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CLINICAL PROFILE OF PYODERMA PATIENTS AT THE DERMATOLOGY AND VENEREOLOGY OUTPATIENT CLINIC, UNIVERSITAS AIRLANGGA TEACHING HOSPITAL: A RETROSPECTIVE STUDY

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ABSTRACT

Background: Pyoderma refers to a group of bacterial infectious diseases involving the skin and follicular structures commonly caused by infection with Gram–positive bacteria. Pyoderma infections are among the most common dermatologic diseases in tropical countries such as Indonesia. Pyoderma patients present with diverse signs and symptoms in clinical manifestations and systemic infection. Pyoderma imposes a substantial disease burden in resource-poor communities, leading to serious post-infection complications. Therefore, comprehensive research regarding the clinical profile of pyoderma patients is crucial.

Materials and Methods: This study is a retrospective descriptive analysis using secondary data extracted from medical records at the Dermatology and Venereology Outpatient Clinic of Universitas Airlangga Teaching Hospital from 2023 – 2025.

Results: A total of 119 patients were included in the study, pyoderma being the most common diagnosis (39.5%). Among these cases, cellulitis represented the most frequent type of pyoderma (22.7%). This study reported that 58% of cases occurred in females, with the condition affecting a broad range of age groups. The highest proportions were observed in the early elderly age group (56–65 years) at 19.3%, followed by the late elderly group (>65 years) at 15.1% and the toddler age group (0–5 years) at 13.4%. Primary lesions such as macules (44.5%) and pustules (25.2%) are frequently observed, while secondary lesions like erosions (47.1%) and crusts (25.2%) are commonly found. Antibiotic treatment was the most common intervention given, both systemic and topical. Normal saline, antihistamines, and topical steroids were also commonly prescribed.

Conclusion: This study highlights the characteristics of pyoderma cases in the Dermatology and Venereology Outpatient Clinic, Universitas Airlangga Teaching Hospital. Among the type of pyoderma, cellulitis was the most common clinical diagnosis. Pyoderma was more common in females and occurred across a broad age range, with the highest incidence in the early elderly population. Primary lesions such as macules and pustules were commonly observed, while secondary lesions such as erosions and crusts were frequently present. Systemic and topical antibiotics were the most frequently used therapies. The findings of this study may help enhance patient care, support future studies, and improve local health strategies for managing skin infections.

***Keywords*:** Pyoderma, Retrospective Studies, Clinical profile, Indonesia, Good health and well-being

INTRODUCTION

Pyodermas are defined as a bacterial infection that gives rise to lesions that break the skin barrier. Infection of pyoderma may occur at the level of epidermis and dermis [1]. Pyoderma can be found in high and low-resource countries. Its incidence, however, is significantly higher in tropical climates and among populations with low hygiene,

malnutrition, and overcrowding [2]. Regions such as India and Indonesia account for a significant amount of outpatient dermatological consultations, especially among children [3,4]. Individuals living in developing countries, such as Indonesia, remain highly susceptible to bacterial skin infection due to factors such as inadequate hygiene, weakened skin barriers, high population density, and limited education [5]. Humidity also plays a role in skin infections. Climate change causes ambient humidity to cause infectious diseases to flourish [6]. Pyoderma is classified as either primary or secondary. Primary pyodermas are impetigo, folliculitis, furuncle, carbuncle, ecthyma, erythrasma, and sycosis barbae. Secondary pyodermas constitute tropic ulcer, infected pemphigus, infected contact dermatitis, infected scabies, and various other dermatoses infected with organisms [7]. According to a study conducted in Malang, Indonesia, the incidence of pyoderma is most prevalent in high school males, with impetigo being the most common form of pyoderma found [8]. Treatment of pyoderma typically involves systemic and topical antibiotics. Systemic antibiotics such as amoxicillin and clavulanic acid are given when topical antibiotics are insufficient [9]. Localized epidemiological data are essential to broaden the scope and guide possible effective treatment strategies.

MATERIALS AND METHODS

Design and Population

This study is a retrospective analysis conducted on cases of pyoderma treated at the Dermatology and Venereology Outpatient Clinic, Universitas Airlangga Teaching Hospital, between 2023 – 2025. Data was extracted from medical records of patients with diagnosed pyoderma, including conditions such as impetigo, ecthyma, folliculitis, furuncle and carbuncle, erysipelas, and cellulitis. The study included 119 patients presenting with various types of pyodermas. Data is categorized by age, gender, lesion type, and treatment modality.

Inclusion Criteria

Patients diagnosed with Pyoderma who were treated and logged with the following diagnoses: Impetigo, ecthyma, folliculitis, furuncle and carbuncle, erysipelas, and cellulitis

Exclusion Criteria

Cases of duplicated data and repeated visits to the outpatient clinic were excluded from this study. Only the first visit is included.

Sampling Method

This study was conducted using consecutive sampling to select cases that met the inclusion criteria. Data on demographics, clinical manifestations, lesion types, and treatment methods were extracted from the medical records of eligible patients.

Data Collection

Data were collected retrospectively from the Dermatology and Venereology Outpatient Clinic, Universitas Airlangga Teaching Hospital's electronic medical records. The following datasets were extracted:

Clinical Diagnosis: Type of pyoderma, including impetigo, ecthyma, folliculitis, furuncle-carbuncle, erysipelas, cellulitis

Demographic Information: Age and Gender

Clinical Manifestation: Primary and secondary lesions

Treatment Data: Prescribed topical and systemic treatments, including antibiotics, steroids, moisturizer, and antifungal.

Data Analysis

Data were entered into Microsoft Excel and analyzed using descriptive statistics. Frequency and percentage distributions for included variables are visualized by the use of tables to present.

Ethical Considerations

Ethical approval was obtained from the Ethical Committee of Universitas Airlangga Teaching Hospital. Patient confidentiality was strictly maintained by keeping the data anonymous.

Study Timeline

This study was conducted from August 2025 to November 2025

RESULTS

Clinical Diagnosis Distribution

A total of 119 patients met the criteria for this study. Pyoderma was the most common diagnosis, occurring in 47 patients (39.5%) and cellulitis was the most frequent clinical type of pyoderma (22.7%), followed by furuncle and carbuncle (17.6%) (Table 1).

Table 1. Patient Demographic

	Diagnosis N (%)							Total
	Pyoderma	Impetigo	Ecthyma	Folliculitis	Furuncle Carbuncle	Erysipelas	Cellulitis	
N	47(39.5)	11(9.2)	2(1.7)	9(7.6)	21(17.6)	2(1.7)	27(22.7)	119(100)

Gender Distribution

119 patients were observed, and the results showed that the majority were female (58%). Cellulitis was found affecting females (59.3%) compared to males (40.7%). Furuncles and carbuncles were the same, with females showing a higher percentage (71.4%). On the other hand, impetigo and folliculitis showed higher male prevalence at 63.6 % and 66.7% respectively. Erysipelas and ecthyma were found with balanced distribution at 50% in each gender (Table 2).

Table 2. Gender Distribution

Gender	Diagnosis N (%)							Total
	Pyoderma	Impetigo	Ecthyma	Folliculitis	Furuncle Carbuncle	Erysipelas	Cellulitis	
Male	18(38.3)	7(63.6)	1(50)	6(66.7)	6(28.6)	1(50)	11(40.7)	50(42)
Female	29(61.7)	4(36.4)	1(50)	3(33.3)	15(71.4)	1(50)	16(59.3)	69(58)
Total	47(100)	11(100)	2(100)	9(100)	21(100)	2(100)	27(100)	119(100)

Age Distribution

Among all patients, the highest proportion was observed in the early elderly age group (56–65 years), with 23 patients (19.3%). This was followed by the late elderly group (>65 years) at 15.1% and toddlers (0–5 years) at 13.4%. Based on this observation, pyoderma affects a wide range of ages (Table 3).

Table 3. Age Distribution

Age Group	Diagnosis N (%)							Total (%)
	Pyoderma	Impetigo	Ecthyma	Folliculitis	Furuncle Carbuncle	Erysipelas	Cellulitis	
0-5	7(14.9)	8(72.7)	0(0)	0(0)	1(4.80	0(0)	0(0)	16(13.4)
5-11	6(12.8)	1(9.1)	1(50)	0(0)	0(0)	0(0)	0(0)	8(6.7)
12-16	2(4.3)	0(0)	1(50)	0(0)	0(0)	0(0)	1(3.7)	4(3.4)
17-25	7(14.9)	0(0)	0(0)	2(22.2)	3(14.3)	0(0)	3(11.1)	15(12.6)
26-35	4(8.5)	1(9.1)	0(0)	1(11.1)	4(19)	0(0)	1(3.7)	11(9.2)
35-45	3(6.4)	0(0)	0(0)	2(22.2)	2(9.5)	0(0)	4(14.8)	11(9.2)
46-55	5(10.6)	0(0)	0(0)	0(0)	4(19)	0(0)	4(14.8)	13(10.9)
56-65	7(14.9)	1(9.1)	0(0)	3(33.3)	3(14.3)	2(100)	7(25.9)	23(19.3)
>65	6(12.8)	0(0)	0(0)	1(11.1)	4(19)	0(0)	7(25.9)	18(15.1
Total	47(100)	11(100)	2(100)	9(100)	21(100)	2(100)	27(100)	119(100)

Lesion Types

Primary Lesion

Primary lesions were observed in this study, macules and pustules were found to be the most common lesion types at 44.5 % and 25.2% respectively. For cellulitis, macules were the most common primary lesion found in 23 patients (85.2%), followed by pustules and bullae, with both at 7.4%. In cases of furuncles and carbuncles, the primary lesion found was nodules (61.9%) and macules (28.6%). Impetigo mainly presents as papules (36.4%) and pustules (27.3%). Folliculitis primarily presents as papules (77.8%) and pustules (22.2%). Erysipelas presents as macules and papules in both cases at 50% and similarly, ecthyma presented macules at 50% (Table 4).

Secondary Lesion

In the secondary lesion aspect, erosions (61.7%) and crusts (34%) were most common in cases of pyoderma. Similarly, erosions (37%) and crusts (14.8%) were also frequently found in cellulitis, with squama and ulcer showing high frequency at 14.8%. Furuncles and carbuncles. On the other hand, displayed ulcer and crusts as the majority of secondary lesion presentation. Impetigo showed major erosion and crust presentations at 72.7% and 45.5% respectively. Lichenification is reported in a minority of patients, with only 4 patients presenting with pyoderma and 1 with cellulitis. Folliculitis exclusively showed a presentation of erosions (44.4%), and erysipelas also presented a similar exclusive erosion presentation (100%). While ecthyma cases presented with crust, excoriation, and ulcer, each at 50% (Table 4).

Table 4. Lesion Type Distribution

Type of Lesion	Diagnosis N (%)							Total
	Pyoderma (n=47)	Impetigo (n=11)	Ecthyma (n=2)	Folliculitis (n=9)	Furuncle Carbuncle (n=21)	Erysipelas (n=2)	Cellulitis (n=27)	
Primary Lesion								
Maculae	20(42.6)	2(18.2)	1(50)	0(0)	6(28.6)	1(50)	23(85.2)	53(44.5)
Papule	14(29.8)	4(36.4)	0(0)	7(77.8)	3(14.3)	0(0)	0(0)	28(23.5)
Nodule	7(14.9)	1(9.1)	0(0)	1(11.1)	13(61.9)	0(0)	1(3.7)	23(19.3)
Pustule	19(40.4)	3(27.3)	0(0)	2(22.2)	4(19)	0(0)	2(7.4)	30(25.2)
Vesicle	3(6.4)	1(9.1)	0(0)	0(0)	0(0)	0(0)	0(0)	4(3.4)
Bullae	1(2.1)	0(0)	0(0)	0(0)	0(0)	1(50)	2(7.4)	4(3.4)
Plaque	3(6.4)	0(0)	0(0)	0(0)	1(4.8)	0(0)	3(11.1)	7(5.9)
Secondary Lesion								
Squama	11(23.4)	2(18.2)	0(0)	0(0)	2(9.5)	0(0)	4(14.8)	19 (16)
Crusts	16(34)	5(45.5)	1(50)	0(0)	4(19)	0(0)	4(14.8)	30(25.2)
Erosion	29(61.7)	8(72.7)	0(0)	4(44.4)	3(14.3)	2(100)	10(37)	56(47.1)
Excoriation	2(4.3)	2(18.2)	1(50)	0(0)	1(4.8)	0(0)	0(0)	6(5)
Ulcer	2(4.3)	1(9.1)	1(50)	0(0)	4(19)	0(0)	4(14.8)	12(10.1)
Lichenification	4(8.5)	0	0(0)	0(0)	0(0)	0(0)	1(3.7)	5(4.2)

Note: One patient may present with more than one lesion type

Treatment Distribution

Topical Therapy

The majority of patients received topical antibiotics (86.6%). Topical treatments categorized as others, including normal saline, were also commonly used to 64 patients (53.8%), followed by topical steroids, which were prescribed to 28 patients (23.5%) (Table 5).

Table 5. Treatment Distribution

Type of Therapy	Diagnosis N (%)							Total
	Pyoderma (n=47)	Impetigo (n=11)	Ecthyma (n=2)	Folliculitis (n=9)	Furuncle Carbuncle (n=21)	Erysipelas (n=2)	Cellulitis (n=27)	
Topical Therapy								
Topical Antibiotic	45(95.7)	11(100)	2(100)	7(77.8)	16(76.2)	2(100)	20(74.1)	103(86.6)
Topical Steroid	12(25.5)	3(27.3)	0(0)	2(22.2)	3(14.3)	0(0)	8(29.6)	28(23.5)
Moisturizer	2(4.3)	1(9.1)	0(0)	0(0)	0(0)	0(0)	3(11.1)	6(5)
Antifungal	6(12.8)	2(18.2)	0(0)	0(0)	2(9.5)	0(0)	0(0)	10(8.4)
Others	27(57.4)	8(72.7)	2(100)	3(33.3)	4(19)	1(50)	19(70.4)	64(53.8)
SystemicTherapy								
Systemic Antibiotic	31(66)	7(63.6)	2(100)	5(55.6)	17(81)	2(100)	25(92.6)	89(74.8)
Antihistamine	19(40.4)	3(27.3)	1(50)	6(66.7)	5(23.8)	1(50)	9(33.3)	44(37)
Oral Non Steroid	9(19.1)	0(0)	1(50)	1(11.1)	7(33.3)	2(100)	11(40.7	31(26.1)
Oral Steroid	1(2.1)	0(0)	0(0)	0(0)	0(0)	0(0)	2(7.4)	3(2.5)
Others	1(2.1)	0(0)	0(0)	1(11.1)	1(4.8)	0(0)	2(7.4)	5(4.2)

Note: One patient can be treated with more than one therapy

Systemic Therapy

Similar to topical therapy, antibiotics were the most commonly prescribed treatment (74.8%). Antihistamines were given to 44 patients (43.7%). Oral non–steroidal drugs such as ibuprofen and mefenamic acid were prescribed to 31 patients (26.1%) (Table 5).

DISCUSSION

In this study of 119 patients over the period of 2023 – 2025, we evaluated the distribution and characteristics of skin infections, including pyoderma, cellulitis, furuncles/ carbuncles, impetigo, folliculitis, erysipelas, and ecthyma. The findings reported will be discussed with existing literature. Pyoderma was found to be the most common diagnosis (39.5%), followed by cellulitis (22.7%) and furuncle/carbuncle (17.6%). This finding is supported by a study conducted by the global analysis of bacterial skin diseases, which found that amongst skin diseases, bacterial skin infections, which mainly include cellulitis and pyoderma, account for a massive proportion [10]. This research found that pyoderma was most prevalent in female patients (58%) compared to male patients (42%). Uniquely, this study contradicts previous studies conducted. For example, studies conducted in India mainly report male dominance compared to female predominance. A study in India reported that 57.57% male patients were diagnosed with pyoderma compared to female patients (42.42%) [3]. This current study reported that cases of pyoderma were distributed mainly in the early elderly age group. This finding is supported by a previous study that found in 33 cases of pyoderma, the majority of patients were above 40 years of age. The development of infection may be explained due to elderly patients neglecting the disease (3). Patients diagnosed with pyoderma were distributed evenly across age groups, with the 0–5 years, 17–25 years, and 56–65 years age groups each accounting for 14.9% of cases. Impetigo has been reported as the most common type of pyoderma in younger age groups, accounting for 48.61% of cases in a previous study (12). This is consistent with the findings of the present study, in which the majority of younger patients presented with impetigo (72.7%). Our findings reported that macules and pustules were the most common primary lesions in patients presenting with pyoderma at 42.6% and 40.4% respectively. This finding is consistent with a previous study that reported pustules as the dominant lesion in pyoderma patients, which indicates superficial bacterial infection caused by

Staphylococcus Aureus and *Streptococcus Pyogenes* [13].

This study also found that macules were present in the majority of cases with cellulitis (85.2 %), with other lesions such as plaque (11.1%) and pustules (7.4%) appearing less frequently. This finding is consistent with studies that cellulitis primarily presents with inflamed and erythematous skin, which may progress to more severe forms [14].

Furuncles and carbuncles, on the other hand, were mainly presenting with nodules (61.9%), pustules (19%), and plaques (4%), which may reflect deeper and localized skin infection. While folliculitis mainly presents with papules (77.8%) and pustules (22.2%), which show its characteristic involvement of inflaming the hair follicles [15]. This study reported that erosions were commonly found in impetigo (72.7%), pyoderma (61.7%), and cellulitis (37%). Similarly, crusts were also commonly found in pyoderma and impetigo at 34% and 45.5% respectively. This finding may be the result of the breakdown in the skin barrier and may increase the risk of bacterial infection [16].

The presence of crust may signal progression towards healing. They are also associated with secondary infections and may delay recovery. Ulcer was predominantly found in patients with cellulitis (14.8%), which represents a deeper stage of infection where it requires more intensive management. Formation of an ulcer is an indicator of advanced disease [17]. Excoriation is observed in patients presenting with impetigo and pyoderma at 18.2% and 4.3% respectively. If left untreated, excoriation may cause infection and scarring [18]. Management of secondary skin infections primarily focuses on controlling bacterial growth. Antibiotics were the most commonly prescribed treatment in this study. The majority of patients diagnosed with pyoderma received topical and systemic antibiotics at 95% and 66% respectively. This finding is consistent with a study conducted in the United States, which showed that antibiotics were the most prescribed treatment consistently for 8 years in patients presenting with skin infections [19].

Normal saline was also widely used in this study, listed as others in the table. Normal saline is used in 64 patients (53.8%). This finding is consistent with previous research, which stated that normal saline is the most widely accepted irrigant for wound infection [20]. Topical steroids were often prescribed for patients in this study, 28 (23.5%). This is consistent with previous studies that topical steroids are effective for inflammatory skin diseases when used within a short treatment period. However, its use must be carefully monitored due to local side effects such as atrophy, striae, and rosacea [21].

In systemic therapy, antihistamines are the second most prescribed treatment after antibiotics; all patients in this study received antihistamines. Antihistamines are most known for their effect to suppress pruritus typical in cases of angioedema and can reverse vascular effects and induce pain control [22]. Oral non–steroids are also commonly prescribed in this study; most patients also received nonsteroidal anti-inflammatory drugs. Nonsteroidal anti-inflammatory drugs are frequently used to manage mild to moderate pain, which may be present in cases of pyoderma [23].

CONCLUSION

This study provides a comprehensive report of the characteristics and treatment distribution of pyoderma at the Dermatology and Venereology Outpatient Clinic, Universitas Airlangga Teaching Hospital. Pyoderma was more commonly found in females and occurred across a wide age range, with the highest incidence observed in the early elderly age group. Among the types of pyoderma, cellulitis was the most frequent clinical diagnosis. Macules and pustules were the predominant primary lesions, while erosions and crusts were the most commonly observed secondary lesions. Topical and systemic antibiotics were the most frequently administered treatments. Overall, these findings offer valuable insights into the clinical presentation and therapeutic management of pyoderma in a local healthcare setting. The results of this study may help optimize patient care, guide future research, and support the development of improved local health strategies for managing skin infections.

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Competing Interests

The authors have no competing interests to declare.

Informed Consent

Not applicable.

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