Picture Quiz:

Know your enemy

Case history

A 22 year old man visits his general practitioner for advice on an "itchy rash" which has developed overnight. The young man had just returned from a fishing trip on a loch near the village of Fort Augustus in the Highlands of Scotland, famed for its position at the bottom end of Loch Ness. He and a friend had camped on the shore of the fishing loch. On closer examination the doctor noted an urticarial rash spread all over the man's face, neck, hands, and forearms (figures 1 and 2)—that is, the exposed areas of the body that were not covered by clothing while fishing.

Fig 1

Questions

(1) What is the cause of the rash?
(2) What advice should the doctor give on current management of symptoms?
(3) Are there any suggestions the doctor can give on prevention for the future?

Answers

(1) The rash has been caused primarily by midge bites to which the patient has had a hypersensitive reaction. His friend who accompanied him on the trip was also bitten, but did not develop as severe a rash.
(2) A simple non-prescription antihistamine tablet available from the chemist should relieve the itching and inflammation. Many topical sprays and ointments are also available for use on midge bites.
(3) Midge season is from April to October, but the serious biting takes place between mid-June and August. Midges tend to avoid direct sunlight, heavy rain, and wind. On days when it is overcast and with little wind, it is sensible to cover up as much as possible. Avoid wearing dark colours, which are said to attract the insects. Any exposed parts should be protected with a suitable repellent containing dimethylphthalate (DMP) or dimethylmetatoluamide (DEET), available from most chemists.[1] A range of traditional herbal remedies have been used to varying success, including myrica gale oil (also known as bog myrtle).[2]

Fig 2

Discussion

Midge bites might appear a fairly trivial complaint. But occasionally people may develop intense and distressing itch and inflammation over the affected area. Secondary infection may occur as a result of scratching.

The midge is a member of the order Diptera, the true or two winged flies. They share several common features with the mosquito, but are more closely related to the blackflies (Simuliids) and non-biting chironomid midges. There are 37 known species of biting midges in Scotland, but only one is responsible for up to 90% of the attacks on humans—*Culicoides impunctatus*, also known notoriously as the highland midge or meanbh chuileag (tiny fly) in Gaelic. Amazingly this insect, which causes grown men to run for cover, has a mere 1.4 mm wingspan. Midges are attracted to humans via a combination of carbon dioxide and sweat. Chemical differences in sweat influence the attractiveness of the individual, explaining why some people are bitten more than others. The males do not bite; only the females, who need a blood meal to mature all but their first batch of eggs. They have a specially developed maxilla and mandibles that cut in a scissor-like motion down through the skin and into a capillary. Saliva is pumped into the wound to prevent clotting, but the foreign antigens in this saliva set off an immune reaction.[1] If the person has been exposed before (as in the case of the angler who had visited the area many times in the past) then the body will respond to the antigen with IgE antibodies—an atopic reaction. Cross linking of the IgE by the antigen causes degranulation of mast cells with a release of histamine and leukotrienes.[3]

Atopy is a form of Gell and Coombes' type I hypersensitivity, where a seemingly harmless foreign antigen causes the immune system to overreact. Patients with a bad reaction to midge bites are likely to have a history of eczema or asthma, which are other conditions within the atopic spectrum.[3] Some species of midge have been shown to induce asthma in those exposed repeatedly.[4]

Despite the fact that an individual midge may attack more than one person, the Highland midge is not known to be a vector of blood borne disease in the same way as the mosquito.[1]

Biting midges are thought to have a serious impact on the Highland economy. Industries like tourism and forestry suffer the most. Hobbies such as fishing and hiking can be made unbearable by the presence of the midge.[1]

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