

CELLULAR CHANGES IN THE PSORIATIC EPIDERMIS

X. Microplanimetric Studies on Epidermal Cell Size during Treatment

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Abstract. Results of microplanimetric measurements of cells in the pronounced macrocytic psoriatic epidermis during treatment with flubenisolone 17 α -valerate are reported. The size of cytoplasm, nucleus and nucleolus has been estimated weekly in biopsies until complete regression. No significant differences in the ratios nucleus/cytoplasm and nucleolus/nucleus could be demonstrated. When the lesions are clinically healed, the epidermal cells are still slightly enlarged.

Key words: Psoriasis; Microplanimetric measurements; Cellular areas

The characteristic triplicity of histopathological changes in the well established, typical psoriatic lesion, namely the parakeratosis, the acanthosis and the microabscesses of Munro-Sabouraud, is well known (cf 7, 10). Extensive analyses of the submicroscopic structural organization (2, 6, 8, 11) reveal a characteristic cytoplasmic abundance of cell organelles, a poorly developed tonofilament system, a paucity of desmosomes and absence of, or considerable reduction of keratohyalin. The pattern of the psoriatic epithelium also has a pronounced macrocytic character, demonstrating greatly enlarged cells, nuclei and nucleoli. Many authors have studied the effect which various antipsoriatic remedies have on the pathological changes occurring during treatment and regression (1, 4, 5, 9). Certain modes of action of the psoriatic lesions have been proposed, based on observed alterations in the submicroscopic organization. When the psoriatic epidermis gradually reverts to a normal appearance, it also loses its macrocytic character. The interrelation in size between cytoplasm and nucleus-nucleolus during this process has not been clarified. As a knowledge of these conditions is most important for a reliable comparison of quantitative estimations of subcellular components, the present study was performed.

MATERIAL AND METHODS

The material consisted of punch biopsies from 2 normal male volunteers and 5 male psoriatic patients, aged 20-48 years. Well established psoriatic lesions, about 2 months old, were selected on each patient and were treated twice daily with an ointment containing 0.1% flubenisolone 17 α -valerate. Specimens were obtained once per week until the lesions were clinically healed. Two of the patients were incompletely healed and have been excluded. The biopsies were fixed in formalin and routinely stained for histopathological diagnosis. Measurements of the cytoplasm, nucleus, and nucleolus of spinous cells were made with a recording microplanimeter (3) at the Institute of Cell Research and Genetics. The measurements were carried out on cells located centrally in the rete pegs. Corresponding microplanimetric estimations of basal cells from untreated psoriatic lesions were carried out to avoid fallacious measurements.

RESULTS AND DISCUSSION

The results are presented in Table 1. No significant differences in the nuclear/cytoplasmic ratio or the nucleolar/nuclear ratio can be demonstrated. When clinically healed, the size of the epidermal cells in the treated area is slightly larger than normal, but the difference is not statistically significant.

Thus, quantitative measurements can be used in the electron microscopic analysis of the course of healing in psoriasis.

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Table 1. *Microplanimetric estimations of cytoplasm, nucleus and nucleolus of spinous cells*

A pooling of specimens in the group 3-6 weeks has been made because of differing clinical responses to the treatment. The biopsies in this group were obtained one week before healing

	Number of cells studied	Mean value (μm^2)		
		Cytoplasm	Nucleus	Nucleolus
Normal skin	100	27.9 ± 6.0^a	18.8 ± 3.1^a	2.3 ± 0.5^a
Psoriasis untreated	100	69.2 ± 13.1	42.7 ± 8.4	7.0 ± 1.1
Psoriasis treated 1 week	100	67.5 ± 11.0	44.4 ± 7.3	7.5 ± 1.4
Psoriasis treated 2 weeks	100	55.5 ± 8.5	36.1 ± 5.3	4.9 ± 2.2
Psoriasis treated 3-6 weeks	100	39.3 ± 9.4	24.5 ± 5.1	3.9 ± 1.5
Clinically healed psoriasis	100	34.7 ± 4.8	22.9 ± 4.0	3.6 ± 0.9
Basal cells of untreated psoriatic lesions	100	51.3 ± 9.3	36.2 ± 10	6.9 ± 1.9

^a Standard error of the mean.

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