

Systemic Contact Dermatitis Elicited by Oral Intake of Balsam of Peru

Wolfgang Pfützner, Peter Thomas, Andrea Niedermeier, Christiane Pfeiffer, Christian Sander and Bernhard Przybilla
 Klinik und Poliklinik für Dermatologie und Allergologie, Ludwig-Maximilians-Universität München, Frauenlobstr. 9–11, DE-80337 München, Germany. E-mail: Wolfgang_Pfutzner@web.de
 Accepted February 20, 2003.

Sir,

Balsam of Peru (BP) is a natural product derived from the resin of *Myroxylon balsamum* (L.) Harms var. *pereirae* (Royle) Baillon, a tropical tree growing in Central and South America. After the invasion of the Spanish conquerors it was imported to Europe, where it became known under the name of "Balsam of Peru". Its antiseptic properties and its vanilla-like scent quickly led to its increasing use in a wide variety of health-care and cosmetic products (1). The first reports about contact eczema from topically applied BP are from the end of the nineteenth century. Today, BP is known worldwide as being among the most frequent contact allergens (2–6).

Oral uptake of BP or individual components of BP such as cinnamic acid, vanillin or eugenol, which are used as aroma in food items and semiluxury food, can lead to systemic contact eczema in patients sensitive to BP. Diagnosis of this disease can be difficult, since many of the components of BP can be present as unrecognized, "hidden" allergens in different food items. Furthermore, the history and clinical presentation of systemic hypersensitivity against BP can differ from patient to patient. Thus, only after a very detailed, sometimes repeat, interview of the patient is the causal substance revealed. While patch testing and oral challenge are substantial for the diagnosis of systemic hypersensitivity against BP, therapy usually consists of comprehensive counselling about dietetic measurements. In presenting several patients with systemic hypersensitivity due to oral intake of BP, we illustrate the wide spectrum of this probably still often overlooked disorder.

CASE REPORTS

Patient 1

A 37-year-old woman who had suffered from dyshidrotic hand eczema for 9 years and in whom a previous patch test had shown positive reactions to BP and tinctura benzoes. Now, after eating chocolate, an acute rash with vesicles and some pustules developed on her neck, trunk and thighs. She had elevated temperature (38.3°C), and a blood count showed leucocytosis of 12.9/nl (neutrophils 72%, lymphocytes 11%, monocytes 5%, eosinophils 11%). In addition to topical and systemic corticosteroid therapy, a BP-reduced diet was initiated, resulting in complete clearance of the patient's symptoms. The patch test showed multiple contact allergic reactions, including BP, fragrance mix, propolis, cinnamic alcohol, eugenol and isoeugenol. Oral BP challenge resulted in the development of eczema on the face, neck, chest and upper back after another 24 h (Fig. 1).

Patient 2

A 72-year-old woman had suffered from recurrent dyshidrotic eczema of her hands, armpits and groins for 3 years. During the previous 5 months she had experienced several acute pruritic rashes with confluent erythematous papules spreading over her whole body. The patient had not noticed any possible causative agent. Following a BP-reduced diet and treatment with topical steroids she had complete clearing of the inflamed skin changes. A patch test was positive for BP. After another 2 h, oral BP challenge led to pruritic erythema on the trunk, and this continued to spread to the head and extremities.

Patient 3

A 53-year-old woman had suffered from atopic eczema from the age of 18, but since her 40th year had been essentially free of skin lesions. Three years ago she started a new job working in a flower shop and during the past 12 months she had experienced new episodes of eczema on her face, trunk and extremities which often appeared after handling conifer branches, applying different cosmetics or eating cinnamon cakes. Treatment with topical steroids led to clearance of the skin lesions. Patch testing showed contact allergic reactions to a variety of substances but not to BP. Because of the reactions to group allergens of BP (colophonium, fragrance mix), an oral BP challenge was performed, leading to severe pruritus and heat flush after 6 h, and eczema on the hands, arms, neck and upper chest.



Fig. 1. Acute dermatitis 24 h after oral Balsam of Peru challenge in patient 1.

DISCUSSION

BP is a viscous, dark brown to yellow-red substance. The complex resinous mixture contains at least 180 different components, some of them only in very small amounts (7). Because of the large variety of separate ingredients, a wide spectrum of possibly sensitizing substances exists, among them benzyl benzoate, coniferyl alcohol and benzoate, cinnamyl cinnamate, cinnamic acid and vanillin. Patients with BP contact allergy are often allergic to colophonium, balsam of Tolu, wood tar, turpentine, styrax or propolis, all of which can contain similar or related allergens (7).

For external application, BP can be found in a wide variety of drugs, remedies and health-care products. It is even contained in certain occupational substances, like mineral or cutting oils. BP is added as a natural flavour to many foods and semiluxury foods. In addition, aromatic substances in BP, or with BP cross-reactive epitopes, are found in the peel of citrus fruits or in different spices (5, 8). Allergic contact reactions to BP are usually observed either after external use of medical or health-care products and cosmetics or after occupational exposure to substances containing BP or some of its components; but allergic reactions can also be caused through contact with food items (1, 3, 5, 6).

As demonstrated here, skin reactions due to oral uptake of BP can present with variable clinical manifestations concerning the morphology and location of skin lesions as well as the course of their development. BP frequently appears as systemic contact dermatitis with dyshidrotic lesions of the hands or feet or as symmetrical dermatitis of the armpits and anogenital region (9, 10). Rarely, features of haemorrhagic vasculitis (usually on the legs) and systemic involvement (fever, leucocytosis, eosinophilia, nephritis) can be present (11, 12). Whether the elevated temperature and blood parameter changes in patient 1 were a result of her hypersensitivity to BP or a simultaneous cold is not clear. However, after oral challenge with BP only skin lesions were noted. Systemic BP hypersensitivity may result in anaphylactic reactions. Usually it presents as generalized urticaria, sometimes associated with angioedema (13). Furthermore, it should be noted that occasional systemic BP hypersensitivity can manifest itself only in localized or generalized pruritus, as initially seen in patient 3 after oral challenge with BP (14).

Owing to the highly variable clinical manifestations and the sometimes "hidden" source of BP exposure, systemic contact dermatitis due to oral intake of BP can often be overlooked. Diagnosis is based on patch testing and oral challenge with BP. Since patch testing can be negative for BP in patients hypersensitive to BP (as seen in our patient 3), oral challenge with BP is the gold standard for diagnosis of systemic BP hypersensitivity (9, 11, 14). One to two weeks before challenging, a BP-reduced diet should be initiated. Depending on

the type of systemic hypersensitivity, the patient might show immediate or delayed clinical symptoms.

The only effective therapy in patients with systemic BP hypersensitivity is consequent BP avoidance through a BP-reduced diet. However, the multitude of different components in BP and the high variety of cross-reacting and coupled allergens (5, 8), as well as the wide distribution of these substances, make successful avoidance difficult. Furthermore, the use of ingredients from BP as flavour in food items and semiluxury foods does not have to be declared explicitly, and might simply be summarized under the term "natural flavour". Long-term studies for up to 3 years have shown that with a BP-reduced diet about 50% of patients remain free of further hypersensitivity reactions (9, 15), underscoring the difficulty of achieving complete avoidance. The goal of therapeutic recommendation is thus to keep the amount of daily BP intake as low as possible.

REFERENCES

- Hjorth N. Eczematous allergy to balsams. *Acta Derm Venereol* 1961; 41 Suppl 46: 1–216.
- Schäfer T, Bohler E, Ruhdorfer S, Weigl L, Wessner D, Filipiak B, et al. Epidemiology of contact allergy in adults. *Allergy* 2001; 56: 1192–1196.
- Hausen B. Contact allergy to balsam of Peru. II. Patch test results in 102 patients with selected balsam of Peru constituents. *Am J Contact Dermat* 2001; 12: 93–102.
- Albert M, Gonzalez S, Gonzalez E. Patch testing reactions to a standard series in 608 patients tested from 1990 to 1997 at Massachusetts General Hospital. *Am J Contact Dermatitis* 2000; 9: 207–211.
- Olumide Y. Contact dermatitis in Nigeria (i). Hand dermatitis in woman. *Contact Dermatitis* 1987; 17: 85–88.
- Sertoli A, Francalanci S, Acciai M, Gola M. Epidemiological survey of contact dermatitis in Italy (1984–1993) by GIRDCA (Gruppo Italiano Ricerca Dermatiti da Contatto e Ambientali). *Am J Contact Dermatitis* 1999; 10: 18–30.
- Hausen B, Evers P, Stüwe H, König W, Wollenweber E. Propolis allergy (IV). Studies with further sensitizers from propolis and constituents common to propolis, polar buds and balsam of Peru. *Contact Dermatitis* 1992; 26: 34–44.
- Akker Tv, Roesyanto-Mahadi I, Toorenenbergen Av, Joost Tv. Contact allergy to spices. *Contact Dermatitis* 1990; 22: 267–272.
- Veien N, Hattel T, Justesen O, Norholm A. Reduction of intake of balsams in patients sensitive to balsam of Peru. *Contact Dermatitis* 1985; 3: 270–273.
- Veien N, Hattel T, Laurberg G. Can oral challenge with balsam of Peru predict possible benefit from a low-balsam diet? *Am J Contact Dermatitis* 1996; 7: 84–87.
- Klaschka F, Ring J. Systemically induced (haematogenous) contact eczema. *Sem Dermatol* 1990; 9: 210–215.
- Bruynzeel D, Hoogenband Hvd, Koedijk F. Purpuric vasculitis-like eruption in a patient sensitive to balsam of Peru. *Contact Dermatitis* 1984; 11: 207–209.
- Veien N, Hattel T, Justesen O, Norholm A. Oral challenge with balsam of Peru. *Contact Dermatitis* 1985; 12: 104–107.
- Veien N, Hattel T, Justesen O, Norholm A. Diagnostic procedures for eczema patients. *Contact Dermatitis* 1987; 17: 35–40.
- Salam T, Fowler J. Balsam-related systemic contact dermatitis. *J Am Acad Dermatol* 2001; 45: 470–471.