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Case report

Ocular manifestations due to econda (*Paederus sabaeus*)

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Introduction

Outbreaks of periorbital dermatitis, or keratoconjunctivitis in Central Africa related to insect are most often due to *Paederus sabaeus*. This ocular involvement is popularly known as the 'Nairobi eye'.^{1–3} *Paederus sabaeus* (Econda) belongs to genus *Paederus*, family Staphylinidae, order Coleoptae, class Insecta and are distributed worldwide, mainly in tropical and subtropical region except Antarctica.^{4,5} Nairobi eye is quite common in Congo especially during the rainy season. These case reports aims in creating awareness and enumerating the varied presentations and management.

Case report

Case 1

A 46-year-old male, an United Nation (UN) staff, presented with a history of Econda entering the left eye late in evening as he was leaving office. On a natural reflex, he rubbed his left eye which immediately resulted in a burning sensation, redness, watering, and foreign body sensation. He reported the next day

with complaints of pain, photophobia, watering, foreign body sensation, decreased vision, and lid swelling in the left eye.

Distant visual acuity (DVA) in the right eye was 6/6 and both the anterior and posterior segments was normal. Distant visual acuity in left eye was 'counting finger' at 1 m. There was marked oedema with erythema of lids, blepharospasm, and severe conjunctival congestion. The eye showed extensive corneal epithelial defect with central and peripheral cornea taking up the fluorescein stain (Fig. 1). There were no keratic precipitates/flare/cells in the anterior chamber, pupil was normal reacting, and lens clear. The fundus was hazily seen but normal. Intra ocular pressure (IOP) was 12.2 mmHg in both eyes. The diagnosis made was that of Econda blepharo-keratoconjunctivitis.

The left eye was given pad and bandage with 2 % homatropine eye drops and ciprofloxacin (0.3%) ointment. He was started on tablet vitamin C (500 mg) 1 tab 8 hourly, tablet Brufen (400 mg) 1 tab eight hourly, and tablet Cetirizine (10 mg) 1 tab once daily (OD). Vision improved to 6/18 the next day and corneal epithelial defect had healed but corneal oedema and haze persisted. He was started on ciprofloxacin (0.3%)-dexamethasone (0.1%) eye drops 4 hourly, moisol eye drops 4 hourly, and flurbiprofen (0.03%) eye drops 6 hourly. On the third day lid oedema decreased and ulcerative lesions were seen on lid (Figs. 2 and 3). Ciprofloxacin (0.3%)-dexametha-

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Fig. 1 – Fluorescein staining showing the extent of corneal damage. Note the lid swelling and erythema in periorbital region.

sone (0.1%) eye ointment was started for local application over eyelids 12 hourly. At the time of discharge (seventh day) DVA in left eye was 6/6 and lid lesions had healed with hyperpigmented scar marks (Fig. 4). Patient was reviewed regularly and by one month the hyperpigmented scar disappeared.

Case 2

A 29-year-old officer in UN mission presented with history of accidentally rubbing Econdra over his left eye at night while he was checking the guard post. He was initially managed by the unit doctor with gatifloxacin eye drops. He reported to our hospital on the third day with complaints of pain, redness, swelling of eyelids, and watering of the left eye.

Distant visual acuity in both eyes was 6/6. The left eye showed mild lid oedema, erythematous discolouration of skin in periorbital region, and linear vesicular lesion over lower lid. The conjunctiva was congested and cornea clear (Figs. 5 and 6). The patient was managed as a case of Econdra periorbital

Fig. 2 – Periorbital region showing ulceration of skin and persisting lid oedema on the third day.

Fig. 3 – Clear cornea with healed epithelial defect and conjunctival congestion on the third day.

dermatitis with conjunctivitis by ciprofloxacin-dexamethasone eye drops four hourly, flurbiprofen eye drops six hourly, moisol eye drops six hourly, ciprofloxacin-dexamethasone eye ointment for local application over eyelids 12 hourly, tablet Brufen one tab eight hourly, and tablet Cetirizine one tab OD. The officer was reviewed after three days when lid oedema had subsided, the vesicular lesion regressed and conjunctival congestion had decreased. He was reviewed again after seven days when his left eye had recovered completely with resolution of vesicular lesion.

Case 3

A 35-year-old soldier in UN mission presented with complaints in right eye of redness and swelling of eyelids following rubbing Econdra over right eye in the evening. The soldier had washed his eyes thoroughly with plenty of water immediately after the incident. Distant visual acuity in both eyes was 6/6. The right eye showed lid oedema and erythematous discolouration of both eyelids. There was no conjunctival congestion and cornea was clear. He was

Fig. 4 – Periorbital skin showing scabbed lesions and hyperpigmented scar.

Fig. 5 – Unilateral periorbital dermatitis with conjunctivitis showing lid oedema, erythematous discolouration, conjunctival congestion, and clear cornea.

managed as a case of *Econda* periorbital dermatitis by ciprofloxacin-dexamethasone eye ointment for local application over eyelids 12 hourly, tablet Brufen 1 tab eight hourly, and tablet Cetirizine 1 tab OD and recovered in a week's time.

Discussion

The three major groups of blister beetles are Oedemeridae, Meloidae, and Staphylinidae. The vesicant chemical in Oedemeridae and Meloidae is cantharidin. The blister beetles of family Staphylinidae, genus *Paederus* releases pederin when crushed. Since the vesicant agent released is different, clinical presentation differs among the three families.⁶ Since all the cases in this report were due to *Econda*, the discussion is restricted to it.

Three cases with ocular involvement as result of contact with *Econda* reported between August 2010 and May 2011. In

a similar study by Vasudevan et al in Congo, four cases had periorbital involvement of a total of 154 cases of Staphylinid beetle dermatitis.⁷ In another study in Tanzania, two cases of periorbital dermatitis and one case of keratoconjunctivitis following contact with blister beetle have been reported.⁸ Gnanaraj et al reported periorbital involvement in 4.9% of their cases in South India.⁹

Econda can fly, but prefer to run and are extremely agile (Fig. 7). Because they breed in wet rotting leaves and soil, increased contact between human and these beetles occur after rain showers and/or during the rainy season or an exceptionally wet year.^{1,4} The three cases which reported to Level III Hospital were in November and December, coincides with the rainy season in Congo (south of equator) as reported by Vasudevan et al. *Econda* is most active after sunset until mid-night and accidentally comes in contact with persons near bright lights as in this report.^{7,10} They are attracted more towards fluorescent lights as compared to incandescent bulbs probably because it emits cool light. The beetle does not bite or sting, but when crushed or brushed against skin, releases a toxic chemical known as pederin from its haemolymph. Pederin ($C_{25}H_{45}O_9N$) is an amide with two tetrahydropyran rings. It is vesicant and blocks mitosis by inhibiting protein and deoxyribo-nucleic acid synthesis without affecting ribonucleic acid synthesis. Pederin causes itching, burning, erythema, and oozing resulting in vesiculobullous eruption in the area of contact. It does not affect the palms or soles of the feet.⁴

Ocular symptoms are usually secondary to transfer by the fingers of the pederin from elsewhere on the skin, usually exposed skin of the face, neck or arms. However, ocular area may be the only site of involvement as in all cases of this report. Ocular presentation usually unilateral due to pederin is periorbital dermatitis with or without keratoconjunctivitis. Patients with mild periorbital dermatitis have continuous pain from the onset and develop slight erythema within 24 hours which last for approximately 48 hours. Cases with moderate to severe exposure to toxin develop severe neuralgia and marked erythema about 24 hours after contact followed by a vesicular stage 48 hours later. The vesicles, not

Fig. 6 – Unilateral periorbital dermatitis with conjunctivitis. Note the characteristic linear vesicular lesion over lower lid and periorbital region.

Fig. 7 – *Paederus sabaeus* (*Econda*) is 7–10 mm long and 0.5–1 mm wide. Note the black coloured head, elytra (covers the wings), and lower abdomen and red coloured thorax and upper abdomen.

restricted to one der- matomes are usually linear that enlarge gradually and attain maximal development within another 48 hours (Fig. 6). This is followed by a squamous stage, when the vesicles become umbilicate, dry out over about 10–12 days, and exfoliate to leave hyperpigmented scars that persist for a month or more (Fig. 4). The vesicles can turn into pustules. The toxin is a very weak base and does not have noticeable acid-base properties when it enters the eye causing conjunctivitis with or without keratitis. Unlike other chemicals the toxin is unable to permeate through the cornea causing inflammation of the deeper structures; the damage is hence limited to the cornea and conjunctiva. The only complication noticed was post-inflammatory hyperpigmentation of the skin in periorbital region which disappears by one month.

In this study patient with conjunctival and corneal involvement responded to topical steroid along with topical antibiotics, analgesics, and lubricating eye drops. The skin lesion in periorbital region responded very well to ciprofloxacin- dexamethasone eye ointment along with oral analgesic and antihistaminics. The third case had no vesicular lesion on lid because less quantity of toxin came in contact with eyelids as it was washed off by the patient. Hence, immediate washing or flushing with water of deposited pederin from the periorbital area reduces the severity of symptoms.

Clinical appearance can be confused with herpes simplex, herpes zoster ophthalmicus, acute allergic or irritant contact dermatitis, and millipede dermatitis.^{1,4} The characteristic linear lesions in exposed areas not following the dermatomes and epidemiological features, i.e. occurrence of similar cases in a given area, the seasonal incidence and identification of the insect help the ophthalmologist to arrive at the diagnosis. Preventing human/ beetle contact is the primary method of preventing pederin based ocular manifestations.^{1,7} Simple preventive measures based on the behavioural pattern of this nocturnal beetle can help reduce the incidence.

Conflicts of interest

None identified.

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