Acute haemorrhagic conjunctivitis epidemics and outbreaks of Paederus spp. keratoconjunctivitis (‘Nairobi red eyes’) and dermatitis

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An epidemic of acute conjunctivitis in Dar es Salaam in 2010 demonstrated the importance of a strong infectious diseases epidemiological surveillance network to minimise disease outbreaks. Misunderstanding of the causes and management of diseases explains the repetitive nature of acute haemorrhagic conjunctivitis (AHC) in Dar es Salaam. This paper discusses AHC and Paederus spp. keratoconjunctivitis and periorbital oedema (‘Nairobi red eyes’) that are confused as being associated with recurrent epidemics of conjunctivitis in Dar es Salaam.

Many cases of conjunctivitis were reported in mid-2010 in Dar es Salaam, of a kind that has been reported in the region since the 1980s. Conjunctivitis is generally caused by an allergic reaction or infection (usually viral but sometimes bacterial). The causes have been confused by health care personnel in developed and developing countries. Conjunctivitis epidemics in Tanzania, regardless of their causes, are called ‘Nairobi red eyes’ or ‘Nairobi eyes’. The resulting labelling of all conjunctivitis epidemics in Dar es Salaam as ‘Nairobi red eyes’ is incorrect because Nairobi red eyes or Paederus spp. (Nairobi fly, Rove beetle) keratoconjunctivitis occurs very rarely.

Conjunctivitis epidemics in Dar es Salaam have been due to enteroviruses 70 (EV-70), coxsackie virus A24, adenoviruses and gonococcal ophthalmia, which cause photophobia, watering, foreign body sensation, eyelid oedema, conjunctival haemorrhages and superficial punctuate keratitis (acute haemorrhagic conjunctivitis). They are not associated with Rove beetle/Nairobi fly.

Paederus conjunctivitis (‘Nairobi eyes’) and dermatitis outbreaks

Paederus dermatitis and conjunctivitis outbreaks have been reported since the earliest recorded times. The third and fourth plagues in Exodus in the Old Testament are believed to have been due to Paederus arfieri. In Africa, Paederus dermatitis was first reported in 1915 and documented in East Africa (then British East Africa) in 1916. The effects of Paederus species have been reported in Leopoldville (Kinshasa) in 1921, in Freetown in 1925, India in 1933, Sudan in 1958, and in Nyasaland (now Malawi) and Tsumeb (Namibia) in 1962. More recently, Paederus conjunctivitis and dermatitis have been reported in India, China, Iran, Nigeria, Sri Lanka and Guinea.

In Tanzania, Paederus dermatitis and conjunctivitis occurs mainly during the rainy season (March and October) in the north (Kilimanjaro and Arusha), with no cases in the coastal region, so excluding Paederus (Nairobi fly) as a cause of conjunctivitis in Dar es Salaam, as reported by many.

Conjunctivitis from Paederus is rare. The beetle affects mostly the skin after contact with the body and releasing pederin toxins. Conjunctivitis results from transferring toxins by finger to the eyes (Nairobi eyes). The rapid spread and mechanism of transmission of conjunctivitis reported in Dar es Salaam are unlike that of Paederus conjunctivitis, which is slow and occurs rarely.

Rove beetles (Paederus spp.)

Several species of Paederus cause ‘Nairobi red eyes’. The genus Paederus is widely distributed worldwide and belongs to the family Staphylinidae of the order Coleoptera. Of the approximately 3 000 species of Staphylinidae, 600 occur in tropical and temperate climates. In the order Coleoptera, only Melololoe, Oedemeridae and Staphylinidae release vesicant chemicals that cause dermatitis and conjunctivitis (the first two release cantharidin and the latter, pederin). The genus Paederus comprises more than 622 species.

The name ‘Nairobi fly’ is applied to Paederus sabaus Erichson and Paederus crebrepunctatus that both cause dermatitis and conjunctivitis in East Africa. They are morphologically similar, with a narrow body, black head, at least two abdominal segments, and the prothorax and the first 5 abdominal segments are russet coloured (Fig. 1). They range in length from 10 - 15 mm, can fly but prefer to run, neither bite nor sting, cause irritation and blistering if crushed against the skin or eye, and are attracted to artificial light sources.

Paederus breeds in wet, rotting leaves and soil. Their population increases rapidly in the rainy season and diminishes in the dry season. In East Africa, outbreaks of Paederus dermatitis and conjunctivitis were mostly reported in Kenya and northern Tanzania after the 1997/1998 El Niño rains.

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Paederus dermatitis is caused by accidentally crushing the insect against the skin, so releasing coelomic fluid that contains pederin, a potent vesicant. This causes an acute irritant-contact dermatitis within 24 hours, which may be associated with bullae or pustulae. ‘Kissing lesions’ can occur after spreading of pederin to adjacent skin surfaces, usually flexural e.g. the elbow. Skin lesions heal after 10 - 12 days, with transient post-inflammatory hyperpigmentation; they may be confused with allergic or irritant-contact dermatitis, thermal burns, herpes zoster, dermatis artefacta, herpes simplex, bullous impetigo and phytophotodermatitis.20-24

Ocular involvement is usually secondary to rubbing the eyes with hands contaminated with vesicant fluid. Oedema, conjunctivitis and excess lacrimation are common and termed ‘Nairobi eyes’.20 The effect of toxins is usually limited to the conjunctiva, and corneal scarring and iritis are rare.20,23 Bilateral Paederus conjunctivitis is uncommon, providing further proof that ‘Nairobi fly’ is not responsible for epidemics in Dar es Salaam, where most cases were of bilateral conjunctivitis.

In East Africa, local remedies (e.g. toothpaste and mud) are used to treat Paederus dermatitis, though all are ineffective.20 The use of cold compresses or saline solution may help to reduce the swelling. The use of eyedrops with antiseptic and anti-inflammatory properties has not been effective.20 The combination of non-steroidal anti-inflammatory drugs (NSAID) and corticosteroids may be helpful.20,23 Oedema, conjunctivitis and foreign body sensation, rash, redness of eyes with subconjunctival haemorrhages and epiphora (Fig. 2).20 Initially unilateral, it becomes bilateral within 24 hours and may persist for 3 - 7 days before spontaneous resolution. Mismanagement (including self-medication and consulting traditional healers) can result in corneal perforation, panophthalmitis and blindness.30-33 In Asia, rare cases of polio-like paralysis have been linked to enterovirus 70 and coxsackievirus A24.32

Acute haemorrhagic conjunctivitis (AHC) epidemics

The magnitude of an epidemic of conjunctivitis in 2010 in Tanzania can be directly linked to enterovirus 70 and coxsackievirus A24. Numerous epidemics have been documented worldwide, and the clinical and epidemiological features of conjunctivitis in Dar es Salaam are similar to those in other countries. Outbreaks of conjunctivitis in Dar es Salaam move rapidly, and are associated with AHC rather than Paederus spp. conjunctivitis (‘Nairobi red eyes’). A few cases of gonococcal ophthalmia were reported 1984,4 but increasing numbers contribution to its spread.30-32

The disease affects all age groups, is self-limiting and is characterised by abrupt onset of ocular pain, eyelid oedema, foreign body sensation, rash, redness of eyes with subconjunctival haemorrhages and epiphora. This genus, together with adenovirus, is associated with epidemics of conjunctivitis all over the world.

Entervirus infections have many clinical outcomes e.g. poliomyelitis, aseptic meningitis, hand-foot-mouth disease, herpangina and acute haemorrhagic conjunctivitis. Many epidemics of AHC are linked with influenza pandemics and other enterovirus serotypes e.g. poliovirus type 1 (wild).32 AHC occurs mostly in tropical coastal areas during and after rainy seasons (in some parts of the world, AHC epidemics occur during dry, dusty, windy seasons). Large epidemics of AHC are limited to the eastern hemisphere and Africa, where overcrowding and unhygienic living conditions contribute to its spread.30-33

In settings with limited hygiene, AHC can be diagnosed clinically or by excluding common bacterial infections (bacterial cultures: absence of bacterial growth prepared from the conjunctival swabs of patients, denotes viral or fungal infections), but tissue cultures and virus isolation, nucleic acid detection methods and serology testing are recommended.11

AHC epidemics can be prevented by personal hygiene, discouraging the sharing of towels and toiletries etc., frequent hand washing, and elimination of crowded living conditions.12,13

References
ORIGINAL ARTICLES


Accepted 9 November 2010.