

Fixed eruption due to quinine contained in tonic water: positive patch-testing

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A fixed drug eruption is a cutaneous adverse drug reaction that is characterized by recurrent site-specific lesions each time the responsible drug is taken. In some instances, no causative agent is identified. Few cases of fixed eruption following food ingestion have been described (1). We report a case of fixed eruption elicited by quinine contained in tonic water.

Case Report

A 57-year-old woman experienced repeated episodes of well-demarcated erythematous and oedematous plaques, sometimes bullous, on her wrists, thumbs (Fig. 1) and right hypothenar eminence, lips, and right ear, which resolved in a few days leaving residual pigmentation. The eruptions recurred at the same sites during the summer months for 3 years in a row. Fixed drug eruption was diagnosed and supported by skin biopsy. No relationship with any drug intake was found but 2 hrs before the onset of symptoms of the last episode, she had consumed a glass of tonic water (Schweppes®). She would only drink tonic water in the summer.

Patch tests were performed 5 weeks later with Schweppes® 'as is', Hexaquine® (quinine benzoate, and thiamine chlorhydrate) 30% pet., Nivaquine® (chloroquine) 30% pet., and quinine chlorhydrate 30% pet. both



Fig. 1. Recurrence of fixed drug eruption.



Fig. 2. Positive patch test reaction with Schweppes® after D4 on the affected skin (+++).

on affected and normal skin. Patch tests read at 4D were positive only on previously involved skin sites with Schweppes® (++) (Fig. 2) and quinine chlorhydrate (+). Tests performed with Hexaquine® and chloroquine were negative.

Thus, we concluded that the causative agent of her fixed eruption was quinine, which is contained in Schweppes®. No relapse was seen after she stopped ingesting quinine.

Discussion

Identification of the causative agent in fixed drug eruptions may be difficult, especially when several different drugs are considered or when any drug ingestion is denied. Patch tests on residual pigmented plaques and on normal, not involved skin can help identify the causative agent. Sometimes, the eruption is caused by food (1). Recently, Splingard et al. described the first case of neutrophilic fixed food eruption (2) after fish ingestion.

Quinine is a natural alkaloid. Tonic water contains cinchona bark or quinine as flavouring agents. Major active compounds of cinchona bark are quinine, quinidine, cinchonine, and cinchonidine (3). A litre of tonic water (Schweppes®) contains about 80 mg of quinine (4). In the USA, the Food and Drug Administration limits the quinine contained in tonic water to 83 p.p.m. (5).

In 2007, Muso reported two cases of fixed eruption due to quinine contained in tonic water (6). Both patients exhibited positive patch tests with quinine sulfate and oral provocation tests with tonic water. Likewise, Asero reported a case of fixed eruption induced by tonic water in which patch testing was negative with a 20% quinine sulfate solution (both in water and alcohol), but with a positive open oral challenge with quinine sulfate (7).

In our case, patch testing with tonic water ('as is') and quinine chlorhydrate 30% pet. were positive, whereas quinine benzoate was negative, suggesting that only the chlorhydrated form of quinine contained in tonic water could induce fixed eruption in our patient.

Quinine contained in tonic water has also been implicated in a case of thrombocytopaenic purpura (8), in toxic epidermal necrolysis (9), as well as in a case of allergic urticaria, in which tonic water skin prick tests at a 1:10 dilution, as well as with quinine sulfate and an oral challenge were both positive (10).

Quinine and chloroquine share a common quinolein core, which suggests cross reactivity. Patch testing with chloroquine was negative in our patient, but Nyunga reported a case of urticaria related to Hexaquine® intake (11) with a positive chloroquine oral provocation test.

Despite negative patch tests with chloroquine, we advised our patient to avoid anti-malarial drugs, even though we did not perform oral provocation tests.

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