Influence of COVID-19 pandemic on hospitalizations at the tertiary dermatology department in south-west Poland

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Abstract
New virus SARS-Cov-2 infection has spread over the world affecting all daily activities, including functioning of health services. Due to pandemic, many hospitals were ordered to re-organize their work. The aim of the current report was to evaluate the influence of COVID-19 pandemic on the hospitalizations at the tertiary dermatology department in south-west Poland. Two corresponding periods of 2019 and 2020 were compared in aspect of number of hospitalizations, sex, and age profile of inpatients. We clearly showed a significant reduction of hospitalized patients during the pandemic period, with marked reduction of female patients. Moreover, the significant decrease of admissions to dermatology ward was observed within children and patients older than 70 years. Patients with chronic inflammatory dermatoses (eg, atopic dermatitis, eczemas, lichen planus, pityriasis rubra pilaris) were less often hospitalized during the pandemic period. In contrast, patients suffering from dermatitis due to substances taken internally, erysipelas, syphilis, and primary cutaneous lymphomas constituted significantly higher rate of hospitalized subjects in the year 2020.

KEYWORDS
COVID-19, dermatology service, hospitalizations, SARS-Cov-2

INTRODUCTION
The first cases of infection with a novel virus SARS-Cov-2 were recorded in Wuhan (China) in December 2019. With the spread of infection World Health Organization announced a pandemic on the 11 March 2020. The virus is responsible for the disease known as coronavirus disease 2019 (COVID-19) with a mortality rate of 2% to 2.5%. That is why radical countermeasures have been taken worldwide. In the absence of effective treatment and vaccination, it was decided in many countries to introduce quarantine as the only anti-epidemic measure. In Poland, the first case of SARS-Cov-2 infection was recorded on 4 March 2020, and on 13 March 2020, the government introduced the so-called epidemic condition resulting in a significant reduction in the functioning of institutions and enterprises. At the same time, special hospitals were appointed to admit only infected patients. Moreover, all hospitals were ordered to limit their planned activity. Such restrictions resulted in an unprecedented low number of hospitalized patients.

This study was undertaken to analyze the profile of hospitalizations in tertiary dermatology department in Poland during the first weeks of COVID-19 pandemic and to compare it with corresponding period of the previous year.

MATERIAL AND METHODS
The study was carried out at the Department of Dermatology, Venereology and Allergology in Wroclaw, Poland. This is the university department with 66 beds exclusively for patients with cutaneous and sexually transmitted diseases, providing a tertiary dermatology...
service. The department is located in an isolated building; no other hospital wards are placed there. We compared hospitalization profile of two corresponding 9-week periods of 2019 and 2020 (18 March 2019 to 19 May 2019 and 14 March 2020 to 15 May 2020, respectively). The start point of 14 March 2020 was taken into consideration as this was the begging of the introduced specific restrictions. On 12 March 2020, the hospital authorities strongly suggested to discharge the possible patients and limit the planned admissions to the necessary minimum. In our final analysis, we considered number of hospitalizations (admissions) with first admissions and re-hospitalizations, sex, and age of patients, as well as the diagnoses of admitted patients.

The obtained results were statistically analyzed with Statistica 13; Statsoft, Tulsa, Oklahoma. The chi-square test was applied to determine statistical differences between groups. The resulting P-values were considered significant if P < .05.

3 | RESULTS

A very dramatic drop in hospitalizations due to COVID-19 pandemic was noted (Table 1). During the 9 week period of the last year (2019), 626 patients were admitted, while only 176 (decrease of 71.9%) subjects were hospitalized during the corresponding pandemic period in 2020. The significant changes in the proportion of females and males were observed (P < .0001). The percentage of women clearly out Weighed in 2019, constituting 58.8% of all inpatients, and fell to 41.5% in 2020. There were no differences in the distribution of the first and re-hospitalizations. Analyzing the ages of inpatients groups, a significant decrease in the number of admitted children (P = .025) and patients over the age of 70 years (P = .016) was found. The percentage of hospitalized children dropped from 12.9% to 6.8% and elderly patients from 19.8% to 11.9%. As a consequence of breakdown in admissions of above mentioned age groups, the 19-70 years group was significantly (P = .0003) more commonly hospitalized in 2020 in comparison to 2019 (Table 1). Based on the ICD-10 classification, during viral pandemic, a significant decrease in admissions was observed of patients with the following diagnosis: atopic dermatitis, other eczematous dermatoses, lichen planus, pityriasis rubra pilaris (Table 2). In contrast, patients suffering from dermatitis due to substances taken internally, erysipelas, syphilis, and primary cutaneous lymphomas were admitted in significantly higher rate in 2020 compared to 2019 (Table 2). The observed increase of percentage of hospitalized patients with psoriasis during the COVID-19 pandemic was due to rather a stable number of admitted psoriatic individuals treated with biologic agents in both analyzed periods (49 and 43 subjects, respectively).

4 | DISCUSSION

Pandemic of SARS-Cov-2 virus created a completely new scenario for health care system. This affected also regular activities of several units providing dermatology service. Depending on different organization of dermatological care in various countries both outpatient and inpatient services were re-organized. In this report we clearly documented marked decrease in hospitalizations of patients with dermatologic problems and significant change in patients profile concerning the sex and age of admitted subjects as well as diagnoses of hospitalized patients. At the Dermatology Unit of University Hospital of Bologna, ordinary dermatologic hospitalization service was completely suspended. Out of six beds, only two were kept for emergency dermatologic cases. In our department, the situation was similar; however, the restrictions were not so severe. We maintained admitting limited number of patient mainly with acute dermatoses (eg, dermatitis due to substances taken internally, erysipelas, erythema multiforme) as well as severe disorders (eg, cutaneous lymphomas, bullous disorders). In Skopje, Republic of Macedonia, bullous disorders and cutaneous infections also constituted main reasons for patients hospitalizations. Similarly to Italian colleagues, we also observed reduced, however not significant, number of patients with skin cancers. All the surgical procedures were limited to minimum as

### TABLE 1

| No. of inpatients (total) | 18/Mar/May 19, 2019/2019 (n) | 14/Mar/May 15, 2020/2020 (n) | P value |
|--------------------------|-----------------------------|-----------------------------|---------|
| Sex                      |                             |                             |         |
| Females                  | 368 (58.8%)                 | 73 (41.5%)                  | <.0001  |
| Males                    | 258 (41.2%)                 | 103 (58.5%)                 |         |
| First/subsequent hospitalization |                |                             |         |
| First                    | 392 (62.6%)                 | 96 (54.5%)                  |         |
| Subsequent               | 234 (37.4%)                 | 80 (45.5%)                  |         |
| Age of inpatients (years)|                             |                             |         |
| 2–<18                    | 81 (12.9%)                  | 12 (6.8%)                   | .025    |
| 19–70                    | 421 (67.3%)                 | 143 (81.3%)                 | .0003   |
| >70                      | 124 (19.8%)                 | 21 (11.9%)                  | .016    |

Abbreviation: NS, not significant.
| Period | 18/Mar/2019–May 19, 2019 (n) | 14/Mar/2020–May 15, 2020 (n) | P value |
|--------|-----------------------------|-----------------------------|---------|
| Diseases of the skin and subcutaneous tissue (XII) | 425 (67.9%) | 120 (68.2%) | NS |
| L01-L08 (Infections of the skin and subcutaneous tissue) | 4 (0.6%) | 2 (1.1%) | NS |
| L10-14 (Bullous disorders) | 27 (4.3%) | 10 (5.7%) | NS |
| L20 (Atopic dermatitis) | 34 (5.4%) | 1 (0.6%) | .005 |
| L27 (Dermatitis due to substances taken internally) | 4 (0.6%) | 8 (4.5%) | .0001 |
| L20-L30 (excl. L20 & L27) (Dermatitis and eczema) | 70 (11.2%) | 6 (3.4%) | .0018 |
| L40 (Psoriasis) | 127 (20.3%) | 55 (31.3%) | .002 |
| L41 (Parapsoriasis) | 11 (1.8%) | 1 (0.6%) | NS |
| L43-L44 (Lichen planus & other papulosquamous disorders) | 17 (2.7%) | 1 (0.6%) | <.0001 |
| L50 (Urticaria) | 12 (1.9%) | 7 (3.9%) | NS |
| L51 (Erythema multiforme) | 1 (0.1%) | 2 (1.1%) | NS |
| L52-L57 (Erythema nodosum, other erythematous conditions, erythema in diseases classified elsewhere, radiation-related disorders of the skin and subcutaneous tissue) | 7 (1.1%) | 3 (1.7%) | NS |
| L63 (Alopecia areata) | 17 (2.7%) | 4 (2.3%) | NS |
| L64-L67 (Androgenic alopecia, other nonscarring hair loss, cicatricial alopecia, hair color, and hair shaft abnormalities) | 13 (2.1%) | 2 (1.1%) | NS |
| L70-L74 (Acne, rosacea, follicular cysts of skin and subcutaneous tissue, other follicular disorders, eccrine sweat disorders) | 11 (1.8%) | 1 (0.6%) | NS |
| L85-L91 (Other epidermal thickening, keratoderma in diseases classified elsewhere, transepidermal elimination disorders, pyoderma gangrenosum, decubitus ulcer and pressure area, atrophic disorders of skin, hypertrophic disorders of skin) | 13 (2.1%) | 4 (2.3%) | NS |
| L92 (Granulomatous disorders of skin and subcutaneous tissue) | 11 (1.8%) | 0 (0.0%) | NA |

(Continues)
| Period | 18/Mar/2019–May 19, 2019 (n) | 14/Mar/2020–May 15, 2020 (n) | P value |
|--------|---------------------------|----------------------------|---------|
| L93 (Lupus erythematosus, CLE) | 10 (1.6%) | 1 (0.6%) | NS |
| L94 (Other localized connective tissue disorders) | 20 (3.2%) | 3 (1.7%) | NS |
| L95 (Vasculitis limited to skin, not elsewhere classified) | 11 (1.8%) | 1 (0.6%) | NS |
| L97-L98 (Ulcer of lower limb, not elsewhere classified, other disorders of skin and subcutaneous tissue, not elsewhere classified) | 5 (0.8%) | 8 (4.5%) | .0005 |
| Certain infectious and parasitic diseases (I) | 35 (5.6%) | 18 (10.2%) | .002 |
| A46 (Erysipelas) | 12 (1.9%) | 9 (5.1%) | .019 |
| A51-A54 (Early syphilis, late syphilis, other and unspecified syphilis, gonococcal infection) | 11 (1.8%) | 8 (4.5%) | .031 |
| A18.4 (Tuberculosis of skin and subcutaneous tissue) | 4 (0.6%) | 0 (0%) | NA |
| B02 (Herpes zoster) | 5 (0.8%) | 0 (0%) | NA |
| B35 (Dermatophytosis) | 2 (0.3%) | 0 (0%) | NA |
| B86 (Scabies) | 1 (0.2%) | 1 (0.6%) | NS |
| Neoplasms (II) | 98 (15.7%) | 25 (14.2%) | NS |
| C84-C85 (Mature T/NK-cell lymphomas, Other and unspecified types of non-Hodgkin lymphoma) | 13 (2.1%) | 9 (5.1%) | .029 |
| C44 (Other malignant neoplasms of skin) | 63 (10.1%) | 12 (6.8%) | NS |
| D22 (Melanocytic nevi) | 9 (1.4%) | 1 (0.6%) | NS |
| D23 (Other benign neoplasms of skin) | 13 (2.1%) | 3 (1.7%) | NS |
| Diseases of the eye and adnexa (VII) | 27 (4.3%) | 1 (0.6%) | .017 |
| H02 (Other disorders of eyelid) | 14 (2.2%) | 8 (4.5%) | NS |
| Diseases of the musculoskeletal system and connective tissue (XIII) | 17 (2.7%) | 1 (0.6%) | NS |
suggested. As recommended by the American Academy of Dermatology psoriatic patients on biologic therapy continued their treatment. Similar to other inpatients with dermatoses, they were tested for COVID-19 the day before the admission and were obliged to use the face masks during their stay at the hospital.

Among all admitted patients during the COVID-19 pandemic, children and elderly patients were found to constitute significantly smaller groups of hospitalized patients in comparison to the previous year. Similarly, in Italy, less children with dermatological problems were treated during pandemic. It was clearly documented and widely distributed that COVID-19 has poorer prognosis and more severe course in the elderly. As a consequence, this group of subjects was less often admitted to our department. They were limited only to cases requiring emergency interventions. We also observed lower number of hospitalized females. Reznik et al showed that females reported higher level of COVID-19-related fear and this could be the explanations that females preferred to stay isolated at home and not to be treated as inpatients. It was clearly documented that, during the COVID-19 pandemic, fear of the unknown raised anxiety level in the general population as well as in healthcare workers.

In conclusion, to the best of our knowledge, this is a first comparative report on dermatological hospitalizations during the COVID-19 pandemic in Poland. We believe that sharing experience with colleagues in other countries could benefit with better care for dermatologic patients, especially in such extreme situations as COVID-19 pandemic.

**AUTHOR CONTRIBUTIONS**

Rafał Białyńcki-Birula—research concept and design; collection and/or assembly of data; writing the article; critical revision of the article; final approval of article. Iga Siemasz—collection and/or assembly of data; critical revision of the article; final approval of article. Agnieszka Otlewska—collection and/or assembly of data; critical revision of the article; final approval of article. Łukasz Matusiak—collection and/or assembly of data; critical revision of the article; final approval of article. Jacek C. Szepietowski—research concept and design; writing the article; critical revision of the article; final approval of article.

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**TABLE 2** (Continued)

| Period | 18/Mar/2019–May 19, 2019 (n) | 14/Mar/2020–May 15, 2020 (n) | P value |
|--------|----------------------------|----------------------------|---------|
| Q80 (Congenital ichthyosis) | 2 (0.3%) | 0 (0.0%) | NA |
| Q 82.2 (Mastocytosis) | 12 (1.9%) | 1 (0.0%) | NS |
| Q85 (Phakomatoses) | 3 (0.5%) | 0 (0.0%) | NA |
| Others | 10 (1.6%) | 3 (1.7%) | NS |
| Endocrine, nutritional, and metabolic diseases (IV) | | | |
| Diseases of the nervous system (VI) | | | |
| Diseases of the circulatory system (IX) | | | |
| Diseases of the digestive system (XI) | | | |
| Diseases of the genitourinary system (XIV) | | | |
| Factors influencing health status and contact with health services (XXI) | | | |

Abbreviations: NS, not significant; NA, not applicable.
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