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HISTAMINE IN PLASMA IN THE INDUCED URTICARIA DUE TO COLD

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In many investigations on urticaria due to cold (1, 2, 3, 4, 5, 6), the pathogenesis of this manifestation was particularly examined, particularly the question of the allergic nature of this reaction. In some of these studies (7, 8, 9, 10), indirect proofs about the role of histamine in the development of this urticaria were explored. In order to examine the role of histamine, we determined the level of histamine in plasma in induced urticaria in such patients.

MATERIALS AND METHODS

The level of histamine in plasma was determined in induced urticaria in 7 patients, who were proved to have urticaria due to cold. The urticaria was provoked by washing the patients with cold water ($+10^{\circ}\text{C}$) until the appearance of the symptoms (usually about 3-5 minutes after the beginning of the wash). The blood samples were taken by a syringe washed with heparine, immediately before exposing the patient to cold, and 10-12 minutes later, immediately after the urticaria had developed. The histamine level was assayed biologically, by Code's classical method (11).

RESULTS

Detailed results are presented in the Table 1. In some of these cases the histamine level was also determined 30 minutes later, but no significant changes were found.

Cases No. 1 and No. 2 reacted to exposure to cold only by

local reactions, so that wheals appeared only at directly exposed places, while the other patients always reacted with generalized urticaria, so that wheals appeared all over the body, even in places which were not directly exposed. In all these cases, if prior to the exposure the patients were administered bigger doses of antihistamines (2 ampulles of Synopene¹), the appearance of urticaria was prevented or considerably arrested. However, in a single case (No. 6), even small doses of antihistamines ($\frac{1}{2}$ tablet of Synopene²) completely prevented the development of the reaction after the exposure to cold.

TABLE I
Histamine level in plasma in $\mu\text{g/liter}$.

Number of patient	immediately before exposure to cold	10-12 minutes after the beginning of exposure
1	42	36
2	36	107
3	33	32
4	48	47
5	43	58
6	61	1028
7	40	42

The marked increase of the level of histamine in plasma was found only in one of the patients, the one who did not develop urticaria even after taking the small doses of antihistamines. However, no difference was found between the level of histamine in plasma of patients who reacted only by localized urticaria after exposure to cold (patients Nos. 1 and 2), and those reacting by generalized urticaria.

DISCUSSION

According to these results it cannot be said that the increase of the histamine level in plasma plays a decisive role in the

¹ One ampulla has 2 ml 1 % Synopene solution = 0.02 gr.

² One tablet has 0.025 gr. of Synopene.

development of the skin changes in urticaria due to cold. However, that does not exclude the possibility of a temporary increase of level of histamine in plasma, or of a localized increase of concentration of histamine in tissues during this allergic reaction.

In some of these patients intradermal injections of histamine releasers (0.1 ml 0.008 % 1935L) were given (12). It is interesting to note that if they were injected in the areas of skin where the local skin reaction to cold was previously exhausted by repeated exposures to cold, the usual change on the skin—the wheal—could not be obtained. However, the expected reaction—the wheal—did not develop even after intradermal injections of the histamine itself (0.1 ml 0.01–0.001 % histamine phosphate) in these areas of the skin. It would seem that it is not so much the exhaustion of histamine in the skin, but more probably a decrease of the sensitivity of receptors to histamine or maybe of the ability of vasomotors to react.

SUMMARY

The role of histamine in the development of urticaria due to cold was examined. The level of histamine in plasma was determined in seven patients immediately before intentional exposure to cold, and 10–12 minutes later, immediately after the urticaria had developed. A marked increase in the level of histamine in plasma was found only in one of the patients. It was concluded that immediately after the moment when the wheals in urticaria due to cold had appeared, the increase of the level of histamine in plasma in the majority of such patients did not play a decisive role.

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