

HISTOCHEMICAL STUDIES IN ATOPIC DERMATITIS: RESPONSES FOLLOWING CONTROLLED STRIP INJURY*

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In previous studies we have shown that the epidermis of normal human skin will produce histochemical changes when the skin is injured (1, 2, 3, 4). One of these injuries was the well-established technic of removing the stratum corneum with an adhesive tape. For this study we applied this technic to the lichenified and normal skin of patients with atopic dermatitis.

The stratum corneum was removed with cellophane adhesive tape from the lichenified atopic dermatitis of the popliteal area and from the non-lichenified, normal-appearing skin of the adjacent flexural thigh of the same patient. With an electric-driven, 5 mm diameter, high-speed, rotary punch, two biopsy specimens were removed from each of these injured areas before the injury and 4, 18, and 24 hours after the injury. As an additional control, the normal skin of the popliteal area of a person who does not have atopic dermatitis was removed for biopsy. Specimens were examined for mitotic activity in the epidermis and for histochemically demonstrable glycogen (5), phosphorylase (6), glucose-6-phosphatase (7), succinic dehydrogenase (8) and cytochrome oxidase (9). The comparative results are recorded in table 1 through 6.

RESULTS

Glycogen and Mitotic Activity

The glycogen response and mitotic activity in the non-lichenified skin of the atopic patient followed the same pattern as previously described for normal human skin (3). Glycogen ap-

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This investigation was supported (in part) by the U. S. Army Research and Development Command under contract DA-49-193-MD-2184; by a PHS training grant, 2A-5300, from the National Institute of Arthritis and Metabolic Diseases, Public Health Service; and by a PHS research grant, E-3102 (C2), National Institute of Allergy and Infectious Diseases, Public Health Service.

Received for publication July 11, 1963.

peared in the stratum basale of the epidermis 18 hours after the injury. Mitotic activity in the stratum basale began to increase slowly 18 hours after the injury (Table 1). The lichenified skin of the atopic patient was different. Glycogen was seen mainly in the stratum spinosum of the epidermis before the injury. It was then definitely decreased 4 hours after the injury, but at 18 hours there was a sharp increase in both the stratum basale and in the stratum spinosum. Twenty-four hours after the injury a sudden decrease in the glycogen content of all the epidermal cells was observed. The mitotic activity which was seen in the stratum basale before the injury showed a slight increase afterwards (Table 2).

Phosphorylase

There was no significant difference between the phosphorylase activity of lichenified and non-lichenified skin of the atopic patient. The injury did not alter the activity in any instance (Table 3).

Glucose-6-phosphatase

In the normal popliteal skin there was a moderate degree of glucose-6-phosphatase activity in the stratum basale, spinosum and granulosum. A similar distribution of the enzyme was seen before injury in the lichenified and non-lichenified skin of the atopic patient. The stratum granulosum had a little more activity than normal but of questionable importance. After the injury there was a slight increase in the activity of the enzyme in the stratum basale of lichenified skin. Activity also appeared after the injury in the stratum corneum in both specimens taken from the atopic person.

Succinic dehydrogenase

The activity of succinic dehydrogenase was decreased in the lichenified skin after injury. This was especially prominent in the outer stratum spinosum and in the stratum granulosum (Table 5).

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