

DELAYED BLANCH PHENOMENON IN CHILDREN: REEVALUATION OF 5-YEAR-OLD CHILDREN ORIGINALLY TESTED AS NEWBORNS*

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ABSTRACT

A follow-up study involving 50 children (who were 5 years old) from an original group of 100 who had been tested as newborns was carried out using the delayed blanch phenomenon. The reaction persisted in 78%. No correlation could be found between personal and family history of allergy and the presence or absence of the delayed blanch phenomenon.

The delayed blanch phenomenon, first described by Lobitz and Campbell in 1953 (1), consists of an unusual paradoxical blanch at the site of the wheal after the intracutaneous injection of methacholine. The normal reaction consists of the erythema of vasodilatation, wheal and flare, and subsides after 30 to 40 minutes. In those who have the delayed blanch phenomenon, a pallor appears within the flare after a delay of 3 to 5 minutes. The delayed blanch reaction was found by Reed and Kierland (2) in 90% of patients with atopic dermatitis and by West and associates (3) in 50% of patients with allergic disease but without skin manifestations.

In 1966, Hinrichs and associates (4) reported having tested 100 consecutive newborn infants by the intracutaneous injection of methacholine. These authors proposed a possible relationship between the delayed blanch in newborns and the occurrence of allergic disease when these infants became older. The present study is a result of follow-up of the 100 children, now that they have reached 5 years of age.

MATERIALS AND METHODS

We restudied 50 of the original 100 infants who were tested at birth. As far as could be determined, the only hindrance to follow-up was the family's moving to an unknown location.

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This study adhered closely to the methods used by Hinrichs and associates (4) with this same group during the newborn period. The parent was interviewed regarding the personal history of the patient. Family history was again reviewed and brought up to date. A physical examination was performed, with a special search for evidence of allergic disease. The children were retested as in the previous work. This consisted of a test solution of methacholine (1:1,000) and control solutions of histamine (1:100,000) and 0.9% saline. Attempts at producing injection wheals of 3 mm in diameter in the epidermis were made. This required the use of 0.05 to 0.1 ml test material. The area of blanch was graded positive when it measured 8 mm or larger in diameter.

The personal history was graded major if the patient had had hay fever, asthma, or significant eczema or urticaria since birth and minor if he had had secretory otitis, a brief bout of eczema, a single bout of asthmatic bronchitis, or a drug allergy. Urticaria was regarded as minor if there was a single, brief episode.

The family history for allergy was graded as 1+ when major allergy was present in one parent, grandparent, or sibling. A 2+ grade was given if two or more family members had a history of major allergy. The history was graded minor when it included insect allergy or food allergies or when major allergies occurred in more distant relatives. It was graded 0 when there was no evidence of allergic disease. In many instances, the previous family history when reviewed again needed to be upgraded for the current study.

RESULTS

Of the original 100, 50 (30 boys and 20 girls) were retested. Blanching did not occur with either histamine or saline during testing. All those tested with histamine had the expected wheal and flare reaction. Saline resulted in a smaller wheal and flare, and this usually disappeared within 20 minutes. The children

who had a positive delayed blanch when tested with methacholine at birth tended to have a positive reaction at 5 years of age; there were 18 of 23 (78%) (Table I). Those with a previously negative reaction were likely to again have a negative reaction, that is 23 of 27 (85%). It is notable that 5 of the 23 (22%) who had a previously positive reaction had a negative reaction at 5 years of age, and 4 of the 27 (15%) who previously had no reaction had a delayed blanch when tested at 5 years of age.

There were 22 of the 50 children who had positive delayed blanch at 5 years. However, only 2 of the 22 (9%) had evidence of major allergic disease (Table I), and 3 (14%) had evidence of minor allergic disease. Twenty-eight of the 50 children had no reaction. Three of the 28 (11%) had major allergic disease, and 4 (14%) had minor allergic disease.

Nineteen of the 22 children (86%) who had positive delayed blanch at 5 years of age had a positive family history for allergy. However, 21 of the 26 (81%) who had negative reactions also had positive family history for allergy. No correlation was found between family history of allergy and the results of testing.

DISCUSSION

In their study, Hinrichs and associates (4) posed several questions. The present data provide some answers. The delayed blanch does occur in newborn infants and tends to persist up to 5 years of age. There is no correlation between the occurrence of allergic disease in those with delayed blanch in either the newborn period at 5 years of age. A positive family history for allergic disease was noted in about the same percentage of those with the delayed blanch (86%) as those with negative reactions (81%). The delayed blanch phenomenon in the newborn infant does not seem to be a valid prognostic test for allergy.

This group of children had an inordinately large number of positive family histories for allergic disease. The explanation for this is not apparent.

It is notable in the group of children whom we tested there was only one with chronic

TABLE I

Relationship of delayed blanch phenomenon at birth and at 5 years of age to clinical manifestations of allergy

Personal history of allergy	Delayed blanch phenomenon (50 patients)			
	Positive at birth (23 patients)		Negative at birth (27 patients)	
	Positive at 5 years	Negative at 5 years	Positive at 5 years	Negative at 5 years
None	15	5	2	16
Minor	2	0	1	4
Major	1	0	1	3
Total	18	5	4	23

atopic dermatitis, and he had the delayed blanch. The delayed blanch phenomenon has been noted by others (2, 5, 6) in most patients with atopic dermatitis. This phenomenon has been found more frequently in adults who have allergic disease without atopic dermatitis than in those who are normal (3). A retest of the children in the present study at intervals throughout childhood and adulthood may give better correlation of the delayed blanch with allergic disease as they grow older.

The delayed blanch has been described as one of the manifestations of altered vascular reactivity that is observed in atopic persons (7). White dermographism, heightened vasoconstriction to a cold environment, and increased nasal vascular responses may occur to stimuli that produce no change in the normal. The person with this heightened vasoactive state may not manifest allergic disease, but the common occurrence of these two states simultaneously may represent a genetic relationship.

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