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LETTER TO THE EDITOR

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Type I hypersensitivity elicited by an electrolytic solution containing 5% maltose

Dear Editor

Electrolytic solutions containing sugar are widely used in clinical settings, and allergic reactions are very rare. We report a case of an allergic reaction elicited by the injection of an electrolytic solution containing 5% maltose.

A 44-year-old woman underwent surgery for myoma uteri and a left ovarian chocolate cyst. During anesthesia induction, hives and throat discomfort appeared several minutes after intravenous injection of electrolytic solution containing 5% maltose (Potacol R®, Otsuka), thiamine hydrochloride, and ascorbic acid. Prick tests for these three injection drugs were negative. We therefore performed diagnostic challenges with each of these injection drugs. Thiamine hydrochloride and ascorbic acid produced no reactions. Challenge with Potacol R® (150 mL/h) elicited wheals on her abdomen, arms, and right thigh 60 minutes after the start of the injection (Figure 1A). The cutaneous lesions resolved within 90 minutes. Potacol R® contains 5% maltose, 0.6% sodium chloride, 0.31% sodium lactate, 0.03% potassium chloride, and 0.02% calcium chloride. Prick tests for the individual components were negative, and only an intradermal test for maltose was positive. A total of four healthy subjects showed a negative reaction to maltose intradermal test. Medical gloves were used during the surgery and allergy skin tests, but no allergic reactions appeared except for an intradermal test for maltose. We exclude latex allergy and attribute her urticaria to maltose.

Electrolytic solutions containing 5% maltose are widely used infusion fluids. Allergic reactions were rarely reported, and most were type I hypersensitivity.[1–3] Wheals developed on the challenge test with this solution in our patient. Intradermal test with maltose was positive, indicating that elicitation of her type I hypersensitivity was attributable to maltose.

Maltose, one of the disaccharides, is present in various diets. Carbohydrates, common food ingredients, are converted into maltose and/or other small glucose polymers before passing beyond the duodenum or upper jejunum.[4] However, allergy to dietary maltose has not been reported in the literature. As our patient had no history of food allergy, maltose would not induce allergic reactions in the gut mucosa. Her allergic reaction to injected maltose might be related to the sugar metabolism. All maltose molecules are split into glucose, which has no antigenicity, in the intestine before their absorption into the peripheral circulation.

Our case indicates that the same component exhibits different antigenic activity depending on the route of administration.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

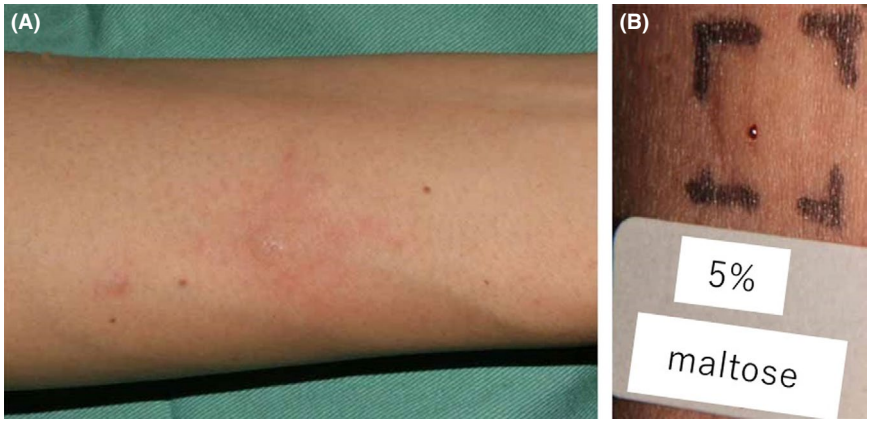

FIGURE 1 A, A challenge test with an electrolytic solution containing 5% maltose produced a wheal on her arm. B, The intradermal test elicited a positive reaction to maltose

Mitsuhiro Hisadome MD, PhD[1]
Yuko Higashi MD, PhD[1]
Kentaro Yonekura MD, PhD[1,2]
Kazuhiro Kawai MD, PhD[1]
Takuro Kanekura MD, PhD[1]

[1]*Department of Dermatology, Kagoshima University Graduate School of Medical and Dental Sciences, Kagoshima, Japan*
[2]*Department of Dermatology, Imamura Bun-in Hospital, Kagoshima, Japan*

Correspondence
Mitsuhiro Hisadome, Department of Dermatology, Kagoshima University Graduate School of Medical and Dental Sciences, 8-35-1 Sakuragaoka, Kagoshima 890-8520, Japan
Email: k1628251@kadai.jp

ORCID

Mitsuhiro Hisadome https://orcid.org/0000-0002-4408-8855
Kazuhiro Kawai https://orcid.org/0000-0001-9375-0713
Takuro Kanekura https://orcid.org/0000-0003-3904-5954

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