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Dermatological Infectious Diseases Prevalence at Dermatology-Venereology Outpatient Clinics of Hospitals in Medan

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ABSTRACT

Introduction. Skin infections are common in developing countries but are often not considered a significant health problem. One cause of this condition is a lack of epidemiological information about the prevalence and/or severity of the disease. This study aims to determine the prevalence and proportion of infectious skin diseases based on gender and age in the teaching hospitals at the Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia. **Methods.** A descriptive-retrospective method was used in this study and the data were obtained from the medical records of patients at the dermatology and venereology polyclinic at Adam Malik Hospital and Prof. Dr. Chairuddin P. Lubis Universitas Sumatera Utara Hospital between 2017 and 2019. **Results.** A total of 12,686 patients were enrolled in this study, 26% were diagnosed with infectious skin disease with a total of 3,297 cases. Based on gender, patients were more dominated by men (55%) than women (45%). Most patients with infectious skin diseases were in the late adolescent age group or 17–25 years (20.4%) and the least were in the 0–4 years age group (3.2%). Furthermore, fungi were the dominant causative agent, which accounts for 51.5% of all cases. **Conclusion.** Infectious skin disease is a skin disease that is often found, especially in men and the age group of 17–25 years.

1. Introduction

Skin infections are common in developing countries, especially in the tropical region.[1] Despite their prevalence, the disease is often not considered a significant health problem (except for leprosy). Furthermore, they are rarely treated using population-based disease control programs due to competing priorities as well as a lack of epidemiological information about the prevalence and/or severity of these conditions.[2]

In hot climates, skin diseases are generally caused by infections[3], and a study in Jakarta, Indonesia revealed that they are still the most common skin diseases.[4] This finding is in line with Wonosari that infectious diseases were still the most common skin diseases in dermatology and venereology polyclinic.[5]

The actual prevalence of bacterial skin infections has not been fully assessed because most of these diseases can heal naturally between 7–10 days.[6] The World Health Organization (WHO) stated that there is a continuous decrease in the rate of leprosy and a total of 12,441 cases have been reported in Indonesia. However, several studies revealed that these numbers can increase due to many undiagnosed cases.[7] Superficial mycoses are relatively common in tropical countries, including Indonesia where they affect more than 20–25% of the population, hence, they are the most common cause of infection.[8,9]

Epidemiological studies are essential for understanding diseases, including skin conditions. However, detailed data on infectious and infested skin diseases in Indonesia, even in large cities like Medan, remain limited. This gap underscores the importance of epidemiological research in determining the prevalence of these diseases, assessing their impact, and guiding effective prevention strategies.

2. Methods

This is a descriptive-retrospective study based on

patient medical record data. All data was taken from patients who visited the Dermatology and Venereology Polyclinic of Adam Malik Hospital and USU Hospital between January 1, 2017 to December 31, 2019. All diagnoses, gender, and age were recorded according to the information in the medical record at each patient visit. Data were analyzed using Microsoft Excel and SPSS software. Furthermore, this study was approved by the Health Research Ethics Committee of the Universitas Sumatera Utara with reference number 65/KEP/USU/2020.

3. Results

Table 1 shows that a total of 12,686 patients visited the dermatology and venereology polyclinic of Haji Adam Malik Hospital and Prof. Dr. Chairuddin P. Lubis USU Hospital between January 1, 2017 to December 31, 2019. Furthermore, 3,297 were diagnosed with infectious skin disease accounting for 26% of the total population.

Table 2 revealed that the patients consist of 55% male and 45% female with a total of 1,813 and 1,484 patients, respectively. Meanwhile, Table 2 also shows that the 17–25 years age group was the most affected with a total of 641 people accounting for 19.44% of the population, while the 0–4 years group was the least affected.

Based on Table 3, 51.5% of infectious skin diseases were caused by fungi in a total of 1,697 patients, followed by mycobacteria accounting for 13.8% with 454 affected people. Also on the list are bacterial infections, which were found in 432 patients and accounted for 13.1% of all cases. Furthermore, 11% of skin diseases were caused by viruses with a total of 352 people. 352 patients were infected by parasites representing 10.6% of all cases.

Table 1. The total number of visits and patients with skin infections caused by bacteria, mycobacteria, fungi, viruses, and parasite

Year	Total of Patients	Total of Skin Infection Patients
2017	3,535	988
2018	4,634	1,192
2019	4,517	1,117
Total	12,686	3,297

Table 2. Prevalence of skin infections based on gender and age

Skin Infection Patients	Age									Total
	0–4 years	5–11 years	12–16 years	17–25 years	26–35 years	36–45 years	46–55 years	56–65 years	>65 years	
Male	50	143	233	372	238	233	199	184	161	1,813
Female	57	101	148	269	196	179	240	151	143	1,484
Total	107	244	381	641	434	412	439	335	304	3,297

Table 3. Prevalence of skin infections based on causative agent

Causes of Skin Infections	2017	2018	2019	Total
Fungi	557	569	571	1,697
Mycobacteria	187	170	97	454
Bacteria	86	172	174	432
Virus	90	150	122	362
Parasite	68	131	153	352
Total	988	1,192	1,117	3,297

Table 4. Most diagnoses for each causative agent

Skin Infection Causing Agent	Diagnosis	Total
Bacteria	Folliculitis	150
Mycobacteria	Morbus Hansen	428
Fungi	Tinea Corporis	430
Virus	Herpes Zoster	162
Parasite	Scabies	320

Table 4 shows the most diagnosed disease based on their causal agent where folliculitis was the dominant infection caused by bacteria in a total of 432 people or 34.7% of all cases. Furthermore, Morbus Hansen was the prevalent condition caused by mycobacteria in 428 patients among 454 cases, and it accounted for 94.3% of all cases, 430 people were diagnosed with tinea corporis among 1,697, and it accounted for 25.3% of all skin diseases. Herpes zoster was the most common condition caused by viruses with a total of 162 people among 362 cases, which represents 44.8% of the population. Scabies was the prevalent infection caused by parasites in a total of 320 patients among 352, and it accounted for 90.9% of all cases.

4. Discussion

The results revealed that a total of 12,686 patients visited the dermatology and venereology polyclinic between 2017 and 2019. Furthermore, 3,297 were diagnosed with infectious skin disease accounting for 26% of the population, as shown in Table 1. Similar findings were also obtained in Thailand between 2015-2019 where 36.2% of the patients had skin and subcutaneous tissue infections, while 31.3% and 13.5% were diagnosed with dermatitis and urticaria, respectively.[10] Meanwhile, a study in India revealed that 39.54% of the sample population had infections.[11] A similar study in Pakistan also showed that infectious skin and sexually transmitted diseases accounted for 28.16% of the patients with the condition.[12] Skin diseases caused by bacteria and fungi are more prevalent in the tropics. Meanwhile, others caused by parasites, such as scabies are less common due to variations in the number of parasites. The dominance of these infections in tropical countries is caused by factors supporting their spread and pathogenesis, such as climate including hot and humid conditions as well as population density.[3] Previous studies also reported that poor socioeconomic status, low levels of literacy, poor hygiene, population density, and high interpersonal contacts can also contribute to the high prevalence.[13]

Based on gender, there were more male patients with infectious skin disease than the female with a total of 1,813 and 1,484 people, as shown in Table 2. Furthermore, women tend to experience more skin disorders in the form of psychosomatic disorders, pigmentation, hair, autoimmune, and allergies compared to men. However, the effect of gender differences on the incidence of these diseases is still unknown. This is due to the existence of distinct skin structures and physiology as well as the influence of sex hormones, ethnic background, sociocultural behavior, and environmental factors.[14]

Table 2 also showed that the 17–25 years age group was dominant and they often experience infectious skin diseases. A previous study in Nigeria reported that these infections are least common among people between aged 16–25 years compared to others. The variation between the age groups is associated with skin growth, and development as well as complex hormonal changes that occur at various stages of life.[13]

Based on Table 3, the most common cause of skin infection was fungi, followed by mycobacteria, bacteria, viruses, and parasites. This finding was in line with the Global Burden Disease Study in 2019, which found that among 4,859,267,654 new skin and subcutaneous disease cases that were identified, most were fungal (34.0%) and bacterial (23.0%) skin diseases.[15] A study at Jagakarsa Hospital, Jakarta revealed that superficial fungal diseases were the most common skin infection 47.63%), followed by parasite, bacterial and viral infections with prevalence rates of 26.54%, 19.19%, and 6.64%, respectively.[4]

Table 4 showed that folliculitis is the most skin infection caused by bacteria, which accounts for 34.7% of all cases by the agent. This finding is inconsistent with a study in Jakarta where furunculosis had the highest prevalence (34.57%).[4] Meanwhile, Kar reported that the most common bacterial infection was pyoderma where impetigo had the highest diagnosis of 308 amongst 12,910 patients.[11] Differences in bacterial skin infection patterns based on the causative organism are also evident in the tropics. In colder environments, *Staphylococcus aureus* is the main cause of skin conditions, while Group A streptococcal diseases are more prevalent in the tropics.[3]

The most common infection caused by mycobacteria was Morbus Hansen, as shown in Table 4. Kar in India also revealed that the disease is more often diagnosed than cutaneous tuberculosis.[11] Over the decades, Morbus Hansen has been a scourge in many tropical countries. Consequently, several efforts have been made to curtail its spread through elimination programs, but it is still categorized as neglected in the tropics (Neglected Tropical

Diseases). WHO has also issued a handbook, which was published in 5 languages as a program to treat the disease. However, India and Brazil are still reporting a relatively large number of cases and it is also possible that the current official figures from other countries are lower than the actual situation.[3]

Table 4 shows that the most common fungal skin infection diagnosis was tinea corporis, which accounted for 25.3% of all cases. A study in Jakarta also reported that diseases caused by fungi had the highest prevalence among infectious skin diseases.[4] A study in Kolkata also found a similar result where tinea corporis was the most common dermatophyte infection.[11]

The clinical pattern of fungal infections in tropical countries is slightly different from that of other temperate regions. Dermatophyte conditions, such as onychomycosis and tinea pedis often occur in cold climates, while tinea capitis and corporis are common in the tropics. Furthermore, there are variations in the infection patterns and the causal organism in various regions in tropical countries. The diseases are often caused by a lack of proper treatment, the use of low-quality drugs as well as gene mutations.[3]

Table 4 revealed that herpes zoster was the most common diagnosis of viral skin diseases. This result is consistent with a study in Jakarta where herpes zoster had the highest prevalence among viral skin diseases (46.43%).[4] A similar study in Kolkata also showed that it was the most common viral skin infection, which is not sexually transmitted.[11]

Based on Table 4, scabies were the most common diagnosis for infections or infestations caused by parasites. Similar findings were also obtained in Kolkata, India where it had the highest prevalence of 14.07% among parasitic and protozoan infections with a total of 1,816 patients.[11]

Scabies has a prevalence of over 5% in tropical countries, and a value of 10% was recorded in Ethiopia as well as the Western Pacific. Consequently, it requires special controls as it has been included in the list of Neglected Tropical Diseases. Several studies have also revealed that streptococcal skin infections are related to scabies. This complex relationship occurs because *Sarcoptes scabiei* produces substances, such as Scabies Mite Inactivated Protease Paralogues (SMIPP), which can interfere with the complement activation and phagocytosis. This then has a direct impact on the development of streptococcal infection.[3]

The limitation of this study is that the source of the data was from hospital visits, hence, it does not provide a definite description of the pattern of skin infections in the community. Furthermore, socioeconomic factors can also affect patient visits to hospitals.

5. Conclusion

The results showed that 26% of the patients enrolled in this study had skin infections. The highest prevalence was found in men around 17–25 years old. Furthermore, the dominant cause of these diseases was fungi. The most diagnosed condition caused by the various agents, namely bacteria, mycobacteria, fungi, viruses, and parasites were folliculitis, morbus Hansen, tinea corporis, herpes zoster, and scabies respectively. Further studies must be carried out to determine factors related to the high prevalence of infectious skin diseases in Indonesian communities.

6. Author Contribution

All authors have contributed to all processes in this research, including preparation, data gathering and analysis, drafting, and approval for publication of this manuscript.

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