 Lockdown Relaxation Period 2020, Compared With The Previous 2 Years**

| Categories of dermatoses               | 2018                | 2019                | 2020                | 2018 vs 2020 | 2019 vs 2020 |
|----------------------------------------|---------------------|---------------------|---------------------|--------------|--------------|
|                                        | Number (% of total) | Number (% of total) | Number (% of total) | p - value    | p - value    |
| Infections and Infestations            | 979(38.31)          | 1109(37.27)         | 301(48.39)          | 0.000003065  | 0.00000019   |
| Inflammatory disorders                 | 827(32.36)          | 1030(34.62)         | 170(27.33)          | 0.008242     | 0.0002299    |
| Autoimmune/connective tissue disorders | 186(7.27)           | 207(6.25)           | 45(7.23)            | 0.5248(P)    | 0.5248(P)    |
| Papulosquamous disorders               | 149(5.83)           | 177(5.00)           | 34(5.46)            | 0.4057(P)    | 0.3606(P)    |
| Pigmentary disorders                   | 105(4.10)           | 96(3.52)            | 19(3.05)            | 0.1338(P)    | 0.4717(P)    |
| Tumours, cysts                         | 74(2.89)            | 64(2.48)            | 16(2.57)            | 0.3906(P)    | 0.3011       |
| Miscellaneous                          | 57(2.23)            | 72(1.91)            | 13(2.09)            | 0.4870(P)    | 0.4933(P)    |
| Hair disorders                         | 55(2.15)            | 66(1.84)            | 10(1.60)            | 0.2461(P)    | 0.2122(P)    |
| Keratinization disorders               | 75(2.93)            | 85(2.52)            | 8(0.8)              | 0.01052(P)   | 0.01261(P)   |
| Nail disorders                         | 8(0.31)             | 11(0.26)            | 4(0.64)             | 0.194        | 0.2528       |
| Naevi                                  | -                   | 5(0.17)             | 2(0.32)             | -            | 0.3478       |
| Vascular/reactional disorders          | 21(0.82)            | 25(0.70)            | -                   | -            | -            |
| Nutritional & metabolic disorders      | 16(0.62)            | 25(0.53)            | -                   | -            | -            |
| Neonatal & pregnancy related           | 3(0.11)             | 3(0.10)             | -                   | -            | -            |
| Total                                  | 2555                | 2975                | 622                 |              |              |

The total patients with infections and infestations (48.39%) were statistically more significant than in the previous two years (38.31% in 2018, 37.27% in 2019) (Table 3). Bacterial and viral infections, infestations and arthropod bites were lesser, sexually transmitted infections were similar to, fungal infections were more than those seen during the previous two years.

**Table 3 - Infections And Infestations Types During COVID-19 Lockdown Relaxation Period 2020, Compared With The Previous 2 Years**

| Infections and Infestations | 2018                           | 2019                           | 2020                           | 2018 vs 2020 | 2019 vs 2020 |
|-----------------------------|--------------------------------|--------------------------------|--------------------------------|--------------|--------------|
| Types                       | Number (% of total infections) | Number (% of total infections) | Number (% of total infections) | p - value    | p - value    |
| Bacterial                   | 140(14.30)                     | 194(17.49)                     | 35(11.62)                      | 0.4743       | 0.2320(P)    |
| Viral                       | 130(13.27)                     | 143(12.89)                     | 15(4.98)                       | 0.001680(P)  | 0.003529(P)  |
| Verruca                     | 70(7.15)                       | 77(6.94)                       | 6(1.99)                        | 0.003970(P)  | 0.006359(P)  |
| STI                         | 34(3.47)                       | 55(4.95)                       | 13(4.31)                       | 0.1135       | 0.3929       |
| Fungal                      | 478(48.82)                     | 482(43.46)                     | 201(66.77)                     | <0.0000001   | <0.0000001   |

|                                               |                  |                  |                 |            |            |
|-----------------------------------------------|------------------|------------------|-----------------|------------|------------|
| Dermatophytosis                               | 375(38.30)       | 398(35.88)       | 175(28.13)      | <0.000001  | <0.000001  |
| Infestations                                  | 114 (11.64)      | 112 (10.09)      | 19 (6.31)       | 0.06843(P) | 0.2324(P)  |
| Arthropod bites                               | 83 (8.47)        | 123 (11.09)      | 18 (5.98)       | 0.3812(P)  | 0.08729(P) |
| Sum / total number of dermatoses (% of total) | 979/2555 (38.31) | 1109/2975 (37.2) | 301/622 (48.39) |            |            |

**Table 4 – Infections And Infestations Seen In 2018, 2019 And 2020**

| INFECTIONS                                 | 2018       | 2019       | 2020       |
|--------------------------------------------|------------|------------|------------|
| <b>BACTERIAL</b>                           |            |            |            |
| Cellulitis                                 | 10(1.02)   | 18(1.62)   | 3(0.99)    |
| Dermatitis cruris pustulosa et atrophicans | 3(0.30)    | 1(0.09)    | 3(0.99)    |
| Ecthyma                                    | 1          |            |            |
| Erythrasma                                 | 12(1.22)   | 7(0.63)    | 2(0.66)    |
| Folliculitis                               | 18(1.83)   | 22(1.98)   | 4(1.32)    |
| Furunculosis                               | 42(4.29)   | 92(8.29)   | 13(4.31)   |
| Impetigo                                   | 31(3.16)   | 29(2.61)   | 5(1.66)    |
| Keratolysis punctata                       | 8          | 2          |            |
| Lymphangitis                               |            | 2          |            |
| Perianal dermatitis                        | 1          | 3          |            |
| Pyoderma                                   | 7          | 10(0.90)   | 2(0.66)    |
| Trichomycosis axillaris                    |            | 1          |            |
| Leprosy                                    | 7          | 7(0.63)    | 3(0.99)    |
| <b>FUNGAL</b>                              |            |            |            |
| Candidiasis                                | 1          | 2          |            |
| Dermatophytosis                            | 375(38.30) | 398(35.88) | 175(58.13) |
| Onychomycosis                              | 21         | 12         |            |
| Pityriasis versicolor                      | 81(8.27)   | 70(6.31)   | 26(8.63)   |
| <b>ARTHROPOD BITES</b>                     |            |            |            |
| Insect bite allergy                        | 66(6.74)   | 121(10.91) | 13(4.31)   |
| Paederus dermatitis                        | 17(1.73)   | 2(0.18)    | 5(1.66)    |
| <b>VIRAL</b>                               |            |            |            |
| Hand foot mouth disease                    | 9          | 5          |            |
| Herpes simplex                             | 16         | 6          |            |
| Herpes zoster                              | 18(1.83)   | 18(1.62)   | 5(1.66)    |
| Molluscum contagiosum                      | 2          | 2          |            |
| Pityriasis rosea                           | 8(0.81)    | 25(2.25)   | 4(1.32)    |
| Varicella                                  | 4          | 6          |            |
| Viral exanthem                             | 3          | 4          |            |
| Verruca                                    | 70(7.15)   | 77(6.94)   | 6(1.99)    |
| <b>STI</b>                                 |            |            |            |
| BPO                                        | 9          | 6          |            |
| Chancroid                                  | 2          |            |            |
| Genital herpes                             | 4(0.40)    | 6(0.54)    | 2(0.66)    |
| Genital warts                              | 1          | 22         |            |
| Syphilis                                   |            | 2          |            |
| Vulvovaginitis                             | 18(1.83)   | 18(1.62)   | 6(1.99)    |
| <b>INFESTATIONS</b>                        |            |            |            |
| Demodicidosis                              | 1          | 1          |            |
| Pediculosis capitis                        | 29(2.96)   | 30(2.70)   | 3(0.99)    |
| Scabies                                    | 84(8.58)   | 81(7.30)   | 16(5.31)   |

The percentage of fungal infections was 66.77% in 2020, 48.82% in 2018 and 43.46% in 2019 (Table 4). There were 175 cases of dermatophytosis, mostly steroid modified. Dermatophytosis was usually extensive and affected more than one family member. Facial, particularly the ear pinnae involvement was common.

Among the 37 infestations and arthropod bites seen during the study period, sixteen had scabies (43.24%), and three (8.10%) had pediculosis capitis in 2020 (all within families), thirteen showed insect bite hypersensitivity and five had paederus dermatitis.

Inflammatory dermatoses constituted 27.33 % of total cases in 2020 - a statistically significant reduction when compared to 2018 (32.36%) and 2019 (34.62%) (Table 5).

**Table 5 - Inflammatory Disorders Seen During COVID-19 Lockdown Relaxation Period 2020 Compared With The Previous 2 Years**

| <b>Inflammatory disorders</b>   |                          |                          |                          |            |            |
|---------------------------------|--------------------------|--------------------------|--------------------------|------------|------------|
| Types                           | 2018                     | 2019                     | 2020                     | 2018vs2020 | 2019vs2020 |
|                                 | Number (%)<br>% of total | Number (%)<br>% of total | Number (%)<br>% of total | p – value  | p – value  |
| Eczemas                         | 345(41.71)<br>13.50%     | 398(38.64)<br>13.37%     | 68 (40)10.93%            | 0.04829(P) | 0.05437(P) |
| Frictional                      | 69 (8.34)2.70<br>%       | 78 (7.57)2.62<br>%       | 10 (5.88)1.60<br>%       | 0.07189(P) | 0.08436(P) |
| Photoinduced                    | 80 (9.67)3.13<br>%       | 75 (7.28)2.52<br>%       | 13 (7.64)2.09<br>%       | 0.1027(P)  | 0.3204(P)  |
| Follicular                      | 189(2.85)<br>7.39%       | 158 (15.33)5.3<br>1%     | 32(18.82)5.14%           | 0.02629(P) | 0.4798(P)  |
| Granulomatous                   | -                        | 5 (0.48)                 | -                        | -          | -          |
| Eccrine related                 | 132(15.96)<br>5.16%      | 303(29.41)<br>10.18%     | 45(26.47)7.23%           | 0.03015    | 0.01235(P) |
| Drug/exogenous                  | 12 (1.45)0.46<br>%       | 13 (1.26)0.43<br>%       | 2 (1.17)0.32%            | 0.4637(P)  | 0.5056(P)  |
| Total (% of total outpatient s) | 827/2555(32.36)          | 1030/2975 (34.62)        | 170/622 (27.33)          |            |            |

Majority of cases had eczema, in various stages, both exogenous and endogenous, acne and sweat related dermatoses. There were 11 cases of lichen simplex in 2020 compared to just 5 in 2018 and 10 in 2019.

All four patients who presented with nail disorders had painful conditions. Thirty- five cases of urticaria, eight pruritus, two vulval pruritus and three neuralgias/neuropathies (0.48%) (0.15% in 2018 and 0.26% in 2019) were seen. Six cases of diffuse hair loss including a case of telogen effluvium, two each of female pattern hair loss and premature canities were seen.

There were no neonatal or pregnancy related dermatoses, granulomatous, metabolic, nutritional, depository, vascular, reactional, psychosomatic dermatoses or rare syndromes among the patients during the study period in 2020.

## DISCUSSION

Skin manifestations are reported in 0.2 – 20.4% severe acute respiratory syndrome coronavirus 2 infection (SARS-CoV-2) patients<sup>1,7</sup>, due to direct infection, drugs or reactional, particularly in adults who rarely present with viral exanthems<sup>2,3</sup>. Morphological patterns include maculopapular, urticarial, vesicular, pseudo-chilblain and livedoid<sup>1</sup>. Long-time PPE usage and hand hygiene measures may cause eczema or exacerbation of pre-existing dermatoses<sup>4,5,8</sup>. Drugs may cause adverse reactions including Sweet syndrome, AGEP and DRESS<sup>6,7</sup>.

There are few studies relating to the impact of the pandemic on regular dermatology outpatient service and the clinical profile of patients who braved infection risk to seek dermatological services. This study ventured to assess this impact by noting the epidemiological and clinical profile of naïve dermatology outpatients in a tertiary care centre in a suburb of Chennai during the COVID lockdown relaxation period from May to August 2020 and comparing it with data for the same period in the previous two years. Statistical analysis was done using Chi-square test by Two x Two table to evaluate the *p* value. *P* < 0.05 was accepted as statistically significant.

Patients started visiting Dermatology OPD from 4.5.2020 after total lockdown was relaxed in the state. The number of new patients during the study period from May to August 2020 showed a marked decrease, comprising only 21.1% or one-fifth of the previous two years' mean census. The COVID-19 pandemic has affected the influx of patients at hospitals worldwide<sup>9</sup>. A study assessing COVID-19's impact on

dermatological practices in the United States showed over 50% decrease in predicted dermatology visits<sup>10</sup>.

Statistically significant higher number of patients in the 21-30 years age group in 2020 than the previous 2 years ( $p$  values - 0.01771 & 0.002098) indicates that this age group ventured out more during the pandemic. Majority of patients were in the 21-40 years age group ( $p$  values - <0.0000001 & <0.0000001) during this period compared with 11-30 years in the previous two years, similar to a study done in Rawalpindi (S. Shariff et al)<sup>12</sup>. There were lesser number of patients aged under 10 years ( $p$  values - 0.005104 & 0.002426) and over 60 years since the government advised restriction of movement of this demographic. A significant reduction of dermatoses requiring hospitalization was reported among children and the aged in a study from Poland<sup>11</sup>.

There was no difference in the gender distribution of patients in the three years; more female patients attended OP than males, observed in the study by S. Shariff et al, probably explained by the role of males as breadwinners<sup>12</sup>.

Infections and infestations topped the cause for patients seeking treatment ( $p$  values -0.000003065 & 0.00000019) during the pandemic followed by inflammatory dermatoses ( $p$  values - 0.008242 & 0.0002299) similar to the study done by S. Shariff et al<sup>12</sup>.

During the study period, outpatients mainly sought treatment for symptomatic dermatoses including symptomatic bacterial infections. There was a statistically significant decrease in viral infections ( $p$  values - 0.001680 & 0.003529), particularly asymptomatic viral warts ( $p$  values - 0.003970 & 0.006359). There was no change in the percentage of sexually transmitted infections.

The percentage of fungal infections was found to be significantly higher in 2020 than in 2018 and 2019, ( $p$  values - <0.0000001 & <0.0000001) with mostly cases of steroid modified dermatophytosis. Extensive dermatophytosis affecting multiple family members reflects the circumstances accompanying lockdown favouring spread amongst family members staying indoors. Majority gave history of using topical corticosteroid combinations obtained from local pharmacies during the lockdown period. Among this group facial involvement was common, particularly ear pinna involvement as reported by S. Verma and R. Madhu<sup>13</sup>. This may probably be related to the widespread use of mobile phones which may serve as fomites.

Scabies constituted the bulk of infestations with familial clustering, spread being facilitated by the lockdown 'stay home' setting.

Among inflammatory dermatoses, the number of patients with LSC was significantly higher ( $p$  values - 0.00002495 & 0.0002502), the stress of the lockdown may have contributed to the increased itch-scratch cycle effect.

There were a considerable number of patients with acne vulgaris, hyperpigmentation and hair loss. The ample 'stay-home' time available during the lockdown may have directed the patients to focus on their skin and hair and driven them to seek treatment for these aesthetic problems. This points to the negative effect of these diseases on the quality of life for patients to seek dermatology consultations during the relaxation of lockdown.

Pain and itching seem to be important as evidenced by patients with urticaria, pruritus, including vulval pruritus, neuralgias / neuropathies and acute painful nail disorders seeking expert care during the study period.

There was no change in the percentage of papulosquamous disorders, autoimmune/ connective tissue disorders, pigmentary disorders, tumours and cysts seen during the lockdown relaxation period.

There were no neonatal or pregnancy related dermatoses, metabolic, nutritional, depository dermatoses, vascular or reactional dermatoses, with only a negligible number of keratinizing disorders among the patients.

Among dermatological emergencies there was only one case of acute onset erythroderma of the idiopathic type in an elderly male.

In essence, our study brings out the impact of COVID-19 pandemic on regular dermatology outpatient services.

## CONCLUSION

The impact of COVID-19 pandemic has manifested as a decrease in the OP census of fresh dermatological patients. Patients in the extremes of life failed to seek treatment as well as those with asymptomatic dermatoses. Overall, patients were driven by symptoms of pain and pruritus to seek treatment during the study period. Dermatophytosis topped the list as a consequence of accentuation of itch following topical steroid withdrawal. There was an increase in the number of patients with steroid modified dermatophytosis. There was also a noteworthy absence of dermatological emergencies. It was also noted that old cases already on immunosuppression did not report for followup during this period. This may be an important negative effect of the pandemic on severe dermatoses and may prove detrimental in the long-run. Introduction of a teledermatology service by institutions will be beneficial for patients hesitant to visit hospitals to seek medical care during the pandemic. It will deter patients from topical steroid abuse and keep older patients in continued followup. This study emphasizes the need for strict enforcement of the regulations restricting over-the-counter sales of topical antifungal-corticosteroid medications and establishment of teledermatological services for dermatological consultations and follow-up of patients on long term immunosuppressive treatment.

## REFERENCES:

- Galván Casas C, Catala AC, Carretero Hernández G, Rodríguez-Jiménez P, Fernández-Nieto D, Rodríguez-Villa Lario A, Navarro Fernández I, Ruiz-Villaverde R, Falkenhain-López D, Llamas Velasco M, García-Gavín J. Classification of the cutaneous manifestations of COVID-19: a rapid prospective nationwide consensus study in Spain with 375 cases. *British Journal of Dermatology*. 2020 Jul;183(1):71-7.
- Girijala RL, Siddiqi I, Kwak Y, Wright D, Patel DB, Goldberg LH. Pustular DRESS syndrome secondary to hydroxychloroquine with EBV reactivation. *Journal of drugs in dermatology: JDD*. 2019 Feb;18(2):207-9.
- Madigan LM, Micheletti RG, Shinkai K. How Dermatologists Can Learn and Contribute at the Leading Edge of the COVID-19 Global Pandemic. *JAMA dermatology*. 2020 Apr 30.
- Lester JC, Jia JL, Zhang L, Okoye GA, Linos E. Absence of Skin of Colour Images in Publications of COVID-19 Skin Manifestations. *British Journal of Dermatology*. 2020 May 29;4. R. Darlenski and N. Tsankov, "COVID-19 pandemic and the skin: what should dermatologists know?" *Clinics in Dermatology*, In press.
- Lan J, Song Z, Miao X, Li H, Li Y, Dong L, Yang J, An X, Zhang Y, Yang L, Zhou N. Skin damage among health care workers managing coronavirus disease-2019. *Journal of the American Academy of Dermatology*. 2020 May 1;82(5):1215-6.
- Shinkai K, Bruckner AL. Dermatology and COVID-19. *Jama*. 2020 Sep 22;324(12):1133-4.
- Manzo C, Pollio N, Natale M. Sweet's Syndrome Following Therapy with Hydroxychloroquine in a Patient Affected with Elderly-Onset Primary Sjögren's Syndrome. *Medicine*. 2019 Dec;6(4):111.
- Kutlu Ö, Güneş R, Coerd 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 May 13.
- Litchman GH, Rigel DS. The immediate impact of COVID-19 on US dermatology practices. *Journal of the American Academy of Dermatology*. 2020 Aug 1;83(2):685-6.
- Sharif S, Saleem MA, Nisar N, Butt AQ. Effect of COVID-19 on Clinical Spectrum of patients presenting to the Dermatology Outpatient Department of a Tertiary Care Hospital in Rawalpindi. *Journal of Rawalpindi Medical College*. 2020 Aug 6;24(Suppl-1):26-31.
- Białynicki-Birula R, Siemasz I, Otlewska A, Matusiak L, Szepletowski JC. Influence of COVID-19 pandemic on hospitalizations at the tertiary dermatology department in south-west Poland. *Dermatologic Therapy*. 2020 Jul;33(4):e13738.
- Verma S, Madhu R. The great Indian epidemic of superficial dermatophytosis: an appraisal. *Indian Journal of Dermatology*. 2017 May;62(3):227.