

CASE STUDY: THE CORRELATION BETWEEN BEETLE PEDERIN AND PAEDERUS DERMATITIS WITH TINEA INFECTION**Shakthivel C.D.*, Muthu Prasath M.K., Thanujasree S., Easuar J.L., Keerthivasan S.S. and Gokulavasa N.**

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ABSTRACT

A 15-year-old female admitted with the complaints of redness, itching, burning sensation and kissing pattern of lesions on left hand elbow in the past 20 days and a circular rash for 5 days after intake of fish. Initially, it appeared as a rash. Erythematous papules were formed initially which were peculiar and irritating that passed through various stages to form an erythematous plaque with many vesicles that decayed to form sterile pustules. Intake of sea food resulted in worsening the rash and eventually turned into invasive tinea infection. The patient was evaluated by two local doctors but was not diagnosed. Finally, it was determined that the Nairobi fly's deadly hemolymph, pederin, was to blame (Paederus). The rash mainly affects body portions that aren't covered by clothing; recovery takes 7 to 28 days, and skin darkening is common. anti- vector precautions, such as bed nets, long-sleeve clothes, and avoiding fluorescent lights, are among the preventive measures. If beetles are found on the skin, brush them off instead of crushing them to prevent dermatitis. Antibiotics, steroids, and antihistamines may be used in addition to promptly cleaning the infected region and applying cold, moist compresses.

KEYWORDS: Nairobi Fly, Pederin, Paederus.**INTRODUCTION**

Paederus dermatitis (also known as spider lick and dermatitis linearis) is a rare, blistering irritating contact dermatitis characterized by erythematous bullous lesions that appear suddenly on exposed body parts.^[1] An insect belonging to the genus Paederus is responsible for the sickness. Due to low penetration, this chemical does not normally impact the palms of hands or the soles of feet.^[2] This beetle does not bite or sting, but it does discharge coelomic fluid, which includes pederin, a strong vesicant agent, when accidentally brushed against or crushed against the skin. Within 24-36 hours, this chemical causes acute dermatitis, which can be asymptomatic or accompanied by a slight itching burning sensation. Patients may be unaware that they were gardening or staying outside during the day before the beginning of dermatitis because contact with the beetle is painless.^[3] This instance of Paederus dermatitis with tinea infection caused by seafood consumption is described in this article. Tinea Illness is a skin or scalp fungal infection that is very infectious. Skin-to-skin contact or contact with an infected animal or object spreads ringworm.

CASE PRESENTATION

A 15-year-old female patient from South India who presented with redness, swelling, itching, and burning sensation with kissing pattern of lesions on the left-hand

elbow for 20 days. The patient reported a history of acid fly bites and paederus dermatitis and had been taking Tab. Levocetirizine 5mg OD PO for her symptoms. She denied any insect interactions in the 48 hours prior to the onset of her symptoms and resided in an area with fluorescent lighting.

The patient's symptoms began with the appearance of a reddish rash (erythema) which developed into blisters. The irritation, including crusting and scaling, persisted for two to three weeks. The kissing lesions of paederus dermatitis occurred due to the transfer of the irritant from one area to the surrounding areas of skin.

Upon physical examination, the patient's vital signs were normal, but dermatological findings of the left hand were abnormal. Laboratory examination revealed an elevated ESR rate, indicating the presence of infection.

This case highlights the importance of early diagnosis and appropriate treatment of paederus dermatitis to avoid complications and prevent long-term effects. It also emphasizes the need for preventive measures such as wearing protective clothing and avoiding exposure to fluorescent lights. Further research is needed to improve the understanding, diagnosis, treatment, and prevention strategies for this rare condition.

During the physical examination, the patient presented with erythematous patches in kissing pattern of lesions on the left-hand elbow, which appeared like a rash (Figure 1). Initially, it caused only mild discomfort within 24 hours, but within 2-3 days, the affected area turned grey, resembling a burn, and was diagnosed as paederus dermatitis or acid fly bite. The hand showed multiple scattered vesicles with an erythematous base (Figure 2). After 48 hours, the pain increased significantly, and the largest lesion appeared after the intake of fish, leading to the diagnosis of tinea infection. The left arm exhibited lesions that appeared as a mildly tender plaque with erythematous borders, which were fluctuant and warm to touch. Upon closer examination, small, scantily visible vesicles were also observed. The patient's vital signs were normal, and no lymphadenopathy was detected.

The patient had a clean medical history with no chronic illnesses. The patient's social history indicated a normal bowel and bladder routine, mixed dietary preferences, and normal sleep and appetite patterns. Two local physicians examined the patient and advised against washing or covering the lesions, and did not mention the risk of contagion through touch. Pharmacists recommended using lemon juice, steroid cream, or triple antibiotic ointment to alleviate symptoms. Despite these treatments, the patient's dermatitis worsened into an invasive tinea infection after a week due to seafood

intake (Figure 3). The patient was diagnosed with "Paederus dermatitis associated invasive tinea infection" after a thorough investigation into possible sources of symptoms. Tinea infection is a highly transmissible fungal infection that affects the skin, nails, and hair.^[6] A characteristic symptom is a circular rash with scaly edges and a less infected center, which is common in childhood.^[7] The infection can be contracted by touching an infected individual, moist surfaces such as shower floors, or even from pets. In this case, the patient acquired the infection through seafood ingestion. Accurate results can be obtained through biopsy and skin culture.

The treatment of choice for paederus dermatitis associated invasive tinea infection is anti-fungal medication. For mild cases, topical terbinafine for four weeks is recommended. However, for severe cases, the decision is less clear and both itraconazole (100-200 mg/day for 2-4 weeks) and terbinafine (250-500 mg/day for 2-6 weeks) have been shown to be effective. Following the start of medication, the vesicles started to shrink and the patient experienced relief from pain after 48 hours. The patient's dermatologist diagnosed the condition as Nairobi fly rash and informed the patient that the lesions would dry up and peel off after 8 days. However, scarring and discoloration similar to a scar may remain after the lesions heal, similar to that seen with a healed burn.



Figure 1: Starting stage of paederus by appearing like a rash (few erythematous patches in kissing pattern of lesions)

The recommended treatment plan for the patient includes the use of Tab. Itraconazole, which is an antifungal drug. The prescribed dose is 200 mg to be taken orally once a day at night after food for a period of 2 weeks. It is important for the patient to take necessary precautions, such as consuming sufficient food and fluids to avoid adverse effects like numbness, muscle pain, mood

changes, and decreased urine output. Additionally, the patient is advised to take Tab. LIMCEE, which is a vitamin supplement drug that should be taken orally once a day after food. Possible adverse effects include heartburns, nausea, vomiting, stomach cramps, and mild headache.

Furthermore, the patient is also advised to use Ointment T Bact, which is a topical antibiotic drug. The recommended dose is 5g to be applied topically twice a day, in the morning and night after bath, using a cotton swab. Adverse effects may include tenderness, dry skin, swelling, generalized scales, and rash on the skin.

It is worth noting that there are no other interventions necessary in this case. The infection progressed due to the patient's lack of awareness and failure to avoid consuming seafood. It is essential to educate patients about the risks associated with their dietary habits and ensure that they take appropriate precautions to prevent the recurrence of such infections.

Recommended lifestyle modifications for managing the

condition include proper hygiene practices, such as cleaning the infected area with warm water and applying cold compresses to relieve itching. Avoiding non-vegetarian foods, particularly fish, is crucial to prevent the exacerbation of the infection. Using a new towel and washcloth for each use and cleaning sinks, bathtubs, and bathroom floors after each use are necessary measures to prevent the spread of infection. Clothes should not be shared to avoid transmission. For individuals with fish allergy, complete avoidance of fish is essential to manage the condition effectively. Additionally, it is important to note that some individuals may be allergic to fish gelatin, which also requires avoidance. Overall, it is recommended to prioritize one's health and well-being by taking necessary precautions to prevent the recurrence of infection or allergic reactions.



Figure 2: Paederus Dermatitis or acid fly bite (Erythematous patches with multiple vesicles on patient left hand).



Figure 3: Infection turned into invasive tinea infection after intake of fish (Multiple scattered vesicles with erythematous bases).

DISCUSSION

Paederus dermatitis is caused by the presence of pederin in the hemolymph of *Paederus* beetles. The release of pederin is not a defensive mechanism by the beetle, but instead occurs when the beetle is accidentally crushed against the skin. This exposure to pederin causes an intense rash, with most individuals presenting with linear lesions resulting from inadvertently brushing off the beetle from their skin. However, excessive scratching can result in larger, necrotic-appearing areas in some cases.^[1] Figure 4 shows the *Paederus* beetle responsible for causing the dermatitis.



Figure 4: Typical russet-colored *Paederus* beetle.

Paederus beetles can cause irritation and blistering when crushed against the skin or eye due to their bite and sting. The clinical differential diagnosis of *paederus dermatitis* includes acute allergic or irritating contact dermatitis, heat burns, and phytophotodermatitis. To prevent primary injuries or sores, patients should be advised not to crush beetles on their skin or wipe their eyes after significant involvement. Providing instructions on general well-being can aid in the early detection of *paederus dermatitis* and prevent complications. Artificial light sources attract these beetles, and the majority of patients in our study used fluorescent lighting at home, which attracted the beetles to their surfaces. When removing the beetle from the skin, it is recommended to gently blow or brush it to avoid pederin exposure. To minimize the risk of harm, individuals who suspect exposure should promptly wash the affected sites, along with any exposed clothing or linens, with soap and water to remove the toxin.

CONCLUSION

Paederus dermatitis is a prevalent skin condition caused by exposure to the toxin pederin, which is present in the hemolymph of certain species of rove beetles, including *Paederus* spp. While the condition is not life-threatening, it can cause discomfort and itching, and in severe cases, blistering and secondary infections. Prevention is key to avoiding *Paederus dermatitis*. It is recommended to wash all towels in warm soapy water and dry them thoroughly, or invest in new towels and washcloths for each use. Additionally, it is important to clean sinks, bathtubs, and bathroom floors thoroughly after each use to eliminate any potential contact with the beetle toxin.

Clothes should not be shared to avoid the spread of the toxin. Public awareness of *Paederus dermatitis* is

essential in reducing the incidence of this illness. By educating individuals on the causes, symptoms, and prevention methods, people can better protect themselves from exposure to the toxin. Further research is needed to determine the most effective strategies for raising public awareness of this condition, as well as developing treatments for those who do experience symptoms.

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