Paederus Dermatitis: A Case Series

Abstract

Vorderman (1901) was the first to record blisters caused by beetles in medical literature. Blister beetle dermatitis is a cutaneous condition caused by the toxins released by blister beetles. The vesicant chemical in the body fluids of these insects causes an acute irritant contact dermatitis characterized by erythematovesicular lesions associated with burning sensation on exposed parts of the body. The aim of this study was to investigate the morphological patterns of blister beetle dermatitis. We conducted a 1-year (January–December 2014) prospective study of the clinical presentation of Paederus dermatitis noticed in urban and semirural areas close to paddy fields in the Cauvery Basin, Mysuru, Karnataka. All patients with Paederus dermatitis attending the outpatient department of Department of Dermatology were recruited in the study with a total of 37 patients. Diagnosis was made on detailed history regarding onset of lesions, symptoms, as well as thorough clinical examination of the lesions. The peak time of presentation was June–September, the monsoon season in this part of India. The average duration of lesions at the time of presentation was 2–5 days. All patients had a history of burning and itchy sensation at night followed by full blown lesions the next morning, with the face, neck, and arms being the most common sites. Patients were predominantly males with the age range of 13–55 years. The most common presentations were linear erythematous plaques and erythematovesicles with a “burnt” appearance and a gray necrotic centre. “Kissing” lesions and periorbital involvement were seen in 5 and 6 patients, respectively. Species identification of the Paederus beetles was not done. Paederus dermatitis occurs in tropical regions. Awareness about the morphological patterns of the condition will prevent misdiagnosis. Simple preventive measures can be undertaken based on the behavioral pattern of this nocturnal beetle.

Keywords: Blister beetle dermatitis, irritant contact dermatitis, Paederus dermatitis

Introduction

The fact that beetles cause blisters on the skin has been known since the days of Archigenes, a contemporary of Celsus as recorded by Castellani and Chalmers (1919). It was also noted that researchers differed regarding the origin of the blistering fluid, some supposing that it came from the mouth and others from the feet. Kennedy in 1949 recorded that approximately 652,000 kinds of insects have been described, and that there are probably between two and four million different species. According to Patton (1929), there are approximately 250 known species of Paederus beetles. Most of these beetles contain vesicant fluid. The beetles look alike with slight differences in color, shape, and structure of the head and thorax, which can be ascertained under suitable magnification. Paederus Brasiliensis commonly known as Podo, P. Colombius, P. Fusipes, and P. Peregrinus cause Paederus dermatitis (PD) in South America, Venezuela, Taiwan, and Indonesia, respectively. Approximately 43 species of Paederus beetles were recorded in the Indian peninsula by Cameron in 1931. Neon and fluorescent light sources attract beetles. PD is known to be an entomological model of irritant contact dermatitis. In India, P. melampus is the species commonly causing PD. The vesicant chemical in the body fluids of these insects causes an acute irritant contact dermatitis characterized by erythematovesicular lesions associated with burning sensation on exposed parts of the body.

Case Report

We present here a consecutive clinical series of 37 cases of blister beetle dermatitis (BBD), 24 male patients and 13 female patients, noticed in urban and semirural areas within a few kilometres from paddy and sugarcane fields around the Cauvery river basin, Mysuru, Karnataka, south India. Most of the patients were residents from urban and semirural areas.

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around the Cauvery river basin [Table 1]. Out of the
37 patients, 9 were from rural areas living in kutcha houses,
11 from urban areas, and 17 were from semiurban areas
residing in pucca houses. The peak time of presentation
was during June–September, which is the monsoon season
in this part of the country. All patients presenting with a
short history of itchy lesions with a burning sensation over
exposed parts of the body with typical morphology of
lesions were included in the study. The average duration of
lesions at the time of presentation was 2–5 days. Though
none of the patients could remember their encounter
with beetles, all gave a history of having a burning itchy
sensation at night at the site of the lesion and observing full
blown lesions the next morning. The face, neck, and arms
were the most common sites of involvement. Male patients
outnumbered female patients in our case series. The age
of the patients was in the range of 13–55 years. Clinically,
the most common presentation was linear, erythematous
plaques and erythematovésicles with a “burnt” appearance
and a gray necrotic centre [Figure 1a]. Lesions healed
with hyperpigmentation [Figure 1b]. Other morphological
presentations noted were bullae [Figure 2a], classical
[Figure 2b] and periorbital [Figure 2c and d]. Few of the
patients had lesions spreading to the adjacent areas of
skin. “Kissing” lesions [Figure 1a] were seen in 5 patients.
Six patients had periorbital involvement. Other variants
observed were bullae, pustules, annular lesions, papules,
and erosions. Cases were treated with topical antibiotics
and symptomatic treatment with antihistamines. Preventive
measures such as avoiding resting in open areas close to
paddy fields and neon lamps during night time was advised.
Histopathological investigation was not done as the lesions
were of typical morphology with a typical history. Many
patients did not give consent to procedure as lesions were
in the head and neck area. None of the patients had any
systemic findings. Ethical committee approval and consent
from patients was taken for the study.

Discussion

Beetles cause papulovesicular dermatitis resulting from an
allergic reaction. PD is endemic in regions where paddy
and sugarcane are the main agricultural products. Beetles
are also attracted to neon lights. Outbreaks of dermatitis
in various countries such as Australia, Malaysia, Sri Lanka,
Nigeria, Kenya, Central Africa, Uganda, Okinawa, Sierra
Leone, Argentina, Brazil, France, Venezuela, Ecuador,
and India have been found to be associated with Paederus
beetles. PD is commonly caused by *P. melampus* in India.[3]
In India, PD has been reported from Odisha, West Bengal,
Punjab, Rajasthan, and Tamil Nadu. BBD, characterized
by erythematous, vesiculobullous eruptions, occurs after
contact with the vesicant chemical contained in the body
fluids of the three major families of beetles of the order
Coleoptera [Figure 3] – Meloluidae, Oedemeridae, and
Staphylinidae. Cantharidin is the vesicant chemical in
both Oedemeridae and Meloluidae, however, in the third
family (including the genus *Paederus*) the vesicant is
Pederin which causes PD. Cantharidin was found in an
average of 3.89 µg/beetle in males and 21.68 µg/beetle
in females, which are amounts sufficient to irritate human
skin.[6] Non-inflammatory vesicles and bullae are seen in

![Figure 1: (a) Kissing lesions in Paederus dermatitis. (b) Post-healing
sequel – hyperpigmentation in Paederus dermatitis](image)

| Age Range (In Years) | Sex | Area of Residence | Site | Morphology | Lesions |
|---------------------|-----|-------------------|------|------------|---------|
|                     | M   | F                 | U    | SU         | R       | UL | LL | PO | HN | O | K | L | C | A | B | EV | P | RE |
| <10                 | 1   | -                 | 1    | -          | -       | -  | -  | -  | -  | - | - | 1 | - | - | - | - | - | - |
| 11-20               | 5   | 3                 | 1    | 5          | 2       | 2  | 1  | 1  | 3  | 1 | 1 | 2 | 6 | - | - | 1 | - | 1 |
| 21-30               | 9   | 3                 | 4    | 3          | 5       | 2  | 2  | 6  | 1  | 1 | 1 | 2 | 8 | 2 | - | - | 1 | 1 |
| 31-40               | 3   | 6                 | 2    | 5          | 2       | 2  | -  | 1  | 4  | 2 | - | 1 | 6 | 1 | 1 | - | 1 | - |
| 41-50               | 3   | 1                 | 2    | 2          | -       | -  | 1  | 3  | -  | - | - | 4 | - | - | - | - | - | - |
| >50                 | 3   | -                 | 1    | 2          | -       | 1  | -  | 1  | 1  | - | 1 | - | - | 2 | - | - | 1 | - | - |

M: Male, F: Female, U: Urban, SU: Semi urban, R: Rural, UL: Upper limb, LL: Lower limb, PO: Peri Orbital other than Head and Neck, HN: Head and Neck, O: Others, K: Kissing, L: Linear, C: Classic, A: Annular, B: Bullae, EV: Erythematovésicular, P: Papule, RE: Resolving, Classic: Erythematous plaque with a grey necrotic centre, Kissing: Apposition of damaged areas to previously intact skin
cantharidin dermatitis. PD is characterized by vesicles and pustules arising on an intensely inflamed skin. Bullae can be formed in some cases. Acute dermatitis appears 12–36 hours later corresponding to the shape and dimension to the area over which the vesicant chemical was released. Pathogenesis of classic lesions was intraepidermal neutrophils combined with areas of confluent necrosis and reticular degeneration and that of classic lesions with vesicles or pustules was neutrophilic spongiosis leading to vesiculation and eventual reticular degeneration of the epidermis. Atypical variants of PD have several possible causes:

(a) Contact with different species of Paederus; (b) Repeated contact in short period of time; (c) Existence of underlying disorders, e.g., atopic dermatitis; (d) Use of heavily infested sources of water for bathing; (e) Immunologic phenomenon resulting in systematized reaction pattern.

Clinically, PD mimics a host of other dermatoses, e.g., herpes zoster, phytophotodermatitis, impetigo, etc. Systemic associations with this condition are very few. Four cases of hospitalization for extensive ulcerations and exfoliative dermatitis have been included in the reports of Todd et al. Vasculitis-like eruptions, cervical lymphadenopathy, and nodular interstitial infiltration of the lungs have been reported. Erythema multiforme after contact with beetles has also been reported. Several authors have opined that an important factor in outbreaks of BBD is proximity to paddy fields. However, majority of our patients came from urban and semiurban localities, they were just a few kilometres away from paddy and sugarcane fields. Limitation of the study is that species identification of Paederus beetles was not done.

Conclusion

PD occurs in tropical regions. Awareness about the morphological patterns of the condition and its clinical features will prevent misdiagnosis. Simple preventive measures can be undertaken based on the behavioral pattern of this nocturnal beetle.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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