

**Case report:**

**Paederus Dermatitis: A severe reaction to Charlie's kiss**

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**Abstract:**

Paederus dermatitis is a very painful vesicular condition which is caused by the extremely potent toxin "Pederin" released from an insect called Paederus fuscipes but commonly known as Charlie. A 26 years old woman presented with a sudden onset of neuralgia, arthralgia of left jaw, fever, nausea and fatigue with generalized pain radiating to the neck and lower jaw as well as itch-like sensation on their left arm associated with acute inflammation which began 24-48 hours prior. The patient refused to go to the hospital due to the current pandemic situation but instead updated us daily on her conditions with photographic changes of the arm until complete resolution of symptoms. This case report accounts for the daily sequential changes experienced by a patient after severe reaction to an exposure of pederin with photographs of the affected site. While the painful lesion and all systemic conditions resolved spontaneously over time, a scar was left to mark the unpleasant period.

**Keywords:** Paederus dermatitis; Pederin, Toxin; Paederus fuscipes

Bangladesh Journal of Medical Science Vol. 20 No. 02 April'21. Page : 459-462  
DOI: <https://doi.org/10.3329/bjms.v20i2.51566>

**Introduction**

Paederus dermatitis; a painful vesicular lesion is caused by the most powerful toxin, 'Pederin' within the animal kingdom<sup>1,2</sup>. The toxin is said to be 15 times stronger than cobra venom and yet is released from an insect (*Paederus fuscipes*, locally known as *Charlie*) roughly 7-10 mm in size (**Figure 1**)<sup>3,4</sup>. The Highly potent toxin can completely inhibit cell growth at very small (15 ng/mm) concentrations.<sup>5</sup> This toxin is however only released when the insect makes contact with skin tissue and result in severely painful blisters on the skin it makes contact on.<sup>2</sup> Because of the benign nature of Paederus Dermatitis, 43% of

affected patients are not indicated any formal clinical management<sup>5</sup> and therefore do not receive much consideration during diagnosis.

**Case report**

A 26-year-old female dental student recently diagnosed to be free of all infectious and transmissible diseases complained of burning neuralgia and arthralgia of left arm and neck region. It began 24-48 hours prior with 100F fever, nausea, fatigue, and an itching sensation on the left forearm. The patient had no existing cardiac, neurogenic, or endocrine disorders. Upon examination, the student demonstrated 100F fever and an erythematous lesion on the left arm. Blood

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**Figure 1:** The Paederus fuscipes (Charlie beetle)



**Figure 2:** Week 1 of paederus dermatitis manifestation

pressure and pulse findings were unremarkable. Intraoral examination yielded unremarkable findings. The student adamantly refused a referral to the hospital out-patient department for their condition fearing exposure to coronavirus affected patients. Paederus dermatitis was suspected and therefore no treatment was administered. **Figure 2** demonstrates

the skin changes during the first week of monitoring while **Figure 3** shows the second week and outcome after 6 months.

### Discussion

Paederus species are dispersed throughout tropical rainy climates<sup>1,2</sup> of South Asia, Africa, and South

America<sup>3,4,6</sup>. However, Paederus can only generate the toxin when a particular set of conditions are met and therefore endemic regions only experience periodic outbreaks of the dermatitis.<sup>1,7</sup>

Pederin is produced by gram-negative pseudomonas bacteria<sup>1</sup> which trigger apoptotic effects on the layers of the dermis, thereby disrupting DNA and protein synthesis<sup>1,5,8</sup>. The lesion progresses through different phases which are clinically graded from mild to severe. After contraction of the toxin, there will be slight erythema (Erythematous phase; 24-48 hours) which may resolve spontaneously. Moderate cases are characterized by marked erythema and gradually enlarging blistering pruritis (Vesicular phase; 48-94 hours) progressing to dermal sloughing (Squamous phase; 7-10 days) and hyper pigmented skin with/without scarring that persist for months.<sup>(2)(3)(6)9</sup>When

moderate cases involve extensive skin tissue (kissing lesion), there are additional symptoms like fever, neuralgia, arthralgia and vomiting and is classified as severe.<sup>8</sup> Varying thickness of skin layers amongst patients and the site on which the toxin is in contact affect the amount of scarring<sup>2,3,6,9</sup>. Toxin exposure in the face and genital regions (highly vascular regions) exhibit aggravated responses and larger blisters with risks of conjunctivitis, oral blisters and space infections.<sup>2,3</sup>

Management protocols, if needed, include thorough rinsing with soap water, cold compresses, and topical corticosteroids for skin exposure. Fever, headache and nausea require symptomatic relief by NSAIDs but are largely dependent on patient tolerance.<sup>1,2</sup> Exposure to sensitive regions indicate a prescription of topical analgesic lotion<sup>1</sup> For eye infection;



**Figure 3:** Week 2- and 6-months follow-up of paederus dermatitis manifestation

artificial methylcellulose drops, Homatropine and Ciprofloxacin/Dexamethasone can be used to control the lesion. Prophylactic antibiotics are prescribed for patients who demonstrate risks of the secondary infections because of excessive itching.<sup>1,2</sup>Intraoral exposures can benefit from oral corticosteroid gels, anesthetic ointments and antibacterial mouth rinses. However, an official oral protocol is still lacking and therefore should be the subject of future exploration.

### **Conclusion**

It is necessary to identify the symptoms appropriately for Paederus Dermatitis as in most cases, treatment is not necessary for complete resolution.

**Source of fund:** None

**Ethical clearance:** Not applicable

**Conflict of Interest:** None

**Author's contribution:**

Intellectual content and design: FR, SH, THF

Conception, analysis interpretation and drafting of manuscript: THF, SH, FR, AB

Conception, design: THF, SH, FR

Provision of patient: FR, NBJ

Technical and logistic support: FR, AB

Critical revision and final approval of article: NBJ, MKA

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