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# Dermatological Emergency Cases in Geriatric Patients: A 3-year Multicenter Study of Three National Referral Hospitals in Indonesia

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**Abstract**

**BACKGROUND:** Dermatological emergency is a condition requiring immediate identification and treatment to reduce mortality and morbidity. There are several dermatoses resulting in emergency room (ER) visits frequently demonstrated by the geriatric population. However, there is a lack of data about elderly with dermatological presentation seen at the ER in Indonesia.

**AIM:** This retrospective study aims to identify the prevalence of dermatological emergency cases in the elderly at three national referral hospitals in Indonesia within 3 years.

**METHODS:** The sample was geriatric patients who came and/or were consulted by the ER to dermatology and venereology (DV) department. The data (e.g., age, sex, history taking, physical findings, and diagnoses) were collected from medical record from each hospital and presented as a descriptive data.

**RESULTS:** This study showed that there were only 37% of all geriatric emergency dermatological consultations from 2017 to 2020.

**CONCLUSION:** This study concluded that there were more than half non-emergent cases of 3-year period consultation. This condition may raise the need of better training about true emergency and standardized curricula of emergency dermatological presentations in geriatric patients.

## Introduction

A dermatological emergency is defined as a skin disease that calls for an early diagnosis, hospitalization, and careful monitoring to decrease mortality and morbidity, otherwise becoming an acute skin failure [1]. The elderly, an arising population estimated to reach 2 billion in number by 2050 [2], presented various dermatoses at ER from less urgent conditions, such as nail tinea, varicose veins, lentigo solaris, seborrheic keratoses, decubiti ulcer, tinea pedis, and seborrheic dermatitis, to more life-threatening ones [2], [3], [4]. Although most cases were resolved in outpatient setting, a previous research exhibited that dermatology patients, including patients from the geriatric population, accounted for 2–3% of emergency room (ER) visits, of which only 21 of 100 patients were considered as a true emergency [1], [5]. Similarly, other studies observed high percentage of outpatient dermatological cases seen in the ER [6], [7]. Notwithstanding the various presentations, there is a paucity of elderly's clinical data who admitted to the ER with skin problems, including in Indonesia.

This study is the first study in Indonesia that aims to identify dermatological presentations in elderly seen at the ERs of three tertiary hospitals. We hope to utilize the data for further investigation and analysis to achieve more effectivity and efficiency in providing medical training and services.

## Methods

This retrospective study included patients aged 60 and older admitted to the ER or consulted to the Dermatology and Venereology (DV) Department of Dr. Cipto Mangunkusumo Hospital (CMH), Persahabatan Central General Hospital (PGH), and Fatmawati Central General Hospital (FGH), between

2017 and 2020. CMH, PGH, and FGH all provide around the clock emergency medical services with around the clock on-site or on-call dermatologists. Geriatric patients presenting to the ER will undergo assessment and, if required, will further be consulted to a specialist in accordance with the initial diagnosis. Patients with any suspected dermatologic secondary diagnosis will also be consulted to the DV department. Diagnoses were encoded by the standardized hospital system using the latest ICD-10. This cross-sectional study used the total sampling method to collect the data sample. After obtaining research ethical approval and permission from FMUI and the hospitals, all data were collected from the medical records. Identity of all subjects was encoded due to privacy. The data extracted include gender, age, emergency diagnosis, comorbidities, department of origin, and consulted diagnosis. Data were then analyzed using Microsoft Excel 2020 and SPSSv25 and organized on tables. All the data handling were done by the authors.

## Results

As shown in Table 1, there were 71 geriatric patients who were consulted to the DV department from 2017 to 2020, consisting of 37 males and 34 females. We collected 166 dermatological problems as one patient may had multiple diagnoses. The mean age was 68.11 ± 7.25 years (range 60–89 years old). Typical comorbidities of patients seen in ER were others, diabetes, and hypertension, with the prevalence of 22.5%, 21.12%, and 19.7%, respectively. Internal medicine department made most of the dermatological consultations (47,9%). The three most frequently diagnosed dermatological conditions at the ER among the elderly were dermatitis (20.4%), infection (17.4%), and erythroderma (10.8%). The most common diagnosis for female group was dermatitis (18.20%)

**Tables 1: Baseline characteristics of subjects**

| Characteristic | Mean | SD |
|---|---|---|
| Age (year) | 68.11 | ± 7.25 |
| Characteristics | N | % |
| Gender | | |
| Male | 37 | 52.1 |
| Female | 34 | 47.9 |
| Comorbidities | | |
| Others | 16 | 22.53 |
| Diabetes | 15 | 21.13 |
| Hypertension | 14 | 19.71 |
| Cancer | 6 | 8.5 |
| Renal failure | 6 | 8.5 |
| Pneumonia | 5 | 7 |
| Post-operative | 5 | 7 |
| Tuberculosis | 4 | 5.63 |
| Department | | |
| Internal medicine | 35 | 49.3 |
| Neurology | 11 | 15.49 |
| Anesthesiology | 10 | 14.08 |
| Triage | 7 | 9.86 |
| Ophthalmology | 4 | 5.63 |
| Orthopedic | 2 | 2.82 |
| Psychiatry | 1 | 1.41 |
| Surgery | 1 | 1.41 |

and, for male group, infection (8.54%) (Table 2); both statistically significant.

**Table 2: Prevalence of diagnosis according to gender**

| Diagnosis | F | | M | | Total | p value† |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | |
| Infection | 15.00 | 0.39 | 14.00 | 0.37 | 29.00 | 0.00 |
| Dermatitis | 20.00 | 0.51 | 11.00 | 0.30 | 31.00 | 0.00 |
| Allergic drug eruptions | 9.00 | 0.24 | 5.00 | 0.13 | 14.00 | 0.02 |
| Ulcer | 7.00 | 0.19 | 5.00 | 0.13 | 12.00 | 0.01 |
| Erythroderma | 14.00 | 0.37 | 4.00 | 0.11 | 18.00 | 0.00 |
| Cellulitis | 4.00 | 0.11 | 3.00 | 0.10 | 7.00 | 0.06 |
| Bullous pemphigoid | 4.00 | 0.11 | 2.00 | 0.06 | 6.00 | 0.09 |
| Pemphigus vulgaris | 4.00 | 0.11 | 2.00 | 0.06 | 6.00 | 0.09 |
| Erythematosquamous dermatosis | 2.00 | 0.06 | 2.00 | 0.06 | 4.00 | 0.21 |
| Steven–Johnson syndrome | 5.00 | 0.13 | 1.00 | 0.04 | 6.00 | 0.09 |
| Pruritus | 3.00 | 0.10 | 1.00 | 0.04 | 4.00 | 0.20 |
| Urticaria | 2.00 | 0.06 | 1.00 | 0.04 | 3.00 | 0.31 |
| Cosmetic | 3.00 | 0.10 | | | 3.00 | 0.31 |
| Angioedema | 1.00 | 0.04 | | | 1.00 | 0.68 |
| TEN* | 1.00 | 0.04 | | | 1.00 | 0.68 |
| Vascular | 1.00 | 0.04 | | | 1.00 | 0.68 |
| Others | 14.00 | 0.37 | 6.00 | 0.17 | 20.00 | |

*TEN: Toxic epidermal necrolysis, †Data were analyzed using Chi-square.

We identified 62 emergency dermatological conditions in geriatric patients, which contributed to 37% of all geriatric dermatological consultation in 3-year period, as shown in Table 3. Of the nine categories, the two most common dermatoses were erythroderma (18 cases) and allergic drug eruptions (14 cases), while the other diagnoses varied between the hospitals. In contrast, there were no allergic drug eruption cases found at FGH.

**Table 3: Dermatological emergency cases at three tertiary hospitals (2017–2020)**

| Diagnosis | CMH | PGH | FGH | Total (%) |
|---|---|---|---|---|
| | n (%) | n (%) | n (%) | |
| Erythroderma | 5 (19.23) | 6 (37.5) | 7 (35) | 18 (29.03) |
| Allergic drug eruptions | 9 (34.6) | 5 (31.25) | | 14 (11.2) |
| Cellulitis | 7 (26.9) | | | 7 (11.29) |
| Bullous pemphigoid | 5 (19.23) | | 1 (5) | 6 (9.68) |
| Pemphigus vulgaris | | 1 (6.25) | 5 (25) | 6 (9.68) |
| Steven–Johnson syndrome | | 2 (12.5) | 4 20) | 6 (9.68) |
| Urticaria | | 2 (12.5) | 1 (5) | 3 (4.84) |
| Angioedema | | | 1 (5) | 1 (1.61) |
| TEN | | | 1 (5) | 1 (1.61) |
| Total | 26 (24.53) | 16 (44.44) | 20 (83.33) | 62 (37.35) |

The most prevalent dermatological emergency was allergic drug eruptions, which accounted for 34.6% at CMH. Meanwhile, in the other hospitals, erythroderma was the emergency skin disease that came most often to the ER.

The breakdown of 104 geriatric dermatological consultations is shown in Table 4. We categorized the diseases into eight different groups: Dermatitis, cosmetic, infection, pruritus, erythematosquamous dermatoses, vascular, and ulcer. CMH contributed to 76.9% consultations in the ER whereas FGH only contributed to <5%. There were no cellulitis cases reported at PGH because patients with cellulitis were consulted to other departments such as internal medicine and surgery department. Table 3 demonstrates that the most common dermatological consultation in the ER was dermatitis followed by infection. Among the dermatitis disease group, the most common type was irritant contact dermatitis seen in 15 patients. While in the infection group, cutaneous candidiasis was dominant among other infections, contributing to 11 cases. Comparing the data presented in Tables 2

**Table 4: Dermatology cases consulted in the emergency department at three tertiary hospitals (2017–2020)**

| Disease group | Diagnosis | CMH | PGH | FGH |
|---|---|---|---|---|
| | | n (%) | n (%) | n (%) |
| Dermatitis | Irritant contact dermatitis | 15 (19.2) | | |
| | Allergic contact dermatitis | | 1 (5) | |
| | Neurodermatitis | 2 (2.6) | | |
| | Asteatotic dermatitis | 2 (2.6) | | |
| | Intertriginous dermatitis | 1 (1.3) | | |
| | Other dermatitis conditions (herpetiformis, venenata, photocontact, and seborrheic) | 4 (5.1) | 6 (30) | |
| Cosmetic | Post-inflammatory hyperpigmentation | 1 (1.3) | 1 (5) | |
| | Vitiligo | 1 (1.3) | | |
| Infection | Cutaneous candidiasis | 11 (14.1) | | |
| | Secondary bacterial infection | 3 (3.8) | | |
| | Xerosis cutis (others) | 6 (7.7) | | |
| | Herpes zoster | 3 (3.8) | 3 (15) | |
| | Tinea cruris et corporis | | 1 (5) | |
| | Leprosy | | 1 (5) | |
| | Impetigo vesiculobullous | | | 1 (25) |
| Pruritus | pruritus et causa means pruritus due to dry skin (xerotic skin) | 1 (1.3) | 3 (15) | |
| Erythematosquamous dermatosis | Psoriasis (gutata and vulgaris) | 2 (2.6) | | 2 (50) |
| Vascular | Senile purpura | 1 (1.3) | | |
| Ulcer | Bacterial ulcer | 1 (1.3) | | |
| | Pressure ulcer | 6 (7.7) | 1 (5) | |
| | Diabetic ulcer | 2 (2.6) | 1 (5) | |
| | Trauma ulcer | 1 (1.3) | | |
| Others | | 17 (21.7) | 2 (10) | 1 (25) |
| Total | | 80 (100) | 20 (100) | 4 (100) |

and 3, consultation of false emergency skin problems in the ER was approximately twice higher than the emergency cases.

## Discussion

This study collected 166 dermatoses presenting to the ER, consisting of both emergency case and non-emergency case. The three most commonly seen diagnoses at the ER among the elderly were dermatitis, infection, and erythroderma, in contrast to a previous study which named skin infection as the most common diagnosis. The composition of female and male samples is almost similar to the previous study in Iran, in which both genders are almost equal in number (female 53% of total sample) [8]. This finding is supported by another study which reported that women are more at risk from skin diseases. This was in accordance with the fact that their main presenting complaint was worry of the sudden abnormality of their skin [8]. The top diagnosis (Table 1) for women was dermatitis and men was infection [7], similar to a prior study in Iran [9].

Allergic drug eruption was the most prevalent emergency dermatoses as shown in Table 2. This finding was similar with the previous research which found drug eruption as the main skin condition [10]. A study suggested that the risk of allergic drug eruption is age related and women are likely to develop it than men [11]. Second, there was a trend, supported by another study, showing an increased incidence of drug eruption in polypharmacy [12]. Allergic drug reactions also typically gave a strong reason to seek medical help at the ER due to its sudden onset, and the fact that it is often in association with other systemic symptoms. A study conducted in California showed that the most common dermatological problem presenting at the ER was erythema multiforme major or Stevens–Johnson syndrome (22%) and followed by drug eruption [13]. Another study from Singapore discovered that necrotizing fasciitis and SJS/TEN were the most common skin problems seen at the ER, accounting for 0.3% and 0.6% respectively [14]. In contrast with the largest tertiary hospital in Portuguese, the leading cause for admission was infection (34%) [15]. An epidemiology study about an emergency consultation found angioedema was the most common reason which accounted for 0.5% [16]. These differences among international studies were potentially due to difference in genetic patterns and environments, which could result in the difference in dermatoses distribution.

Among our non-emergent cases, the most typically consulted case was dermatitis followed by infection. Cutaneous candidiasis was the most common infection while dermatitis contact irritant was the most frequently encountered dermatitis. However, this result was different from Wakosa *et al*. who found infection to be the most prevalent among other diagnoses [17]. Other studies showed infection to be the most common as well, but the popular subgroup differed from our study [16]. The three most common skin diseases were shingles, dermatitis, and scabies in the elderly [18]. Another study, which result was similar with ours, revealed that contact dermatitis was the most seen dermatological problem in the ER (32.2%), much higher compared to our result. Infectious diseases constitute 26.1% of the cases [18]. Bancalari-Diaz *et al*. discovered that infection was the most common reason for hospital admission at a tertiary hospital in Spain [19]. Result variations [9], [14], [19] may be due to different sample population, race, sample size, and origin. Our finding is supported by Kotner *et al*. which stated that there were factors contributing dermatitis in age-related diseases [20]: (1) Delay in eliminating causative chemical substances, (2) decrease of tissue proliferation, regeneration, and/or repair, and (3) deterioration of skin barrier function. Moreover, the

reduction in air humidity, misuse or absence of personal care products, reduction of natural moisturizing factors, and lipid are also contributing factors, particularly in the geriatric population [20].

Our study revealed that more than half of the cases consulted in the ER were not true emergency cases. This result was similar with a study which showed that only 2.1% of all dermatological cases present in the ER were true emergency cases [6]. Another study showed that 59.2% of patients in the ER were discharged with no further care and only 2.7% were put under observation in the ER. Only around 0.8% of patients returned after being discharged [9]. This may raise a question about the motivation of seeking help from the ER instead of going to the outpatient clinic. A study in France reported that the main reason was their concern about the pain, discomfort, or anxiety about the course of the diseases related to their skin issues, and the ER was considered to offer the most time-efficient solutions [9].

In our study, the majority of non-emergency dermatology consultations from the ER were found in CMH. The probable reason behind is the availability of on-site dermatology residents, whereas FGH and PGH only provide on-call dermatologists. Moreover, patients who came with non-dermatologic emergency were often consulted by another department to the DV department for their secondary diagnosis. An interesting fact is that a majority of geriatric patients in Indonesia require familial assistance, yet family members are many a time not available during working hours, so they are brought to ER instead. This is highly unnecessary and places a heavier burden on the national health insurance used by a large percentage of patients. A report which analyzed the inpatient dermatologic consultations revealed that 71.5% cases do not, in fact, entail hospital admission. This emphasizes the need for training designed to help medical students and residents of various medical departments better identify cases of true dermatological emergency [21], potentially through a standardized curricula and clinical practice guidelines made in collaboration with other departments. Another possible option is the use of telemedicine in dermatological emergency cases. Dermatology telemedicine has been established for years as it can provide a dermatological consultation in a hospital with no on-site dermatologists. A report from Singapore demonstrated that teledermatology has improved time efficiency in diagnosis of dermatologic conditions and potentially reduced unnecessary admissions [22]. In India, teleconsultation using a popular social media, WhatsApp, could accurately diagnose 93.45% of cases. Whether images were obtained from social media or standard teledermatology services was not found to cause significant difference in the diagnosis accuracy. In addition, visual inspection of the skin lesion is a major part of making dermatological diagnosis, as well as to decide whether the case is a true emergency. A pilot study by Villa *et al.* showed 100% similarity between an initial telemedicine assessment and a direct clinical assessment made by dermatologists. The treatment time was faster in the telemedicine group [23]. Hereby, we recommend a more frequent use of teledermatology, either through standardized telemedicine system or social media such as WhatsApp, in the ER setting.

## Conclusion

More than half of dermatology cases in geriatric patients seen in the ER were not emergency cases and thus did not need any dermatologic referral. The most common dermatoses consulted in the ER were dermatitis and superficial skin infections. Our finding suggest a need in improving emergency dermatology education for general practitioner to limit unnecessary consultation and therefore, improving healthcare system effectiveness and cost-efficiency in ER settings. Telemedicine may also be utilized to screen or examine the consulted emergency cases. By applying these improvements, emergency services may provide needed medical care for true emergency dermatology cases both in elderly and non-elderly populations.

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