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Diagnostic Challenge Of Paederus Dermatitis Mimicking Herpes Zoster In The Tropics: A Case Report

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Abstract

The clinical similarity between paederus dermatitis and herpes zoster often poses a diagnostic challenge in tropical regions, frequently leading to inappropriate initial management. This study aims to document a medical case to provide clinical insights into differentiating these two conditions, particularly in settings with limited diagnostic facilities. The method used is qualitative with a case study design to analyze the presentation and management of a patient at the Dermatology and Venereology Outpatient Clinic of Mataram University Hospital. A 14 year old male boarding school student presented with a five day history of sudden, burning erythematous lesions on his back, which had been previously misdiagnosed as herpes zoster by a general practitioner. General physical examination showed normal vital signs and a good general condition. Dermatological examination of the posterior thoracic region revealed well-demarcated erythematous plaques with characteristic elongated linear whip like marks on the left and central back, accompanied by vesicles, erosions, and thin crusts. No laboratory or cytological examinations were performed. Based on the distinctive whip like morphology and an epidemiological history of similar complaints among his dormitory friends, the diagnosis was corrected to Paederus dermatitis. The patient was treated with topical corticosteroid therapy using hydrocortisone 1% cream applied thinly twice daily as the initial treatment. In conclusion, this case highlights that comprehensive environmental history taking and careful assessment of lesion morphology are essential to establish an accurate diagnosis, prevent unnecessary medication use, and ensure appropriate treatment.

Keywords: Paederus Dermatitis, Herpes Zoster, Contact Dermatitis.

INTRODUCTION

Paederus dermatitis is an acute irritant contact dermatitis that is commonly found in tropical countries, including Indonesia (Inbamani et al., 2024; Srihari et al., 2017). Clinical symptoms usually appear within 8-24 hours after exposure (Sularsito & Soebaryo, 2016). The condition is mainly caused by beetles from the genus *Paederus*, especially *Paederus fuscipes* and *Paederus peregrinus*, which are commonly found in humid environments such as rice fields, plantations, and riverbanks. Several outbreaks have been reported to increase after the rainy season (Jiamton et al., 2022; Uzunoğlu et al., 2016).

Unlike other insects, *Paederus* beetles do not bite or sting humans. Skin lesions occur when the insect is accidentally crushed on the skin, releasing a toxin-containing body fluid called pederin. This toxin is produced by female beetles through a symbiotic relationship with *Pseudomonas* species. Contact with pederin can cause severe irritation and damage to epidermal cells, leading to the sudden appearance of erythematous plaques, vesicles, bullae, and a burning sensation that may progress into painful necrotic blisters (Tamilselvan et al., 2024).

The clinical presentation of Paederus dermatitis often resembles other skin diseases, making the diagnosis challenging during the initial examination. One of the most common differential diagnoses is Herpes zoster because both conditions can present with rapidly

developing vesicular lesions accompanied by pain and burning sensations. The similarity in lesion morphology and subjective symptoms may lead to misdiagnosis, especially in settings with limited diagnostic facilities (Jiamton et al., 2022; Ankad et al., 2022).

In daily clinical practice, access to supporting examinations such as histopathology and dermoscopy is still limited, which contributes to the high rate of diagnostic errors. This case report presents a case of Paederus dermatitis that was initially diagnosed as Herpes zoster. This report is expected to provide additional insight into the clinical differentiation of both conditions and help reduce inappropriate management in clinical practice.

RESEARCH METHODS

This article used a qualitative method with a case report design to analyze the diagnostic challenges in a patient with Paederus dermatitis at Mataram University Hospital.

RESULTS AND DISCUSSION

Case Presentation

A 14 year old male patient presented to the Dermatology and Venereology Outpatient Clinic of Mataram University Hospital with complaints of reddish lesions on the back accompanied by a burning sensation. The symptoms had been present for five days before presentation. The lesions appeared suddenly, and the burning pain became more noticeable when the affected area was touched or exposed to water. At the time of examination, the patient stated that the symptoms were still persistent.

The patient had previously visited a general practitioner and was prescribed oral Vitamin B complex and Vitamin C. He also performed self medication by applying over the counter topical antibiotics, but the symptoms did not improve. The patient denied any previous medical history or family history of similar disease. Based on the social and epidemiological history, the patient was a boarding school student living in a collective dormitory setting. The patient also reported that several friends in the boarding school experienced similar complaints during the same period.

Physical examination revealed a patient in good general condition with compos mentis consciousness. Vital signs, including blood pressure, pulse rate, respiratory rate, and body temperature, were all within normal limits. General physical examination of the head and neck, thorax, abdomen, and upper and lower extremities showed no abnormalities. Dermatological examination of the posterior thoracic region revealed well demarcated erythematous plaques with elongated linear lesions dekaresembling whip like marks on the left and central back regions. Vesicles were observed on the erythematous base, along with several areas showing erosion and thin crusts due to ruptured vesicles. No laboratory or cytological examinations were performed in this patient. Based on the integration of history taking, physical examination, and the patient's environmental epidemiological characteristics, the patient was diagnosed with Acute Irritant Contact Dermatitis caused by pederin toxin or Paederus dermatitis. The patient was treated with topical corticosteroid therapy using clobetasol propionate 0.05%. The medication was applied thinly and evenly to the affected areas of the skin lesions and inflammation.

Discussion

Contact dermatitis is an inflammatory skin condition caused by exposure to external substances. Based on its mechanism, contact dermatitis is classified into allergic contact dermatitis, which involves an immunologic reaction and irritant contact dermatitis, which occurs due to chemical or physical agents (Sularsito & Soebaryo, 2016). Paederus dermatitis is a form of delayed acute irritant contact dermatitis caused by exposure to paederin toxin

from insects of the genus *Paederus* in the family *Staphylinidae* (Sularsito & Soebaryo, 2016; Uzunoğlu et al., 2016). In Indonesia, these insects are commonly known as "tomcats," with *Paederus peregrinus* being the species most frequently associated with dermatitis cases (Uzunoğlu et al., 2016).

The warm and humid tropical climate of Indonesia supports the life cycle and population growth of *Paederus* insects (Gao et al., 2024). Agricultural activities such as rice harvesting and plowing may disrupt the natural habitat of these insects, triggering their mass migration into residential areas (Palaniappan & Karthikeyan, 2023). Their phototactic behavior causes *Paederus* beetles to be attracted to artificial light and enter houses more frequently at night (Maryam et al., 2017). This condition increases the risk of exposure in collective living environments such as dormitories and boarding schools, especially those located near vegetated areas (Neamin et al., 2021; Datta et al., 2025). High residential density and limited public awareness regarding the dangers of these insects also contribute to the increased incidence of clustered cases in boarding school environments.

Clinical manifestations usually appear 8–24 hours after contact in the form of polymorphic lesions such as erythema, vesicles, or pustules, that commonly affect exposed areas of the body (Srihari, et al., 2017). These variable clinical presentations may resemble several other dermatologic conditions, including herpes zoster, thereby creating diagnostic challenges, particularly in endemic regions (Nair & Patel, 2023; Tamilselvan et al., 2024).

Paederus dermatitis and herpes zoster often present a diagnostic challenge because both conditions can show similar clinical manifestations, especially during the early stage of the disease. In both conditions, patients may complain of pain, itching, soreness, heat, or a burning sensation on the skin. Another similarity can be seen in the morphology of the lesions, which appear as erythematous lesions accompanied by vesicles in a linear or elongated pattern. The linear lesions in Paederus dermatitis may resemble the segmental distribution of herpes zoster, thereby increasing the risk of misdiagnosis (Tamilselvan et al., 2024; Nair & Patel, 2023).

Paederus dermatitis is an acute skin inflammation caused by the cytotoxic and non-infectious inflammatory effects of pederin toxin. This toxin inhibits protein and DNA synthesis through disruption of ribosomal function in eukaryotic cells, leading to apoptosis and necrosis of epidermal keratinocytes. Keratinocyte damage triggers acantholysis and the formation of superficial vesicles and pustules, which are characteristic features of Paederus dermatitis. The inflammatory process is further enhanced by the release of proinflammatory mediators such as IL-1β and TNF-α, resulting in vasodilation, increased vascular permeability, and inflammatory cell infiltration that clinically manifest as erythema, edema, burning sensation, and pain of the skin (Srivastav Yash et al., 2025). In contrast, herpes zoster occurs due to latent reactivation of Varicella zoster virus (VZV) in the sensory ganglia during conditions of decreased immunity. The virus subsequently spreads along sensory nerve fibers to the skin according to the dermatomal distribution (Gadade et al., 2025).

There are several characteristic features that can help differentiate Paederus dermatitis from herpes zoster. Herpes zoster is generally preceded by prodromal neuropathic pain with a unilateral dermatomal distribution of lesions, whereas Paederus dermatitis appears without a prodromal phase after contact with Paederus insects (Dellatorre & Haddad Jr. 2024). Dermoscopy may also be used as a diagnostic aid. In Paederus dermatitis, dermoscopy typically shows yellowish-white structures on an erythematous background accompanied by brown patches, whereas herpes zoster more commonly demonstrates grayish-brown globules with a characteristic vesicular pattern (Ankad et al., 2022).

The management of Paederus dermatitis aims to reduce inflammation, relieve subjective symptoms, and prevent secondary infection. Topical corticosteroids are the main therapy as they are effective in suppressing the acute inflammatory response (Litchman et

al., 2023). The choice of treatment is adjusted according to the severity and extent of the lesions, such as hydrocortisone 2.5%, fluocinolone acetonide 0.025%, or clobetasol propionate 0.05% for more severe cases (Gunawan D. Yudhi et al., 2022; Litchman et al., 2023). Normal saline (NaCl 0.9%) compresses may be applied to exudative lesions. Oral antihistamines can be used to reduce pruritus and discomfort. Oral corticosteroids and antibiotics may be considered in severe cases or when there is evidence of secondary bacterial infection (PERDOSKI, 2024). The supportive management of Paederus dermatitis includes cleaning the affected skin area, cold compresses. Its clinical similarity to herpes zoster often leads to the administration of unnecessary antiviral therapy (Moore & Blundell, 2017). This condition may increase excessive medication use without clear therapeutic benefit, while also increasing the risk of side effects and drug interactions (Moore & Blundell, 2017; Zaouak et al., 2024). An accurate diagnosis is important to ensure appropriate treatment, prevent unnecessary medication use, and minimize complications through education on preventing Paederus exposure (Moore & Blundell, 2017; Daruish et al., 2024; Dellatorre & Haddad, 2024; Zaouak et al., 2024).

CONCLUSION

Paederus dermatitis is one of the skin diseases commonly found in tropical regions that can act as a great mimicker of herpes zoster due to their similar clinical manifestations. Erythematous lesions accompanied by vesicles with pain or burning sensation often lead to misdiagnosis and inappropriate treatment. This case report highlights the importance of careful history taking related to environmental exposure and thorough local physical examination to identify the characteristic features of the lesions. Increased clinical awareness is important to establish an accurate diagnosis, prevent unnecessary medication use, and ensure appropriate treatment.

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