

Dermatology and Venereology Consultation Pattern from Inpatient and Emergency Department in Tertiary Hospital Setting Before and During COVID-19 Pandemic

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Background/Purpose: COVID-19 pandemic has compromised healthcare services in dermatology and venereology. Given such circumstances, studies investigating the consultation pattern of related fields in hospitals were relatively scarce. The present study aimed to delineate such matter from tertiary hospital viewpoint.

Methods: Details concerning referred patients from the emergency room, inpatient wards, intensive care unit, and nursery to the Department of Dermatology and Venereology, Dr. Cipto Mangunkusumo Hospital were retrospectively collected from electronic health records. Cases admitted in the 17 months span before and during COVID-19 global outbreak were included. The obtained data were presented descriptively, and Chi-squared test was performed upon attributes of interest at a significance level of 0.05.

Results: A slight increase of total consultation was found in the COVID-19 era with an initial reduction at the beginning (April–May 2020). One-time consultation was the most inquired to our department in both periods of which dermatitis was the most prevalent case and Gram staining was the most common examination. Topical antibiotics and emollient were the most prescribed medications before and during the outbreak, respectively. The conformity of initial-final decision, appropriateness of initial-final diagnosis, and consult response time were significantly different ($p < 0.05$) between the two groups.

Conclusion: There were changes of the number of consultation requests in the pandemic era with statistically significant change of decision conformity, diagnoses, appropriateness, and consult response time. Although some changes appeared, the most prevalent diagnoses remained.

Keywords: consultation pattern, COVID-19, dermatology, venereology

Introduction

Coronavirus disease 2019 (COVID-19) pandemic is currently the leading worldwide issue, caused by an infection of severe acute respiratory syndrome, coronavirus 2 (SARS-CoV-2).¹ First reported in Wuhan, China, in December 2019, this ongoing pandemic has resulted in 754,816,715 positive cases and 6,830,232 deaths around the world by 7 February 2023.² As of 8 February 2023, the COVID-19 National Management Task Force announced 6,731,959 confirmed cases and 160,852 deaths in Indonesia.³ Due to the rapid mutation and transmission rate of the virus, the eradication of COVID-19 is yet to be achieved, even though preventive and curative measures such as health protocols, vaccines, early detection and advancements in treatment are undertaken.^{4–7}

COVID-19 has profoundly devastating effects on global health care, including services related to dermatology and venereology.⁸ Several studies indicate distinctive dermatology characteristics and consultation patterns in the inpatient and emergency departments before and during the COVID-19 pandemic.^{9,10} Moreover, the outbreak has hindered hands-on training and clinical learning of dermatology residents and also negatively impacted the mental health of the dermatologists.^{11,12} Despite present situation, World Health Organization (WHO) suggested perpetual essential health care, especially for special populations such as pediatric and geriatric patients, pregnant women, emergency care, and patients with chronic diseases or comorbidities.¹³ Nevertheless, to the best of our knowledge, only national recommendations for dermatology clinical practice and guidelines or standard operating procedures existed made by the Indonesian Society of Dermatology and Venereology (INSDV).¹⁴

Therefore, we attempted to further expand the available studies regarding dermatology and venereology (DV) consultation in COVID-19 pandemic era with Dr. Cipto Mangunkusumo Hospital (RSCM), national tertiary and teaching hospital of Faculty of Medicine, Universitas Indonesia (FKUI). Even though the current COVID-19 outbreak is relatively controlled in several regions, through this study, we look forward to a better understanding of DV consultation pattern in hospital settings as a foundation to develop a patient-centered guideline for clinical practice, should a similar pandemic situation is happening again in the future.

Methods

Study Population and Sample Selection

This study incorporated all patients consulted from the emergency room, inpatient wards, intensive care unit (ICU), and nursery to the Department of Dermatology and Venereology, RSCM, before and during the COVID-19 pandemic. The referrals to our department from August 2018 to December 2019 constituted the former group, while the latter comprised of those admitted from April 2020 to August 2021. We excluded consultations from January 2020 to March 2020 as they were in the transition period between the index case of COVID-19 (31 December 2019) and the global outbreak declaration by WHO (11 March 2020).

Data Collection and Analysis

The data regarding referred patients and relevant information were retrieved from electronic health records. Recorded attributes of every presented case included referral date, consultation and response time, name, age, medical record number, gender, payment source, location, referring department, initial request and final decision, initial and final diagnoses and treatments, as well as requested supporting examinations. Initial assessments were issued by the referring department, while the final evaluations were established by dermatologists at RSCM. Entries with any missing essential details were eventually eliminated for further analyses. We also obtained data concerning the total number of confirmed COVID-19 patients admitted to RSCM (from both inpatient and emergency units) during April 2020 to August 2021 period for comparison.

Afterwards, several attributes of interest were compared between the two groups (before and during COVID-19 pandemic) in terms of the conformity of initial request and final decision, the appropriateness of initial and final diagnoses, as well as consultation response time. For each admission, they were categorized as “match”, “partially match”, or “not match”, determined by the agreement between initial assessment and final evaluation. In addition, every consultation was considered having the “ideal” response time if answered within 30 minutes, otherwise they were classified as “not ideal”. Analyses were performed with an appropriate statistical test (Chi-squared or Fisher’s exact) at a significance level of 0.05, utilizing Statistical Package for the Social Sciences (SPSS)[®] version 23.0 software for Microsoft Windows.

Results

For the 17 months period before and during COVID-19 global outbreak, a total of 946 and 1037 patients were presented to the Department of Dermatology and Venereology, RSCM, respectively. During the pandemic interval, two patients supposedly referred to urology and digestive surgery were incorrectly consulted to our department, while the other three had their data about initial requests and final decisions missing. The demographics of the final 946 (before pandemic) and 1032 (during pandemic) patients who were eligible for subsequent analyses are shown in [Table 1](#).

Table I Characteristics of Patients Consulted to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

| Parameter | Before COVID-19 Pandemic (August 2018-December 2019) | | During COVID-19 Pandemic (April 2020-August 2021) | |
|---|---|-------|--|-------|
| | N | % | N | % |
| Total case | 946 | 100.0 | 1032 | 100.0 |
| <i>Gender</i> | | | | |
| Male | 464 | 49.0 | 520 | 50.4 |
| Female | 482 | 51.0 | 512 | 49.6 |
| <i>Age group</i> | | | | |
| Newborns (<2 months old) | 67 | 7.1 | 54 | 5.2 |
| Infants (<1 year old) | 52 | 5.5 | 58 | 5.6 |
| Children (1–17 years old) | 147 | 15.5 | 202 | 19.6 |
| Adults (18–59 years old) | 513 | 54.2 | 521 | 50.5 |
| Elderly (>59 years old) | 167 | 17.7 | 197 | 19.1 |
| <i>Consultation time^a</i> | | | | |
| Working hours | 661 | 69.9 | 720 | 69.8 |
| Non-working hours | 285 | 30.1 | 312 | 30.2 |
| <i>Payment source</i> | | | | |
| National health insurance | 921 | 97.4 | 970 | 94.0 |
| Personal payment | 18 | 1.9 | 18 | 1.7 |
| Ministry of Health insurance ^b | N/A | N/A | 35 | 3.4 |
| Hospital coverage ^c | 7 | 0.7 | 9 | 0.9 |
| <i>Location</i> | | | | |
| Emergency room | 233 | 24.6 | 179 | 17.3 |
| Inpatient ward | 528 | 55.8 | 582 | 56.4 |
| ICU | 138 | 14.6 | 151 | 14.6 |
| Nursery | 47 | 5.0 | 57 | 5.5 |
| Inpatient ward for COVID-19 | N/A | N/A | 33 | 3.2 |
| ICU for COVID-19 | N/A | N/A | 30 | 2.9 |
| <i>Referring department</i> | | | | |
| Internal medicine | 367 | 38.8 | 407 | 39.4 |
| Pediatrics | 244 | 25.8 | 298 | 28.9 |
| Anesthesiology | 88 | 9.3 | 100 | 9.7 |
| Obstetrics and gynecology | 33 | 3.5 | 21 | 2.0 |
| Neurology | 50 | 5.3 | 52 | 5.0 |

(Continued)

Table I (Continued).

| Parameter | Before COVID-19 Pandemic (August 2018-December 2019) | | During COVID-19 Pandemic (April 2020-August 2021) | |
|---------------------|---|-----|--|-----|
| | N | % | N | % |
| Psychiatry | 20 | 2.1 | 25 | 2.4 |
| Ophthalmology | 13 | 1.4 | 21 | 2.0 |
| Triage | 58 | 6.1 | 58 | 5.6 |
| Others ^d | 73 | 7.7 | 50 | 4.8 |

Notes: ^aConsidered as “working hours” if presented between 07:30 a.m. and 03:30 p.m. during business days (Monday to Friday, except national holiday); ^bGranted to COVID-19 patients as the national health insurance did not cover for the disease; ^cFor underprivileged patients with special cases that were not covered by insurance, which required approval from the director board of RSCM; ^dIncluding forensics, neurosurgery, otorhinolaryngology, orthopedics, pediatric surgery, plastic surgery, urology, and vascular surgery.

Abbreviations: N, number of patients; N/A, not available.

Distribution of patients was analyzed as depicted in Figure 1. The consultations from both before and during the pandemic were varied, even though there was an initial reduction in April–May 2020. There were additional emergency rooms, ICU, and inpatient wards in the COVID-19 building. Domination of one-time consultation requests, as presented in Table 2, was seen in both eras.

There were no changes in consultation cases to our department comparing both periods as presented in Table 3. Dermatitis was the most common diagnosis found in pre- and during the pandemic. The most requested examinations were Gram staining, followed by KOH test in both eras (Table 4). Topical antibiotics were the most utilized therapy before COVID-19 outbreak, meanwhile emollient was most often prescribed in the pandemic era, as shown in Table 5.

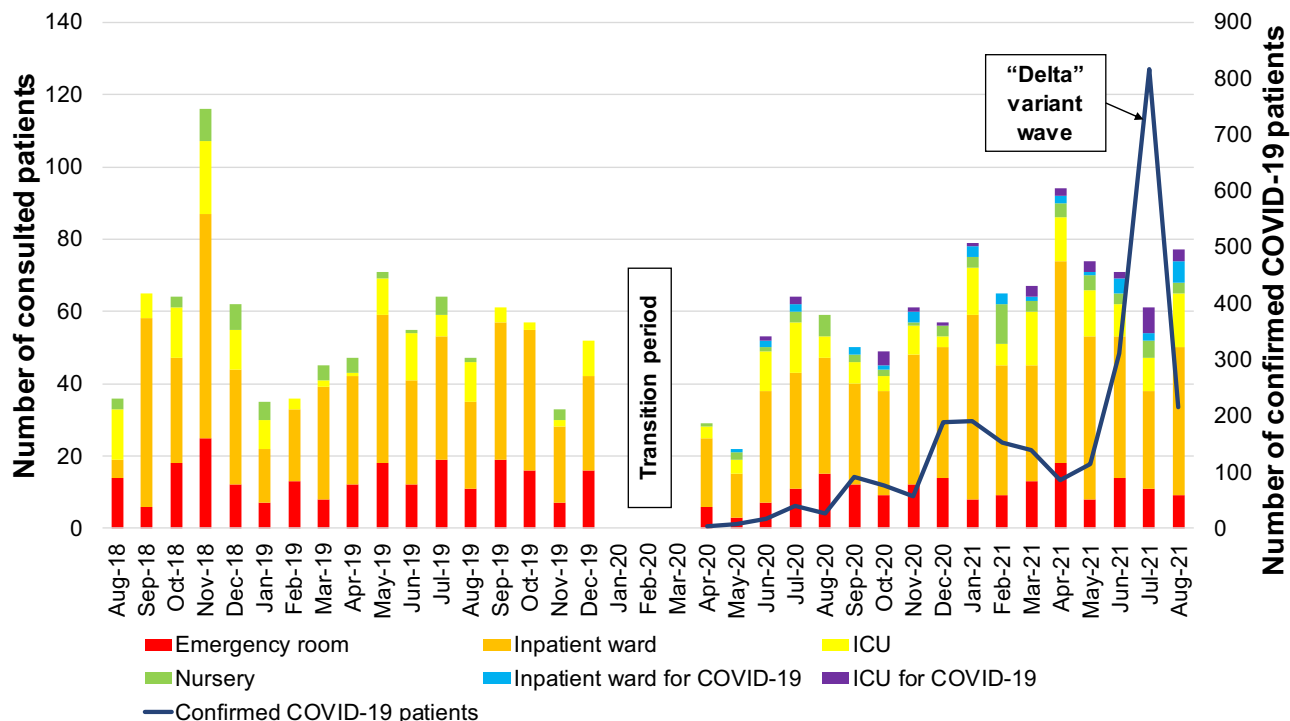


Figure 1 Monthly distribution of patients consulted to the Department of Dermatology and Venereology before (August 2018-December 2019) and during (April 2020-August 2021) COVID-19 pandemic (bar chart) in relation to the number of confirmed COVID-19 cases presented to emergency unit and inpatient ward of RSCM (line graph).

Table 2 Initial Request and Final Decision of Cases Presented to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

| Request/Decision | Before COVID-19 Pandemic (August 2018-December 2019) | | | | During COVID-19 Pandemic (April 2020-August 2021) | | | |
|------------------------------|---|------|-------|------|--|------|-------|------|
| | Initial | | Final | | Initial | | Final | |
| | N | % | N | % | N | % | N | % |
| One-time consultation | 333 | 35.2 | 556 | 58.8 | 401 | 38.9 | 754 | 73.1 |
| Collaborative inpatient care | 486 | 51.4 | 156 | 16.5 | 571 | 55.3 | 186 | 18.0 |
| Chief/in charge transfer | 127 | 13.4 | 150 | 15.9 | 60 | 5.8 | 38 | 3.7 |
| Outpatient follow-up | - | - | 84 | 8.9 | - | - | 54 | 5.2 |

Abbreviation: N, number of patients.

Table 3 Initial and Final Diagnoses of Patients Admitted to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

| Diagnosis ^a | Before COVID-19 Pandemic (August 2018-December 2019) | | | | During COVID-19 Pandemic (April 2020-August 2021) | | | |
|-----------------------------------|---|-----|-------|------|--|------|-------|------|
| | Initial | | Final | | Initial | | Final | |
| | N | %* | N | %* | N | %* | N | %* |
| Immunological disorder | 21 | 2.2 | 44 | 4.7 | 46 | 4.5 | 76 | 7.4 |
| Psoriasis | 14 | 1.5 | 6 | 0.6 | 21 | 2.0 | 20 | 1.9 |
| Contact dermatitis | 47 | 5.0 | 166 | 17.5 | 28 | 2.7 | 195 | 18.9 |
| Other dermatitis | 32 | 3.4 | 108 | 11.4 | 87 | 8.4 | 124 | 12.0 |
| Allergic drug eruption | 31 | 3.3 | 64 | 6.8 | 43 | 4.2 | 47 | 4.6 |
| Other non-infectious skin disease | 28 | 3.0 | 74 | 7.8 | 24 | 2.3 | 136 | 13.2 |
| Lymphatic disorder | - | - | - | - | 3 | 0.3 | 6 | 0.6 |
| Hair loss | 2 | 0.2 | 3 | 0.3 | 3 | 0.3 | 5 | 0.5 |
| Skin and soft tissue neoplasm | 1 | 0.1 | 1 | 0.1 | 8 | 0.8 | 25 | 2.4 |
| Primary bacterial infection | 74 | 7.8 | 106 | 11.2 | 87 | 8.4 | 89 | 8.6 |
| Ulcer | 59 | 6.2 | 62 | 6.6 | 66 | 6.4 | 100 | 9.7 |
| Nail disorder | 1 | 0.1 | 6 | 0.6 | 10 | 1.0 | 16 | 1.6 |
| Secondary infection | 2 | 0.2 | 13 | 1.4 | 19 | 1.8 | 168 | 16.3 |
| Tuberculous skin manifestation | - | - | 3 | 0.3 | 3 | 0.3 | 10 | 1.0 |
| Leprosy | 4 | 0.4 | 7 | 0.7 | 13 | 1.3 | 14 | 1.4 |
| Herpes zoster | 4 | 0.4 | 8 | 0.8 | 36 | 3.5 | 41 | 4.0 |
| Viral infection | 53 | 5.6 | 65 | 6.9 | 13 | 1.3 | 31 | 3.0 |
| Parasitic infestation | 8 | 0.8 | 41 | 4.3 | 18 | 1.7 | 33 | 3.2 |
| Fungal infection | 82 | 8.7 | 147 | 15.5 | 113 | 10.9 | 189 | 18.3 |
| Syphilis | 3 | 0.3 | 3 | 0.3 | 19 | 1.8 | 26 | 2.5 |

(Continued)

Table 3 (Continued).

| Diagnosis ^a | Before COVID-19 Pandemic (August 2018-December 2019) | | | | During COVID-19 Pandemic (April 2020-August 2021) | | | |
|-------------------------------|---|------|-------|-----|--|------|-------|-----|
| | Initial | | Final | | Initial | | Final | |
| | N | %* | N | %* | N | %* | N | %* |
| Acneiform eruption | 1 | 0.1 | 11 | 1.2 | 3 | 0.3 | 22 | 2.1 |
| Other infectious skin disease | 3 | 0.3 | 1 | 0.1 | 2 | 0.2 | 4 | 0.4 |
| Pruritus | 16 | 1.7 | 28 | 3.0 | 34 | 3.3 | 6 | 0.6 |
| Erythematous macules | 19 | 2.0 | 4 | 0.4 | 85 | 8.2 | 4 | 0.4 |
| Erythroderma | 7 | 0.7 | 13 | 1.4 | 6 | 0.6 | 11 | 1.1 |
| Non-erythematous macules | 15 | 1.6 | 21 | 2.2 | 17 | 1.6 | 55 | 5.3 |
| Solid skin lesion | 4 | 0.4 | 1 | 0.1 | 37 | 3.6 | 23 | 2.2 |
| Non-solid skin lesion | 3 | 0.3 | 7 | 0.7 | 47 | 4.6 | 9 | 0.9 |
| Edema | - | - | - | - | 5 | 0.5 | 4 | 0.4 |
| COVID-19 skin manifestation | N/A | N/A | N/A | N/A | 6 | 0.6 | 7 | 0.7 |
| Unspecified skin lesion | 168 | 17.8 | 10 | 1.1 | 22 | 2.1 | 19 | 1.8 |
| Hemorrhagic skin lesion | 13 | 1.4 | 51 | 5.4 | 11 | 1.1 | 50 | 4.8 |
| Unspecified skin wound | 26 | 2.7 | 33 | 3.5 | 41 | 4.0 | 13 | 1.3 |
| Scar | 1 | 0.1 | 2 | 0.2 | 1 | 0.1 | 18 | 1.7 |
| Urticaria/angioedema | 14 | 1.5 | 17 | 1.8 | 7 | 0.7 | 7 | 0.7 |
| Urethral/vaginal discharge | 9 | 1.0 | 6 | 0.6 | 19 | 1.8 | 13 | 1.3 |
| Necrotic skin lesion | 1 | 0.1 | 3 | 0.3 | 1 | 0.1 | 3 | 0.3 |
| Xerotic skin | 6 | 0.6 | 23 | 2.4 | 16 | 1.6 | 73 | 7.1 |
| No initial diagnosis | 182 | 19.2 | - | - | 138 | 13.4 | - | - |
| Normal condition | - | - | 4 | 0.4 | - | - | 6 | 0.6 |

Notes: ^aOne patient may have multiple diagnoses; *Calculated relative to the total number of patients before and during COVID-19 pandemic (946 and 1032, respectively).

Abbreviations: N, number of patients with the diagnosis; N/A, not available.

Table 4 Requested Supporting Examinations for Patients Consulted to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

| Supporting Examination ^a | Before COVID-19 Pandemic (August 2018-December 2019) | | During COVID-19 Pandemic (April 2020-August 2021) | |
|-------------------------------------|---|------|--|------|
| | N | %* | N | %* |
| Gram staining | 484 | 51.2 | 397 | 38.5 |
| KOH test | 199 | 21.0 | 332 | 32.2 |
| Tzanck test | 11 | 1.2 | 19 | 1.8 |

(Continued)

Table 4 (Continued).

| Supporting Examination ^a | Before COVID-19 Pandemic (August 2018-December 2019) | | During COVID-19 Pandemic (April 2020-August 2021) | |
|-------------------------------------|---|------|--|------|
| | N | %* | N | %* |
| Skin biopsy | 17 | 1.8 | 64 | 6.2 |
| Serology | 22 | 2.3 | 57 | 5.5 |
| Others ^b | 15 | 1.6 | 162 | 15.7 |
| No tests ordered | 235 | 24.8 | 345 | 33.4 |

Notes: ^aMultiple tests may be ordered for one patient; ^bIncluding blood tests, radiological examinations, and microbial cultures; *Calculated relative to the total number of patients before and during COVID-19 pandemic (946 and 1032, respectively).

Abbreviation: N, number of patients with the requested supporting examination.

Table 5 Initial and Final Treatments of Cases Presented to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

| Treatment ^a | Before COVID-19 Pandemic (August 2018-December 2019) | | | | During COVID-19 Pandemic (April 2020-August 2021) | | | |
|---------------------------------|---|------|-------|------|--|------|-------|------|
| | Initial | | Final | | Initial | | Final | |
| | N | %* | N | %* | N | %* | N | %* |
| Topical antibiotics | 5 | 0.5 | 322 | 34.0 | 10 | 1.0 | 249 | 24.1 |
| Topical antifungal | 1 | 0.1 | 159 | 16.8 | 13 | 1.3 | 234 | 22.7 |
| Topical antiparasitic drug | - | - | 11 | 1.2 | - | - | 32 | 3.1 |
| Topical corticosteroid | 1 | 0.1 | 162 | 17.1 | 1 | 0.1 | 203 | 19.7 |
| Systemic antibiotic | 27 | 2.9 | 76 | 8.0 | 86 | 8.3 | 142 | 13.8 |
| Systemic antifungal | - | - | 43 | 4.5 | 8 | 0.8 | 31 | 3.0 |
| Systemic corticosteroid | 4 | 0.4 | 57 | 6.0 | 19 | 1.8 | 106 | 10.3 |
| Antihistamine | 2 | 0.2 | 97 | 10.3 | 4 | 0.4 | 111 | 10.8 |
| Emollient | 1 | 0.1 | 225 | 23.8 | 1 | 0.1 | 412 | 39.9 |
| Keratolytic agent | - | - | 13 | 1.4 | - | - | 9 | 0.9 |
| Wound dressing | - | - | 8 | 0.8 | - | - | 8 | 0.8 |
| Compression with saline water | 1 | 0.1 | 315 | 33.3 | 2 | 0.2 | 390 | 37.8 |
| Topical zinc | 3 | 0.3 | 25 | 2.6 | 8 | 0.8 | 122 | 11.8 |
| Discontinuation of agents/drugs | - | - | 69 | 7.3 | - | - | 249 | 24.1 |
| Others ^b | 352 | 37.2 | 275 | 29.1 | 34 | 3.3 | 213 | 20.6 |
| No initial treatment | 556 | 58.8 | - | - | 878 | 85.1 | - | - |
| No definitive treatment | - | - | 9 | 1.0 | - | - | 60 | 5.8 |

Notes: ^aOne patient may be prescribed with multiple treatments; ^bIncluding fluid resuscitation, electrolyte correction, analgesics, proton pump inhibitors, antiemetics, and biologic agents; *Calculated relative to the total number of patients before and during COVID-19 pandemic (946 and 1032, respectively).

Abbreviation: N, number of patients subjected to the specific treatment.

Table 6 Attributes of Interest from the Admitted Patients to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

| Attribute of Interest | Before COVID-19 Pandemic (August 2018-December 2019) | | During COVID-19 Pandemic (April 2020-August 2021) | | p value ^a |
|--|---|------|--|------|----------------------|
| | N | % | N | % | |
| <i>Initial request and final decision conformity^b</i> | | | | | |
| Match | 556 | 58.8 | 558 | 54.1 | 0.035* |
| Not match | 390 | 41.2 | 474 | 45.9 | |
| <i>Initial-final diagnoses appropriateness^c</i> | | | | | |
| Match | 219 | 23.2 | 263 | 25.5 | <0.001* |
| Partially match | 44 | 4.7 | 189 | 18.3 | |
| Not match | 683 | 72.2 | 580 | 56.2 | |
| <i>Consultation response time</i> | | | | | |
| Ideal (≤30 min) | 645 | 68.2 | 856 | 82.9 | <0.001* |
| Not ideal (>30 min) | 301 | 31.8 | 176 | 17.1 | |

Notes: ^aCalculated with Chi-squared test; ^bDetermined as "match" if the initial request from the referring department was appropriate with the final decision from our department; ^cClassified as "match" and "partially match" if the initial diagnoses from the referring department were all correct and if at least one of them was correct, respectively; *p < 0.05.

Abbreviation: N, number of patients.

Our interests, categorized into three variables which were initial-final decision conformity, initial-final diagnosis appropriateness, and consult response time, showed a statistically significant difference between the two groups (Table 6; p < 0.05).

Discussion

Table 1 shows the characteristics of patients consulted to the Department of Dermatology and Venereology before and during the COVID-19 pandemic era. In the two periods, the total case was higher by 9.1% during pandemic era. However, it contradicted the number of visits in the dermatology outpatient settings which showed a decline in several places.^{15,16} This might be due to lockdown and/or limitation of mobilization as well as non-emergency clinic visits. However, between April and May 2020, we counted an initial decline of consultations which may draw attention. In this period of time, Indonesia had a relatively low number of infected patients with a total case of 139 to 557 patients. Our government's strict rules were also introduced and implemented which resulted in the limitation of mobilization. This reduction was not sustained as there was a rise in June 2020 since Indonesia started to have more than 1000 COVID-19 cases.¹⁷

Among the consultation, the adult patient group had the biggest proportion of consultations, followed by the children group in both before and during the pandemic. These data represented adult and pediatric patients contributed as the two largest populations in Indonesia.¹⁸ Similar finding was also found in several studies across the globe.^{19,20} In terms of gender, the consultation of male patients was slightly higher than female by 1% in the pandemic era. Although in pre-pandemic era, women had a 1% bigger share, this fact was in accordance with the share of women and men population in Indonesia by 2018–2021.^{18,21} Regarding healthcare payment source, our data showed that the National Health Insurance (NHI) was used by more than 90% patients. Meanwhile, there were no patients utilizing Ministry of Health Insurance (MHI) in pre-pandemic era since it was established only after the outbreak emerged. In our hospital, as the top referral national hospital of the country, every patient who was referred from other regional or private hospitals should be registered with NHI after they went through the national referral system. Other funding such as out-of-pocket and hospital coverage were only used by a little number of patients.

Percentage of ideal consultations before and during the pandemic were almost similar, shared 69.9% and 69.8%, respectively. This showed constant behavior of other departments requesting a consultation to Department of

Dermatology and Venereology. Our study showed consultations either from the emergency department or other patient wards were requested from various departments, especially from the Department of Internal Medicine. This finding is in accordance with several studies^{22–24} as well as the adult population in Indonesia¹⁸ and around the globe.²³

As presented in [Figure 1](#), the peak number of consultations from the inpatient wards was observed in November 2018 (before the pandemic) and April 2021 (during the pandemic), contradicting the surge of Delta variant wave in Indonesia. Our data also showed that the consultation in non-COVID inpatient wards during a pandemic was a dominant contribution compared to other consultations. In fact, our data showed that only 63 COVID-19 patients (6.1%) consulted to our department along April 2020–August 2021 compared to our 969 non-COVID patients (93.9%). Apart from COVID-19 patients, the number of consultations was relatively similar. This might be due to the nation having built a COVID-19 center apart from the hospital so that only patients with severe disease, who had not been able to be treated in the center, would be transferred to the nearest national referral hospital.

Before the pandemic era, 486 out of the total 946 cases (51.4%) was requested to be in a collaborative care, but only 150 cases (15.9%) were approved by our department. Meanwhile, in the pandemic era, DV was requested to collaborate in a lower percentage. This might be due to non-emergent consultations that were likely to be suppressed when the pandemic began. This is in accordance with our data showing that the most requested diagnoses in the emergency unit, inpatient ward, ICU, and nursery were other dermatitis, contact dermatitis, viral infection, and non-solid skin lesions, respectively.

For diagnosis, the most prevalent consultations were contact dermatitis in both pandemic and pre-pandemic situations, while the second most in the two periods was fungal infection. There are numerous patterns of the most common diagnoses in studies. A similar study about referral pattern in a tertiary hospital in the United States showed that drug eruption, dermatitis, and viral infection contribute to most of the consultation,²⁴ while in Switzerland, inflammatory disease was the most prevalent case.²⁵ Other studies revealed that infections are the most frequent cases, which was also found in our study.²² We believe that these differences are linked to the setting of the patient.

Gram staining was the most common examination before and during the pandemic ([Table 4](#)). This examination is known to be widely used in diagnosing skin infection. In numerous DV treatments ([Table 5](#)), topical antibiotics were the most commonly prescribed treatment, accounting for 34.0%, followed by compression with saline water 33.3% before COVID-19 era. During the pandemic period, the most prescribed therapy was emollient (39.9%) and the use of compression with saline water was in the second position among other treatments. This finding is comparable to another study by Samorano-Lima et al²⁶ which showed that the two most common diagnoses were dermatitis and cutaneous infection. Interestingly, topical antibiotics were used almost three times higher in frequency than our primary bacterial infection cases. This may be explained by the fact that topical antibiotics are also prescribed in other skin conditions such as acne or lesions with secondary bacterial infection. Emollients and saline water as supporting treatments for most of the skin diseases were also captured as the most frequent therapy. These patterns were also seen in numerous studies.^{24,27}

Looking deeper to our attributes of interest from the DV consultation ([Table 6](#)), our study showed 58.8% of initial requests matched to the final decision by the dermatologist in pre-COVID-19 period, but significantly lower in the pandemic era (54.1%). The final decision of collaborative care by our department in both before and during the pandemic was lower than the initial diagnosis. Similar cutaneous manifestation of skin diseases was probably one of the factors. Current dermatological features related to COVID-19 may also have a role. These factors may contribute other specialties in choosing collaborative care over one-time consultation. Unfortunately, there are sparse studies focusing on these variables. In terms of correct diagnoses, our study found that more than half the diagnoses were incorrect in both periods but significantly lower in the pandemic era. This finding was in accordance with other studies which showed that only about 30% provisional diagnosis matched with final diagnosis by dermatologists.²⁸ The ideal response times during the pandemic were higher than that before the pandemic. This situation may be explained by the minimal duration of doctor-patient contact policy during COVID-19 outbreak in our institution, which elicited a faster response in answering the referrals.

Compared to our results, we found that the inpatient and emergency consultation patterns of other medical specialties were approximately consistent with slight exceptions. For instance, Engin et al reported an insignificant difference of the

total number of emergency unit patients consulted to ophthalmology department before and during COVID-19 times.²⁹ An observational study by Shomorony et al also unveiled a relatively stable number of inpatient consultations to otolaryngology department following the onset of COVID-19 outbreak, but a remarkable increase in the amount of intubation requests for critical COVID-19 patients was observed.³⁰ This is understandable since SARS-CoV-2 infections primarily affect respiratory system and maintaining the patency of airway is an essential and life-saving procedure amidst the situation. While skin is the secondary target organ for the virus, it may provide a probable explanation on the relatively equal number of total consultations and the most prevalent dermatology diagnoses pre- and during COVID-19 pandemic in our study. The circumstances may be different in dermatology outpatient clinic setting, as stated by Alfieri and Yogianti that the total patient visit, number of diagnostic and therapeutic procedures, and the most frequent cases were contrasted between two periods.³¹ Nevertheless, due to the dermatology and venereology referrals from outpatient department in Indonesian tertiary hospital have been studied, we did not include the consultation from outpatient clinic of our hospital in this study.

Conclusion

Based on observation before and during COVID-19 pandemic, we found several alterations in terms of the total DV consultation number to our department, with statistically significant differences in initial request and final decision conformity, appropriateness of initial and final diagnoses, and consult response time. The most prevalent diagnoses (dermatitis and skin infections) prevailed regardless of COVID-19 outbreak situation. These findings may prompt similar observational studies in other healthcare settings and serve as a foundation to establish a patient-oriented guideline for consultation in the event of future pandemic occasion.

Ethical Concern

This retrospective study was designed and conducted according to the Declaration of Helsinki principles. Additionally, the study approval was conferred by the Health Research Ethics Committee of the Faculty of Medicine, Universitas Indonesia on 25 October 2021 with the protocol number KET-1031/UN2.F1/ETIK/PPM.00.02/2021. As per the committee policy, the patients' data included in this research were extracted from the medical record at Dr. Cipto Mangunkusumo Hospital (the tertiary and teaching hospital of the Faculty of Medicine, Universitas Indonesia) while maintaining their confidentiality, without any additional information collected through interviews or phone calls. Therefore, written consent from the study subjects is not required.

Funding

Financial support for this present study was provided by a research grant from Universitas Indonesia (Hibah Publikasi Terindeks Internasional 2022) with the contract number NKB-601/UN2.RST/HKP.05.00/2022.

Disclosure

The authors hereby declare that we have no potential conflicts of interest to disclose.

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