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Identification of *Dermatophyta* Fungi in the Armpits of Stroke Patients in Kandeman Subdistrict, Batang Regency

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ABSTRACT

Background & Objective: Skin fungus caused by *Dermatopyta* is called dermatophytosis. The causative fungi are *Tricopyton, Microsporum*, and *Epidermophyton*. *Dermatophyta* is a group of fungi that attach to keratinous tissue, such as the stratum corneum of the skin, nails, and human hair. These fungi can cause damage to living cells by activating the immune system. Stroke patients have difficulty fulfilling their daily needs, such as maintaining personal hygiene, which increases their risk of infection with *Dermatophyta* sp. fungi. This study aims to identify dermatophyte fungi in stroke patients in Kandeman subdistrict, Batang regency. **Method:** This study used a descriptive design with a sample of 17 stroke patients in Kandeman subdistrict, Batang regency. Dermatophyte fungi were examined using a media culture method. **Result:** The examination results showed that all samples were negative for Dermatophyta fungi. The factors supporting these negative results were that most patients still practiced good personal hygiene, such as showering twice a day, ensuring their bodies were completely dry, maintaining excessive dryness, and not experiencing itching on their bodies. This prevented the growth of *Dermatophyta* fungi in the armpits. **Conclusion:** In conclusion, there was no Dermatophyta sp. fungal infection among stroke patients in Kandeman Subdistrict, Batang Regency.

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Introduction

A stroke is an acute local or global brain dysfunction caused by cerebrovascular disease, with signs and symptoms that vary depending on the part of the brain affected. Stroke can occur without warning and can result in complete recovery, disability, or even death due to the cessation of blood flow to the brain caused by

blocked blood vessels in the brain, or bleeding due to ruptured blood vessels in the brain (Wurtiningsih, 2013).

Stroke is the leading cause of disability and death worldwide. According to the WHO in 2022, the number of stroke patients has continued to double, increasing by 50% over the last 17 years. From 1990 to 2019, deaths from stroke increased by 70%, while deaths from stroke increased by 43% (Orgaization, 2022). The number of stroke patients in Indonesia reached a record high of 713,783 in 2018. The province with the highest number of stroke patients in Indonesia is West Java, with 131,846 stroke patients in Bali Province, with 52.35 patients meeting the criteria for regular examinations and 48.54 patients undergoing occasional/irregular examinations. Without further examination, the number is 22.50 (Pokhrel, 2024). Based on the 2018 Basic Health Research (Riskesda), the prevalence of stroke increased in almost all provinces in Indonesia in 2018. The stroke incidence rate in Central Java was 11.8% (Central Java Province Riskesdas 2018 I Report, 2018). Data from the Batang District Health Office shows that in 2023, there were 527 stroke patients, while in 2024, the number of stroke patients decreased to 490. Based on observations at the Kandeman Community Health Center in Batang District, there were 40 stroke patients.

Post-stroke patients usually suffer from different neurological dysfunctions, depending on the area of brain damage suffered (Wurtiningsih, 2013). After a stroke, various functional disorders occur in the form of permanent disabilities and affect various body systems in the form of hemiplegia, which can cause motor dysfunction, namely limited mobility. Mobility disorders cause physical limitations, so stroke patients lose their strength and agility in meeting their basic needs. Stroke patients have difficulty meeting their daily needs and are always dependent on others to meet their daily needs, one of which is personal hygiene. Stroke patients also need others to help them maintain skin hygiene in areas such as folds, such as under the breasts, under the armpits, and in the thigh folds, which makes stroke patients more susceptible to dermatophyte infections (Nabila et al., 2024). Areas that are quite moist also often become breeding grounds for fungi. Indonesia is a tropical country where tropical countries have quite high humidity. With this humidity, fungi can easily spread and infect. The skin is an area that is easily infected by fungi. Fungal infections that cause skin diseases are often found in tropical countries due to the humid air that supports the growth of skin fungi (Arimurti et al., 2022).

Skin fungi caused by dermatophytes are called dermatophytosis. The causative fungi are Tricopyton, Microsporum, and Epidermophyton. Dermatophytes are a group of fungi that attach to keratinized tissues, such as the stratum corneum of the skin, nails, and human hair. These fungi can damage living cells by activating the immune system. Fungal transmission can be direct or indirect. This disease can be transmitted indirectly through plants, clothing, and dust (Anita et al., 2022). Under normal conditions, fungi are present on the human body, but under certain conditions such as hypertension, diabetes, stroke, or heart disease (Syah & Eddy, 2024), their growth increases and causes infection. For example, in stroke patients, infections usually attack the skin in folds, such as under the breasts, under the armpits, and in the thigh folds. In women, itching occurs in the genital area (Dinar, 2024). The presence of fungi on the body can cause effects such as red spots accompanied by itching on the legs, buttocks, stomach, thigh folds, blistering skin, and even discharge (Syah & Eddy, 2024).

Based on research by Putri Carmelita (2022). Regarding the identification of Dermatophyta fungi causing tinea pedis infection between the toes of fishermen in Lebak village, Ketapang subdistrict, out of 32 samples tested, 7 samples were infected with Trichopyton sp, 3 were infected with epidermophyton, and 22 samples were not infected with Dermatophyta (Carmelita & Haris, M, 2022). Further research by Anita et al. (2022) on the morphology of Dermatophyta on the skin and toenails of diabetics in Memajang District, Makassar City, found 2 dermatophyte samples from 15 samples, namely Trichophyton rubrum and Microsporum Gypsum (Anita et al., 2022).

Based on this background, the author was interested in conducting research in the Kandeman subdistrict of Batang Regency on "Identification of Dermatophyta in the armpits of stroke patients in the Kandeman subdistrict of Batang Regency."

The difference between this study and previous studies lies in the subject matter. Previous studies were conducted by Putri Carmelita (2022). The previous study was about the identification of Dermatophyta fungi that cause tinea pedis infection between the toes of fishermen in Lebak Village, Ketapang Subdistrict, and the study by Anita et al. (2022) was about Dermatophyta on the nails and skin between the toes of diabetics in Mamajang Subdistrict, Makassar City, while this study focuses on *Dermatophyte* in the armpits of stroke patients in Kandeman Subdistrict, Batang Regency.

Objective

The purpose of this study was to identify the presence of *Dermatophyta* fungi in the armpits of stroke patients in Kandeman subdistrict, Batang district.

Method

The type of research used is descriptive research. The population in this study are stroke patients in Kandeman District, Batang Regency. Samples were taken using random sampling based on the following criteria:

1) Inclusion criteria
   a) Not undergoing fungal treatment
   b) Willing to be a respondent
2) Exclusion criteria
   a) Respondents who have moved residence.
   b) Respondents changed their minds and did not want to be sampled
   c) Deceased

The research was conducted from September 2024 to June 2025 in Kandman District, Batang Regency. The samples were examined using a media culture method and then observed microscopically and macroscopically. The data in this study came from primary and secondary data. Primary data was obtained through observation, questionnaires, interviews, and the results of Dermatophyta fungus examinations in the laboratory. Meanwhile, secondary data was obtained from relevant references such as research journals and books and from local agencies. The data obtained was then processed, presented descriptively in tables, and narrated. The percentage of stroke patients who tested positive for Dermatophyta fungal infection was obtained from the following formula:

$$\frac{\textbf{\textit{number of positive samples x}}\ \mathbf{100\%}}{\textbf{\textit{total number of samples}}}$$

Results

A study to identify Dermatophyta fungi was conducted on stroke patients in Kandeman District, Batang Regency. The initial sample size was 21 people, but at the time of sampling, two people refused and two others experienced other disorders. The examination was conducted at the Microbiology Laboratory of the Pekalongan Health Analyst Academy from April 21 to May 15, 2025, with the following results:

TABLE 1. Number and presentation of macroscopic and microscopic examination results in the identification of *Dematophyta* fungi in armpit scrapings from stroke patients in Kandeman Subdistrict, Batang Regency

Result	f	%
Positive(+)	0	0
Negative	17	100%
Total	**17**	**100%**

Based on Table 1, the number and percentage of Dermatophyta fungi identified in stroke patients in Kandeman Subdistrict, Batang Regency, all samples were negative.

Discussion

Based on the examination of dermatophyte fungi in 17 samples from stroke patients in Kandeman District, Batang Regency, all samples were found to be negative.

This study is in line with the research conducted by Putri Carmelita on the identification of dermatophyte fungi causing tinea pedis infection between the toes of fishermen in Lebak Village, Ketapang District (Carmelita & Haris, M, 2022). It also aligns with the research conducted by Anita et al. (2022) on dermatophyte fungi in the nails and skin between the toes of diabetic patients in Mamajang District, Makassar City (Anita et al., 2022).

Dermatophyte fungal infections are influenced by several factors, including direct interaction with human skin, which causes dermatophyte infections that are influenced by each individual's immune system. The onset of the disease depends on the characteristics and number of infections and the individual's reaction. Several factors that influence the occurrence of infection include diabetes, peripheral circulation problems, skin maceration, obesity, and poor hygiene. (Ridhwan et al., 2023)

One cause of dermatophyte fungal infection is being in a humid environment, which can lead to fungal infection. In particular, a lack of personal protective equipment can cause the feet and hands to come into direct contact with wet and muddy areas. Personal hygiene is essential for individual comfort, safety, and health. Additionally, tight clothing that does not absorb sweat can also trigger the growth of dermatophyte fungi (Arimurti et al., 2022). These risk factors can be linked to the following research results:

One of the factors causing fungal infections is that damp places can lead to fungal infections. Furthermore, not using protective equipment. In addition, maintaining personal hygiene is very important for individual comfort, safety, and health (Arimurti et al., 2023). From the questionnaire results, it was found that 17 respondents (100%) experienced excessive sweating, causing their bodies to become damp, which can trigger the growth of Dermatophyta fungi.

The questionnaire results related to showering twice a day and ensuring the body is completely dry after showering showed that out of 17 respondents, 15 people

(88%) showered twice a day and 2 people (12%) showered once a day. Infrequent showering habits can cause the skin to become more moist because sweat remains on the body. This condition causes fungi to grow and spread. (Mulyati et al., 2019)

From the questionnaire results, none of the 17 respondents (100%) experienced itching that could cause Dermatophyta fungus on the skin, despite having red spots, prominent rashes, and peeling skin in the armpits. Itching in sweaty areas can cause discomfort, prompting patients to scratch the area, which ultimately causes the lesions to spread, especially in moist areas. (Ermawati, 2013)

Based on the results of the questionnaire on antifungal medication consumption, it was found that all respondents (100%) did not consume antifungal medication at the time of sampling. Systemic antifungals are indicated for patients who do not respond to topical treatment, such as terbinafine, griseofulvin, itraconazole, and fluconazole, which can provide positive results in the treatment of dermatophytosis. However, these antifungal drugs have varying levels of effectiveness as well as different advantages and disadvantages (Warouw et al., 2021).

Experiencing other conditions such as diabetes mellitus can also trigger the growth of Dermatophyta fungi. High blood sugar levels can occur at various ages, including in children. This increase in blood sugar levels can reduce the body's resistance, making it more difficult for the body to fight infection (Fitria et al., 2015). From the questionnaire results, it was found that 2 (12%) of the 17 samples had other diseases, including diabetes mellitus. This study obtained negative results, indicating that Dermatophyta sp. does not only originate from stroke patients but can also be seen from other factors such as climate, habits, environment, mechanical skin damage, fungal impact, low socioeconomic conditions such as crowded housing that can lead to direct skin contact and unhygienic environments, understanding of Dermatophyta disease, and age. (Fatmawati et al., 2023).

Conclusion

Based on the research conducted, it can be concluded that no Dermatophyta fungi were found in stroke patients in Kandeman District, Batang Regency.

It is recommended that future researchers conduct studies to identify Dermatophyta fungi in stroke patients with other factors or in patients other than stroke patients.

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