

Effect of freezing foods for the outcome of skin prick tests

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Key words: cow's milk; food allergy; hen's egg; skin prick test.

Food allergy is a common allergic disorder, especially in childhood. Cow's milk (CM) and hen's egg (HE) are the most common foods with allergic potential in this age group

Freezing aliquots of CM and HE represents a practical procedure for skin prick testing

(1). Diagnosis of food allergy includes the determination of specific IgE in serum or the skin prick test (SPT). The SPT is sometimes preferred as it is easy to perform, rapid and inexpensive (2).

While the SPT is usually performed with either fresh, native foods or with commercial extracts, comparisons have revealed that tests with fresh food are superior in terms of sensitivity and specificity (3). However, it is often inconvenient to keep fresh foods at hand for whenever an SPT is required. Freezing small aliquots of fresh foods to be defrosted directly before performing the SPT would be much easier (4).

We therefore compared the reliability of SPTs with two different freezing and defrosting protocols for CM and HE with the usual procedure of taking fresh food every time.

The study group comprised 32 children (17 boys, 15 girls) with a mean age of 39.4 months (ranging from 7 months to 16.3 years). Patients were recruited from children admitted to our ward for the diagnostic work-up of suspected food allergy. All children suffered from atopic dermatitis with proof of IgE-sensitization to CM and/or HE.

Of the 32 children, 20 patients underwent the SPT with CM, and 20 with HE. Three types of CM and/or HE were tested in every patient, namely fresh food (test material A), the food frozen once at -20°C and defrosted at room temperature on the day of the SPT (test material B), and the food frozen and defrosted five times on five different days before use for the SPT (test material C).

The SPT was performed by applying one drop each of test materials A, B, and C from CM and HE to the patient's forearm. Skin prick test was performed with 1 mm single-peak lancets (ALK-Scherax, Hamburg, Germany). As a positive control we used 10 mg/ml histamine dihydrochloride (ALK-Scherax), with saline solution as a negative control. Results were read after 15 min. No child got any antihistamine within 72 h before the SPT.

Mean diameters of food allergen wheals were calculated as half the sum of the largest measurement across the wheal and the largest wheal measurement at right-angles to this. In addition, we calculated the skin index as the mean allergen wheal diameter divided by the mean histamine wheal diameter. The SPT result for each allergen was defined as positive if the mean wheal diameter was 3 mm or larger and the skin index was greater than 0.6.

Results are shown in Table 1. Fresh CM and HE, foods frozen once, and foods frozen five times showed some variation of wheal diameters as well as in the skin indices. Around ten patients showed variations to a larger extent between the three test materials. However, there was no clear trend towards smaller wheals in the two groups using the freezing procedures. Other patients remained extremely stable in their wheal diameters with all test conditions.

Skin prick tests vary considerably between investigating personnel (5). In our study, tests were all performed by the same person (MZ). Nevertheless, there were considerable variations in wheal diameters

within a patient. However, only in one child (no. 11) did this lead to a negative result (< 3 mm wheal diameter) in any of the three conditions of the SPT procedure. It is important to minimize false negative results to avoid the risk of missing the sensitization to the relevant food.

Not only do fresh foods seem to be superior to commercial extracts for skin prick tests, as mentioned above, they also offer the added advantage that the same material can be used for SPT and oral food challenges.

Our results for CM and HE cannot be transferred automatically to other common foods such as wheat or soy. Studies of a similar design are warranted if further foods are intended to be used for the SPT after freezing.

In conclusion, our findings indicate that freezing CM or HE at -20°C does not alter the allergenic character of these foods. Freezing aliquots of CM and HE represents a practical measure to facilitate skin prick testing.

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Table 1. SPT data of patients

No	ID	CAP (Class)	HE (A) (mm)	HE (B) (mm)	HE (C) (mm)	CAP (Class)	CM (A) (mm)	CM (B) (mm)	CM (C) (mm)
1	FB	2	18 × 9 (6.5)	17 × 7 (4.8)	16 × 9 (5.8)	2			
2	OA	2	9 × 9 (4.1)	10 × 7 (3.5)	9 × 7 (3.2)	0			
3	BT	0	13 × 7 (3.0)	11 × 5 (1.8)	11 × 5 (1.8)	0			
4	BM	3	40 × 10 (16.0)	10 × 10 (4.0)	6 × 6 (1.4)	1			
5	HN	5	11 × 5 (4.6)	12 × 5 (7.4)	14 × 6 (7.0)	5			
6	LJ	2	15 × 20 (6.1)	18 × 20 (7.4)	12 × 14 (3.4)	0			
7	HF	2	16 × 8 (4.3)	13 × 5 (2.2)	10 × 5 (1.7)	0			
8	GL	2	10 × 10 (4.0)	10 × 10 (4.0)	10 × 10 (4.0)	0			
9	AM	2	17 × 10 (8.5)	20 × 11 (11.0)	25 × 9 (11.3)	0			
10	RD	3	7 × 7 (3.1)	7 × 7 (3.1)	7 × 7 (3.1)	2			
11	GA	2	2 × 2 (0.4)	4 × 4 (1.8)	5 × 5 (2.8)	0			
12	BO	2	3 × 3 (0.6)	3 × 3 (0.6)	3 × 3 (0.6)	0			
13	GE	2	10 × 5 (2.0)	10 × 7 (2.8)	4 × 8 (1.3)	2	9 × 6 (2.2)	13 × 10 (5.2)	10 × 10 (4.0)
14	KP	0	4 × 5 (0.8)	5 × 5 (1.0)	5 × 5 (1.0)	6	10 × 10 (4.0)	10 × 9 (3.6)	8 × 9 (2.9)
15	DF	2	5 × 4 (1.7)	4 × 4 (1.3)	4 × 3 (1.0)	1	6 × 5 (2.5)	6 × 7 (3.5)	8 × 7 (4.7)
16	KA	2	17 × 18 (8.5)	12 × 7 (2.3)	12 × 10 (3.3)	3	19 × 9 (4.8)	20 × 13 (7.2)	9 × 11 (2.8)
17	TA	2	12 × 9 (5.4)	20 × 7 (7.0)	17 × 4 (3.4)	1	5 × 4 (1.0)	4 × 4 (0.9)	4 × 3 (0.8)
18	BJ	2	20 × 10 (3.6)	12 × 15 (3.2)	15 × 12 (3.2)	2	7 × 6 (0.8)	12 × 10 (2.1)	10 × 10 (1.8)
19	SA	2	7 × 5 (1.0)	6 × 8 (1.3)	12 × 6 (2.0)	1	5 × 5 (0.7)	6 × 6 (1.0)	6 × 9 (1.5)
20	ML	4	12 × 10 (4.8)	12 × 8 (3.8)	12 × 7 (3.4)	2	11 × 6 (2.6)	8 × 5 (1.6)	5 × 5 (1.0)
21	SJ	3				3	12 × 5 (3.0)	7 × 3 (0.9)	5 × 5 (1.0)
22	SK	2				2	10 × 6 (2.4)	6 × 3 (0.7)	4 × 4 (0.6)
23	BM	2				2	10 × 6 (3.8)	12 × 6 (4.5)	10 × 6 (3.8)
24	KT	0				1	5 × 5 (2.8)	8 × 6 (5.3)	6 × 5 (3.3)
25	SF	0				2	10 × 10 (0.6)	12 × 14 (1.0)	10 × 10 (0.6)
26	EC	0				3	4 × 4 (1.8)	5 × 4 (2.2)	4 × 4 (1.8)
27	SJ	3				4	6 × 3 (2.0)	11 × 3 (3.7)	11 × 4 (4.9)
28	RJ	0				3	11 × 11 (4.8)	7 × 7 (2.0)	6 × 6 (1.4)
29	HC	3				3	17 × 7 (7.4)	20 × 8 (10.0)	10 × 10 (6.2)
30	HP	1				5	15 × 9 (3.8)	11 × 10 (3.1)	12 × 7 (2.3)
31	EB	n.d.				n.d.	8 × 8 (2.6)	8 × 8 (2.6)	7 × 7 (2.0)
32	HL	2				5	11 × 4 (2.8)	11 × 3 (2.1)	6 × 6 (2.3)

Skin indices in parentheses; n.d. = not determined.

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A case of urticaria induced by both hydroxyzine and cetirizine but not by levocetirizine

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Key words: cetirizine; drug hypersensitivity; levocetirizine; urticaria.

Cetirizine, the carboxylated metabolite of hydroxyzine, is racemate mixture composed of equal amounts of two enantiomers, levocetirizine (R-cetirizine) and

dextrocetirizine (S-cetirizine) (1, 2). Because antihistamines are the main tool for symptomatic treatment of urticaria, urticarial reaction to antihistamines may lead to errors in diagnosis and treatment. We report a case of generalized urticaria induced by both cetirizine and hydroxyzine, but not by levocetirizine enantiomer, which was confirmed by single-blind placebo-controlled challenge tests.

Challenge test with levocetirizine was negative in a patient showing urticaria to hydroxyzine and cetirizine.