

Severe contact urticaria to guar gum included as gelling agent in a local anaesthetic

ALEXANDER ROESCH¹, TILL HAEGELE², THOMAS VOGT¹, PHILIPP BABILAS¹, MICHAEL LANDTHALER¹ AND ROLF-MARKUS SZEIMIES¹

¹Department of Dermatology, University of Regensburg, Franz-Josef Strauss-Allee 11, D-93053 Regensburg, and

²Botanical Garden Munich, D-80638 Munich, Germany

We report the first case of a life-threatening immediate-type hypersensitivity caused by DynexanTM, a local anaesthetic gel. After mucosal application by his dentist, a 63-year-old man rapidly developed urticaria, dyspnea and, at last, he collapsed and remained unconscious for 2 hr despite emergency care. While the standard prick tests were negative to all local anaesthetics tested including lidocaine, a 1-fold positive reaction was detected to Meyprogat 60TM, an ingredient of DynexanTM. As the gelling agent Meyprogat 60TM represents a derivative of guar (synonymous guar gum, guaran, E-412), we subsequently tested different guar products derived from *Cyamopsis tetragonoloba* beans and, as control, the closely related locust bean gum E-410. In the prick-to-prick tests, the guar-derived food additive ProvigelTM NAG 905 provoked a 1-fold positive reaction. Native guar beans pounded and resuspended in water showed a 2-fold positive reaction, whereas no reaction was found to derivatives of locust bean gum. Specific immunoglobulin E were negative in all cases. Despite the common use of guar as versatile food additive or gelling agent, this is the first case of a severe immediate-type hypersensitivity after mucosal contact.

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For severe immediate-type hypersensitivity reactions comprising urticaria, hypotension or shock, drugs have become the most frequent cause followed by insect stings and foods (1). In contrast to beta-lactam antibiotics (2, 3), true systemic reactions to topical application of local anaesthetics, such as lidocaine, are documented, but remain rather rarely (4).

Patient

We report on a 63-year-old man without any known allergies who developed general urticaria with pruritus 5 min after topical administration of a lidocaine gel (DynexanTM; Kreussler, Wiesbaden, Germany) by his dentist. Thereafter, he massively sweated, suffered from dyspnea and rapidly collapsed. Despite immediate systemic administration of antihistaminics, corticosteroids and epinephrine, he remained unconscious for 2 hr. Intermediately, he was transferred to a local emergency care unit where he was monitored for 2 days.

Methods and Results

During the first consultation in our department, we performed a standardized prick test with different types of local anaesthetics and common preservatives. Neither to the tested drugs lidocaine 1.0%, bupivacaine 0.5%, mepivacaine 2.0%, articaine 2.0%, prilocaine 1.0% and novocaine 1.0% nor to the preservatives chlorbutanol 0.4%, methyl-4-hydroxybenzoate 0.1% and sodium disulfite 0.2%, a positive reaction was observed. In addition, latex was pricked to rule out latex allergy. However, in the prick-to-prick test with the original lidocaine gel (DynexanTM), a 2-fold positive reaction was found. In a second attempt, we pricked all 12 ingredients of the dental gel kindly supplied by the manufacturer (Kreussler, Wiesbaden, Germany). Interestingly, again no reaction was found to lidocaine, but instead, a clear positive reaction could be documented to the gelling agent Meyprogat 60TM. As Meyprogat 60TM represents a derivative of guar (synonymous guar gum, guaran, E-412), in a third attempt we tested different guar products derived from *Cyamopsis tetragonoloba* beans and, as

control, the closely related locust bean gum E-410 derived from *Ceratonia siliqua*. In the prick-to-prick test, the guar-derived food additive ProvigelTM NAG 905 (Provisco AG, Hauptwil, Switzerland) provoked a 1-fold positive reaction. Native guar beans pounded and resuspended in water even showed a 2-fold positive reaction. In contrast, highly purified molecular grade locust bean gum (Sigma, Deisenhofen, Germany) as well as ProvigelTM NAC 25 (Provisco AG), a locust bean gum-derived food additive, failed to show any positive reaction.

Total serum immunoglobulin E (IgE) was 99.0 kU/l. Mast cell tryptase was normal. Interestingly, specific IgE (ImmunoCAP; Pharmacia, Uppsala, Sweden) were negative to both locust bean gum and guar gum as well as to the controls green pea, white bean and mushroom.

Discussion

Guar gum and locust bean gum are very commonly used by the food industry as versatile additives or by the pharmaceutical industry as gelling agent. Guar is industrially obtained from the endosperm of the leguminous plant *C. tetragonoloba* and represents an omnium gatherum of different molecules. With 80%, the major component is galactomannan, a hydrocolloid polysaccharide consisting of a 1,4-beta-D-mannopyranose backbone with branchpoints linked to alpha-D-galactose. Next to this complex polymer, water (12%), proteins and amino acids (5%) as well as lipids and fatty acids (1.5%) represent further components (5).

As side-effects to guar, mainly gastrointestinal complaints, such as nausea, stomachache or meteorism, have been reported (5). In the field of allergy, mostly cases of rhino-conjunctival or asthmatic symptoms after airborne exposure have been documented in literature (6–8).

In conclusion, to the best of our knowledge, we report the first case of a life-threatening, immediate-type reaction after mucosal contact to a guar derivative. While the prick tests were positive to

completely grinded native guar beans and the industrially purified food additive ProvigelTM NAG 905, guar-specific IgE were negative, comparable with high false-negative rates described in other allergies, such as peanut allergy (9). A possible explanation for this discrepancy can be the varying degree of allergen contamination in different guar products, remaining from the germ or hull of the *Cyamopsis* bean, which are not detected by commercial IgE assays probably established with highly purified guar gum.

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Address:

Rolf-Markus Szeimies, MD, PhD

Department of Dermatology

University of Regensburg

Franz-Josef Strauss-Allee 11

D-93053 Regensburg

Germany

e-mail: rolf-markus.szeimies@klinik.uni-regensburg.de