

Variability in Distribution of Allergic Skin Response.

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Allergy is used here in the meaning of human hypersensitiveness, clinical expressions of which are bronchial asthma, hay fever and urticaria. In these conditions, the most important diagnostic procedure is the skin test. Measured amounts of the foreign substance (allergen) to which an individual is suspected of being allergic, are injected into the superficial cells of the skin. A positive skin reaction represents the effect of contact between the injected allergen and a reacting substance, presumably an antibody, in the skin cells. The result of this contact is the elaboration of some stimulus that causes a local capillary permeability with consequent wheal formation.

It was observed, occasionally, that individuals who gave pronounced positive skin reactions at one time would give smaller or no reactions subsequently, and other individuals giving no skin response would occasionally develop a positive reaction at a later time. These patients had received no specific treatment and the technical features of the tests were kept constant. This variability was studied and forms the subject of this investigation.

It was found that when a given amount of allergen (0.02 cc.) is injected successively at various sites in the skin, there is a marked variation in the size of the resulting wheals. (Figs. 1 and 2.) For instance, the response on the back may be 2 or 3 times larger than that on the leg. There is no constant anatomical factor, although reactions on the back and abdomen tend to be larger than elsewhere.

These variations may be explained in one of 2 ways: (a) either throughout the skin cells, there is an uneven distribution of antibody to react with the constant amount of allergen injected at the various sites; or, (b) the capillary response which results from the reaction between allergen and antibody is not a uniform one.

Advantage was taken of the fact that histamin is known to produce wheals in dogs, similar histologically to those of human urticarial wheals. Consequently, 0.02 cc. of a 1 to 1000 histamin solution was injected into the skin of the abdomen, thigh and ear of dogs. The resulting capillary response was very uneven (Fig. 3). Here, there is no question of immune bodies.

From the analogy of the above reactions to histamin, it is conceivable that the variations in allergic wheal formation in human skin are due to lack of uniform response on the part of the skin cap-

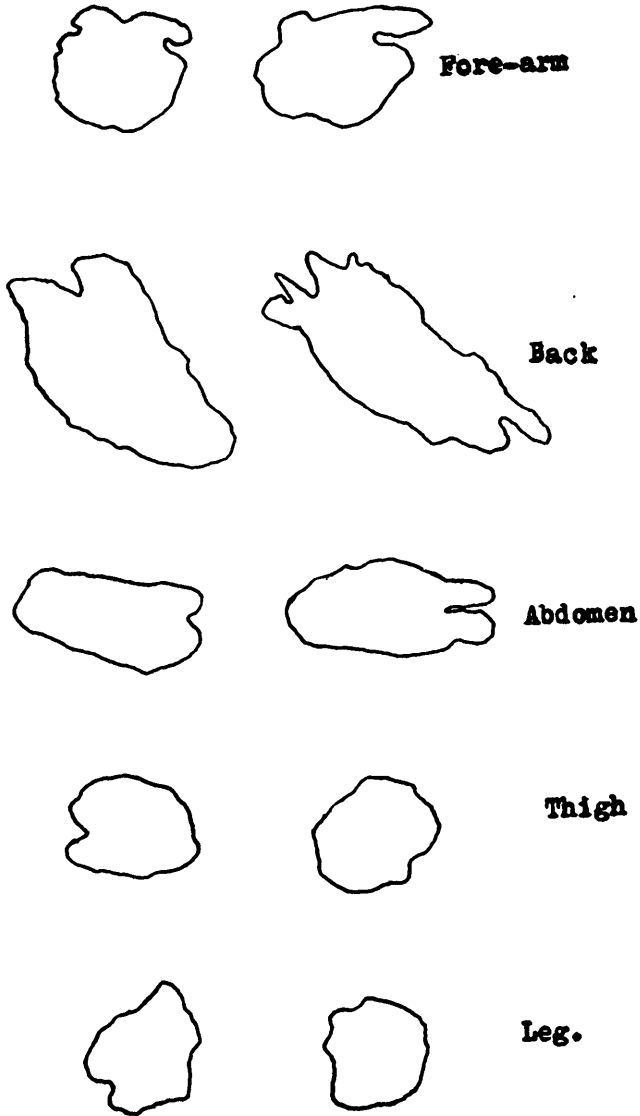


FIG. 1.

0.02 cc. of a 1 to 10,000 ragweed pollen extract injected into various sites of the skin of a hayfever patient.

illaries to the same stimulus, rather than to an uneven distribution of antibodies in the skin cells. These results suggest an explanation of the clinical phenomenon that urticaria, which is usually an aller-

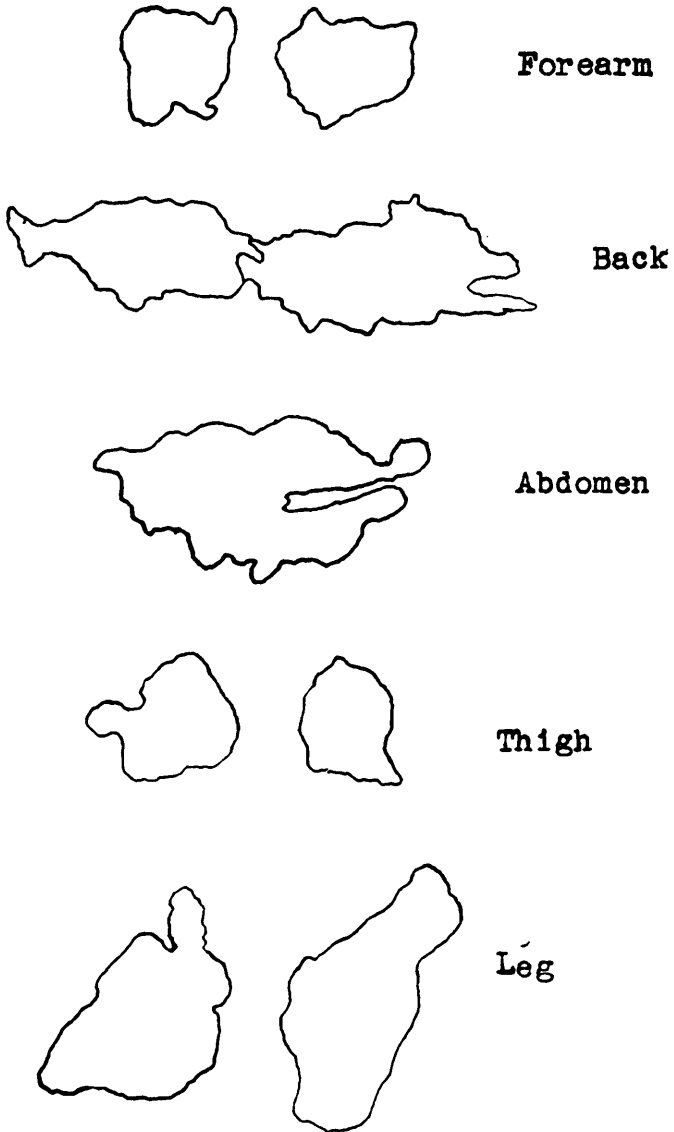


FIG. 2.

0.02 cc. of a 1 to 1,000 timothy pollen extract injected into various sites of the skin of a hayfever patient.

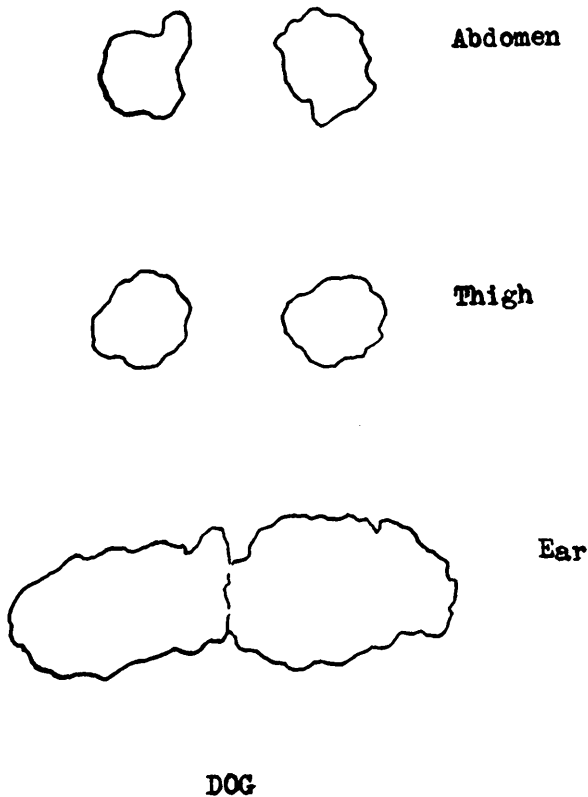


FIG. 3.

0.02 cc. of a 1 to 1,000 histamin solution injected into various sites of the skin of a dog.

gic manifestation, occurs as wheals of varying size, irregularly distributed throughout the skin.

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Observations on the Circulation of Guinea Pigs During Bronchospasm.

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The purpose of this experiment is to study the effect of bronchospasm on the circulation with reference to filling of the right heart.

Since anaphylactic shock in guinea pigs is manifested by bronchospasm, these animals were chosen.