

## SKIN SUGAR LEVELS IN NORMAL AND PSORIATIC SKIN

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### Summary

Skin sugar levels were measured in twenty psoriatic patients and normal controls. No significant differences were found in their levels in involved and un-involved psoriatic skin from the normal control skin.

Glycogen is normally not detectable in epidermal basal cells but appears soon after an injury or an inflammation. Following stripping of stratum corneum from normal skin with adhesive tape glycogen appeared within four hours and reached a maximum in 8 to 16 hours and then subsided in 24 hours. This was followed by a burst of mitotic activity 48 hours later<sup>1</sup>. Glycogen accumulation in psoriatic epidermis is well established by histochemical<sup>2</sup>, electron microscopic<sup>3</sup> and biochemical studies<sup>4,5</sup>. Of interest is an earlier finding that uninvolved skin of psoriatic patients has 63% more glycogen than normal skin<sup>6</sup> and that a large number of psoriatic patients reveal an impaired glucose tolerance test<sup>6</sup>. To assess if increased glycogen level of psoriatic skin is due to its increased sugar content, we have measured sugar levels in psoriatic and normal skin.

### Material and Methods

Ten psoriatic patients and an equal number of healthy controls were the subjects of this study. None of the

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persons were using any systemic or topical medication at least 4 weeks prior to biopsy. Biopsies (5mm diameter) were taken from the psoriatic lesion, the uninvolved skin of psoriatic patients and from healthy controls. After rinsing in distilled water, and blotting on a filter paper, the biopsies were quickly transferred to a glass mortar precooled to -20°C in a deep freeze. The biopsies were homogenized by grinding with 0.05M sodium flouride and the crude homogenate was centrifuged for 10 minutes at 4000 r.p.m. An aliquot of the clear supernatant was deproteinized with barium hydroxide and zinc sulfate and subsequently analyzed for sugar by the very sensitive ferricyanide method<sup>7</sup>. Another aliquot was analysed for protein by the method of Lowry<sup>8</sup>.

### Results

Results were expressed as  $\mu\text{g}$  sugar/mg soluble protein. Results were not expressed on a wet weight basis to avoid errors due to an increased cellularity of the psoriatic lesion. Statistical significance was estimated at 5% level by students t test. Our results are shown in table 1. No significant changes were found in either the psoriatic lesion or the uninvolved skin of psoriatic patients as compared to normal skin.

**TABLE 1**  
Skin sugar levels of normal and psoriatic skin

| S. No.     | $\mu\text{g}$ sugar/mg soluble protein |                               |             |
|------------|--|-------------------------------|-------------|
|            | Psoriatic skin                         | Uninvolved skin of psoriatics | Normal skin |
| 1          | 4.4                                    | 4.1                           | 7.4         |
| 2          | 6.6                                    | 3.0                           | 2.7         |
| 3          | 5.9                                    | 6.4                           | 3.9         |
| 4          | 7.4                                    | 7.2                           | 8.8         |
| 5          | 13.1                                   | 11.9                          | 7.3         |
| 6          | 9.0                                    | 13.0                          | 3.1         |
| 7          | 4.8                                    | 7.2                           | 7.8         |
| 8          | 5.3                                    | 6.8                           | 6.2         |
| 9          | 5.5                                    | 6.4                           | 9.4         |
| 10         | 3.9                                    | 2.4                           | 5.5         |
| Mean $\pm$ | 6.6 $\pm$                              | 6.8 $\pm$                     | 6.2 $\pm$   |
| S.E.       | 0.87                                   | 1.1                           | 0.74        |
| P Value    | > .05                                  | > .05                         | > .05       |

**Discussion**

Glycogen synthesis is controlled by an enzyme glycogen synthetase (Form I) and its breakdown by the enzyme phosphorylase. It has been shown that the levels of these enzymes in psoriatic skin do not differ significantly from the normal skin<sup>9</sup>. An "invitro" study has shown that glucose incorporation into glycogen by slices of psoriatic epidermis did not differ from that of normal controls<sup>5</sup>. Our findings do not support the hypothesis that an increased glycogen content of psoriatic skin reflects an increase in its sugar level. It has been reported that hexokinase levels of psoriatic skin are elevated as compared to normal skin<sup>10</sup>. Further studies on the transport of sugar in psoriatic skin and its regulation by various hormones are needed to clarify the relation between the disturbances of skin carbohydrate metabolism and the pathogenesis of psoriasis.

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