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Brief Communication

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Paederus dermatitis in a seafarer diagnosed via telemedicine collaboration

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Abstract

Seafarers are traveling workers, subject to unique exposures and generally isolated from adequate medical care. This case report of paederus dermatitis diagnosed at sea highlights the importance of a multidisciplinary diagnostic approach and telecommunication in providing remote medical advice to isolated traveling workers such as seafarers.

Key words: Seafarer, telemedicine, dermatitis, occupational exposure, occupational illness, paederus

Introduction

Traveling workers are at risk of travel-related illness related to their work assignments. Merchant seafarers, who travel around the world as required by their job, are an isolated working population without access to usual medical care. Telemedicine is increasingly utilized in this important working population, providing unique challenges and opportunities in medical diagnosis and treatment. This case report demonstrates how telemedicine and interdisciplinary collaboration can be utilized appropriately in managing traveling workers with challenging clinical findings and unusual travel-related health hazards.

Case Report

A 37-year-old Filipino seafarer requested remote medical advice for an itchy, red 'insect bite'. He reported initial symptoms within 2 days of returning to the ship, after spending time ashore at a Nigerian port. Photographs of the affected area were forwarded for physician advice. Images were notable for erythema and minor vesicular lesions, leading to a diagnosis of infection secondary to an insect bite (perhaps due to excoriation). Of the available medications onboard, oral doxycycline was advised, with instructions to monitor symptoms and provide new images over ensuing days.

Two days later, the seafarer reported worsening of the rash. The images of the rash were notable for increased vesicular lesions on an erythematous base (Figure 1). Lack of response to antibiotics prompted reconsideration of the initial diagnosis of impetigo, expanding the differential diagnosis to include endemic arthropod-borne conditions. A description of the insect was requested. The seafarer had saved the unusual specimen after he had originally removed it from his skin, and so photographs of the insect were forwarded from the ship by email (Figure 2). Unable to identify the unfamiliar insect, the physician then asked for assistance from The Connecticut Agricultural Experiment Station, which has expertise in arthropod taxonomy. The insect was positively identified as a member of *Paederus* genus in the family Staphylinidae, commonly known as 'rove beetles'. Based on this information and subsequent review of the literature, a diagnosis of paederus dermatitis was made. The seafarer was advised to apply topical steroids and take oral antihistamines for pruritus on an as-needed basis. The lesions improved over several days, with resolution of lesions and post-inflammatory hyperpigmentation noted 2 weeks later on follow-up images.

Discussion

The genus *Paederus* includes at least 622 described species worldwide. Species in this genus thrive in warm wet environments[1] and are common in tropical regions of the world. They are usually 1 cm in length with alternate black and orange/red banding. The head is black, elytra (wing covers) orange/red, progressing to black, orange/red, then black banding of the abdomen (Figure 2). Elytra can be iridescent blue/green. Unlike

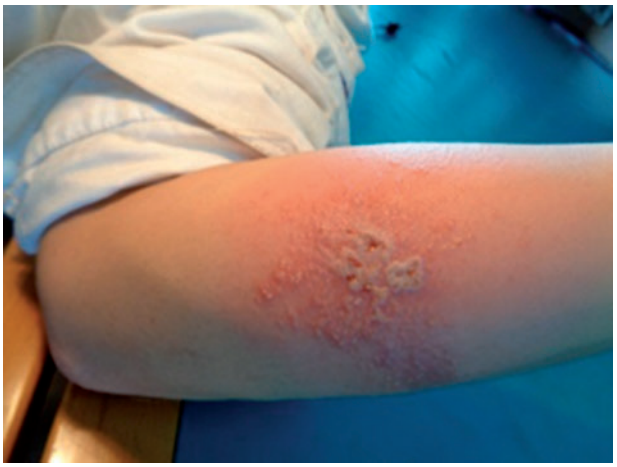

Figure 1. Image of lesion, day 3, demonstrating confluence of vesicles, increased vesicles and bullae

Figure 2. Image of the culprit insect, with characteristic appearance of *Paederus* species

most Staphylinidae, adults in this group are diurnal and so are more likely to encounter humans. Additionally, adults readily fly to artificial lighting.

Cutaneous exposure to the insect's haemolymph occurs when the insect is crushed on the skin, causing a characteristic dermatitis, paederus dermatitis (alternative disease names have been used in describing this condition[2], including dermatitis linearis, rove beetle dermatitis and blistering beetle dermatitis[3] among many others). Pederin, the toxin responsible for the dermatitis, is a vesicant, a direct cytotoxin, an antimitotic and a protein synthesis inhibitor; due to its properties, compounds of the pederin family have been investigated for use in treating cancer.[4] Pederin skin exposures can cause mild, moderate, to severe (systemic) adverse effects. Mild dermatitis may occur, with erythema after 24 h lasting up to 48 h. Moderate dermatitis is characterized by initial marked erythema and pruritus, with vesicles developing after 48 h and reaching a maximum up to 96 h post exposure. Severe dermatitis has cutaneous effects similar to moderate cases, with additional systemic symptoms including fever, neuralgia, arthralgia and vomiting; the erythema may last for months post exposure.[2]

The clinical differential diagnosis for paederus dermatitis includes bullous impetigo, herpes simplex, herpes zoster, contact dermatitis (allergic or irritant), burns and phytophotodermatitis.[5] Moderate cases, such as presented here, often self-resolve within 2–4 weeks and typically require only local therapy; there is some evidence supporting use of oral antibiotics to prevent infection and reduce healing time.[6] Individual cases and outbreaks have been reported in many countries worldwide.[5]

Risks of paederus dermatitis are high in wet tropical environments with artificial light sources, including tropical ports. Therefore, paederus dermatitis may be considered an occupational hazard for seafarers and others working around ports. Physicians who treat seafarers should be aware of this condition and consider advising preventive measures.

Recognizing the occupational and environmental risk factors for military personnel,[7] the United States Army Public Health Command published educational material to prevent paederus dermatitis, including instructions to avoid high-risk areas, such as beneath powerful artificial lights in identified endemic *Paederus* habitats (marsh and wetlands).[8] Environmental controls such as pesticide application[3] and placement of netting around artificial lights[9] have successfully controlled outbreaks of paederus dermatitis in high-risk environments. Proper personal protection such as wearing long sleeve shirts, long pants and insect repellent may be advised to reduce risk of *Paederus* exposure. Exposure to the pederin toxin and the resultant dermatitis can also be avoided by not crushing the insect or forcefully brushing it off.

As an internationally traveling workforce, seafarers have unique occupational health risks including travel-related illnesses; superimposed on these risks is the additional challenge that seafarers frequently work far from accessible medical care.[10] Therefore, appropriate prevention and preparation, supported by telemedicine services, are paramount. Physicians caring for seafarers and other at-risk traveling workers should recognize *Paederus* as a potential hazard and counsel regarding preventive measures. Importantly, this case demonstrates how telemedicine and multidisciplinary collaboration can achieve the correct diagnosis in challenging remote medical consultations for seafarers and other at-risk traveling workers. Telemedicine and global medical networks for remote workers with limited healthcare access are increasingly important for workers in our globalized economy,[11–13] and seafarers are no exception.

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