

Chewing-Gum Preservative Induced Toxidermic Vasculitis

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This paper reports the case of a young female patient who presented with a cutaneous urticarial disseminated eruption. Drug-induced side effects were eliminated, and the only recent dietary change was the regular use of chewing-gums containing chlorophylla (E140), menthol and BHT (butylhydroxytoluene). Immunohistological analysis of a cutaneous lesion revealed signs of vasculitis. Within 1 week after stopping chewing gum, the eruption subsided. Oral provocation tests at 4-day intervals confirmed the responsibility of BHT by the reinduction of the cutaneous signs after a few hours.

Key words: butylhydroxytoluene; challenge; toxidermic vasculitis.

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Adverse reactions to food additives have been widely reported since Lockey's first description (7, 8). Such substances are known to be responsible for eliciting asthma, rhinitis, urticaria and angioedema (2, 6, 9, 10, 11, 13, 16). Azoic dyes, sodium benzoate and sodium metabisulfite are most commonly involved. The reported case of cutaneous eruption was proved to be induced by butylated hydroxy toluene (BHT), a common antioxidant, seldom evoked in the literature of food additives' adverse reactions.

M. G., a 30-year-old female, was referred to the department of immunoallergy for a disseminated eruption involving the legs, forearms, abdomen and back. This urticarial pathology lasted for 3 weeks, evolving in three stages: typical urticaria was followed by plane erythematous macula which finally resolved in violine-brown lesions (Figs. 1, 2). The patient's story was uneventful. She used no anti-contraceptive drugs and had no recent change of habits, apart from daily consumption of chewing-gum for the past 3 months. Prick tests and intradermal reactions to common inhalants and

a panel of food antigens were negative. Biological investigations showed normal blood counts, ESR, complement levels, and electrophoresis. There was no biological signs of viral hepatitis, and no auto-antibodies to basement membrane, intercellular spaces or nuclear components. IgE level, detected by PRIST test, was 90 UI/ml.

Light microscopy analysis of the biopsy of both an urticarial and a plane lesion showed heavy perivascular lymphoid infiltration in the upper dermis. Mast cells were scarce and undegranulated. Direct immunofluorescence analysis only evidenced heavy fibrinogen suffusions in an urticarial lesion. The second biopsy contained significant vascular deposits of IgM, C1q, C3 and C9 complement components, together with fibrinogen suffusions.

The patient was given no specific therapy, but was advised to stop chewing-gum consumption. All cutaneous lesions disappeared within a week. After 1 month, a series of single blind oral challenges was performed, at 4-day intervals. The chewing-gum used by the patient contained BHT (E321), menthol and chlorophylla (E140). No clinical response was in-

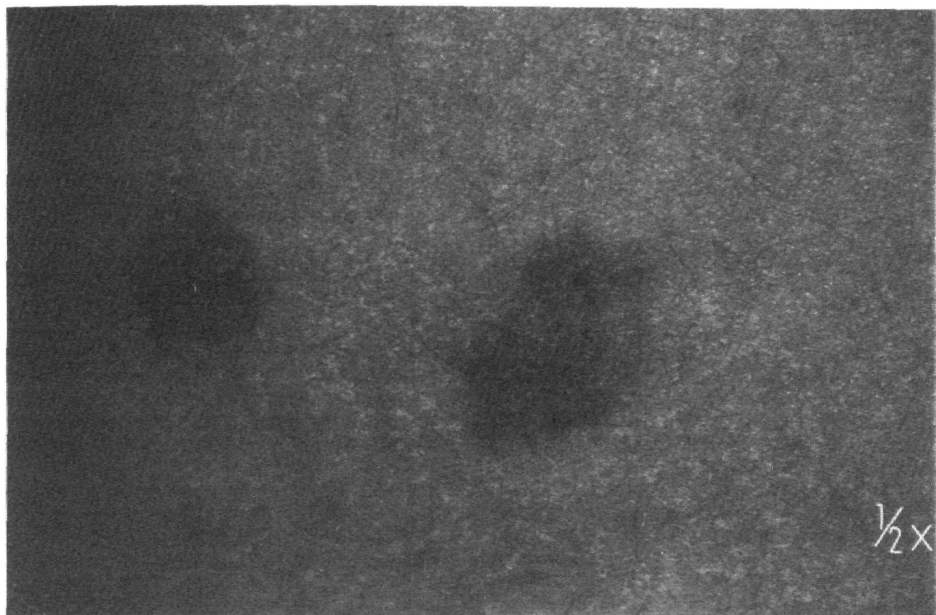


Fig. 1. Macroscopic view of cutaneous lesions of the lumbar region after ingestion of BHT.

duced by placebo (calcium carbonate in a colourless pill) or chlorophylla (10 mg). Cutaneous lesions similar to initial ones appeared within a few hours of BHT ingestion. The patient was advised to avoid all food supplemented with BHT. After 1 year, she is still in perfect health. A diagnosis of BHT-induced toxidermy was considered, with probable immunologic involvement.

Such observations have seldom been reported, although BHT appears to be a common additive used as antioxidant in food oils and fats. It can be found in packet cake mix, some margerines, crisps, salted peanuts, dehydrated potatoes, breakfast cereals, chewing-gums (4), but also in plastic wrappers (11). Previous reports described sensitization to BHT-containing oils, with food reactivation responsible for contact dermatitis (13). In one case of urticaria, the patient's story included frequent contact with BHT-containing plastic foil, and the etiology was demonstrated by positive prick and patch tests (11). Juhlin et al (6) and Thune

& Granholt (16) detected 15% positive tests after oral challenge of patients with chronic urticaria. Animal studies demonstrated toxic liver and pulmonary disorders in mice and rats (3, 5, 15) as well as behavioural disorders in the litters of sensitized animals (17).

In cutaneous lesions, allergic reactions involving IgE-dependent or delayed-type manifestations are commonly evoked (6, 13). Toxic mechanisms are not fully understood. The chemical properties of BHT suggest other possible phenomena. As an antioxidant, BHT may scavenge lipid peroxyradicals, and inhibit arachidonic acid metabolism (12). Cyclooxygenase inhibition and lipooxygenase stimulation were demonstrated by Agradi et al. (1). Increased synthesis of leucotrienes could be involved in the pathogenesis of non-immunologic urticaria or asthma. Immune complex-mediated toxidermy is most likely involved in the case reported here, owing to the pathognomonic images observed in immunofluorescence. The reaction could involve BHT itself

or a metabolite. Cutaneous vasculitis of this type classically involves drugs, and sometimes colourings (14). We feel that food preservatives such as BHT, and eventually other antioxidants, should be added to the list.

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