

Treatment of mosquito bites with cetirizine

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Summary

Eighteen adult subjects sensitive to mosquito bites participated in a double-blind, placebo-controlled study with 10 mg cetirizine. The drug was given prophylactically and the subjects were then exposed to bites of *Aedes communis* mosquitoes in the field. Bite lesions were measured and pruritus was scored with a visual analogue scale at 15 min, 60 min, 12 hr and 24 hr. Cetirizine significantly decreased immediate wealing and pruritus and, interestingly, also had a clear effect on the delayed 12 hr and 24 hr bite papules and pruritus. The diameter of a 15 min mosquito-bite weal was 10.1 ± 10.4 mm (mean $\pm$ s.d.) with the placebo and 5.9 ± 5.9 mm with cetirizine treatment ($P < 0.05$). The 15 min pruritus scores were 36.0 ± 25.2 and 11.2 ± 13.2 ($P < 0.001$), respectively. The diameter of the 24 hr mosquito-bite lesion was 12.6 ± 21.9 mm with the placebo and 7.4 ± 16.1 mm with cetirizine treatment ($P < 0.01$). The 24 hr pruritus scores were 18.9 ± 25.5 and 6.6 ± 14.8 ($P < 0.01$), respectively. These results indicate that, in mosquito-sensitive subjects, prophylactically administered cetirizine is an effective drug against both immediate and delayed mosquito-bite symptoms.

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Introduction

In tropical climates mosquitoes are important vectors of infectious diseases such as malaria and yellow fever. Mosquito bites can also, by themselves, provoke unpleasant pruritic skin lesions. These vary from common weal-and-flare reactions and delayed papules to more rare Arthus-type lesions with systemic symptoms [1–3]. In many areas of the world, massive and disturbing mosquito infestations may occur, e.g. in Alaska it is possible to be bitten by mosquitoes as many as 1000 times in one hour. Under such conditions, complete avoidance of bites is impossible without use of effective repellants and protective clothing [4]. In Scandinavia, most people are frequently bitten during the mosquito season, resulting in immediate and delayed lesions with accompanying pruritus [5]. Topical treatment with over-the-counter sticks, creams and lotions containing antihistamines, hydrocortisone or other antipruritic agents is common. However, only a few studies have been made on the effects of these products, and in one controlled study, a 2% pyribenza-

mine antihistamine cream showed no effect on the bites of *Aedes aegypti* mosquitoes [6].

Recent studies by our group suggest that an oral antihistamine, cetirizine, is effective in the treatment of mosquito bites. In our first study, we exposed healthy subjects to *Aedes aegypti* bites under laboratory conditions, and showed that 20 mg cetirizine significantly reduced immediate pruritus [7]. In the second study, after receiving either 10 mg cetirizine or a placebo, healthy volunteers were exposed to *Aedes communis* mosquito bites in the field. This study showed that cetirizine also significantly reduced immediate wealing [5]. In the present study we examined the effect of 10 mg cetirizine in subjects presenting with large immediate or delayed mosquito bite lesions.

Patients and methods

Patients

Twenty-eight adult subjects suffering from large and/or intensively pruritic mosquito-bite lesions for at least two mosquito seasons were accepted for the study. Twenty-three were patients who had sought medical advice for the bites and had been referred to the Departments of

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amount of cetirizine (10 mg) as in the present study and performed the mosquito exposures according to the same protocol, but did not observe any significant effect on the delayed symptoms. One reason for this discrepancy may be the much stronger delayed skin reactivity of the present mosquito-sensitive subjects. In these, the mean diameter of the delayed bite papule was about three times larger (mean diameter 12.6 mm) than it was in the normal subjects in our previous study (mean diameter 4.0 mm). In addition to its anti-H1-blocker activity, there is good evidence that cetirizine also has an effect on eosinophil migration, and decreases cutaneous late-phase allergic responses [16–18]. It is possible that the delayed mosquito-bite lesions could have a similar pathogenesis. The presence of eosinophils is a common histological feature for persistent insect bite reactions and there is evidence that eosinophils may also occur in abundance in mosquito-bite lesions [1,9,19,20].

The clear benefit for people experiencing harmful mosquito-bite reactions is that they can take cetirizine prophylactically when visiting areas where bites cannot be avoided, e.g. Lapland, and the marshy regions of Florida. In practice, smaller bite lesions and a clear decrease in the amount of pruritus is a great help to people who are sensitive to mosquito bites. During the present trial, several subjects found it most helpful that the delayed symptoms became milder. In contrast to immediate wealing, the delayed bite papules and accompanying pruritus produce discomfort for many hours, even disturbing sleep, and may continue to do so for several days. In these sensitive subjects, the repetition of this nuisance every mosquito season calls for effective treatment. Present results show that 10 mg cetirizine was both effective and well tolerated. However, the best dosage for the most sensitive subjects could be higher than 10 mg daily. We also need information on other non-sedating antihistamines, such as terfenadine and astemizole, if these drugs can control the immediate and especially the delayed mosquito-bite symptoms as effectively as cetirizine.

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