# Langerhans' Cells in Seborrheic Keratosis. A Clinical and Ultrastructural Study

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Nyfors A, Krüger PG. Langerhans' cells in seborrheic keratosis. A clinical and ultrastructural study. Acta Derm Venereol (Stockh) 1985; 65: 333–335.

Skin biopsies from 10 patients with seborrheic keratoses were examined by electron microscopy for the presence of Langerhans' cells. Comparing seborrheic keratoses with normal skin of the same patient and with normal skin from controls, neither an increased number of Langerhans' cells nor an increased number of specific granules, Birbeck granules, nor abnormal Langerhans' cells, was found. Melanosomes in a Langerhans' cell were observed in 2 seborrheic keratoses, suggesting phagocytic activity of the Langerhans' cell. *Key words: Bierbeck granules; Phagocytosis by Langerhans' cells.* (Received October 27, 1984.)

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In a study of the ultrastructure of seborrheic keratoses, Wilborn et al. (1) in 1980 state: "because of increased numbers of Langerhans' cells in seborrheic verrucae, it seems appropriate to refer to it as a Langerhans' cell acanthoma and to emphasize the involvement of these cells along with other cutaneous structures in the pathogenesis of the lesion".

The purpose of the present study was to investigate the number of Langerhans' cells in seborrheic keratoses and to compare our findings with the number of Langerhans' cells in normal skin from the same patient as well as from a control group.

## PATIENTS AND METHODS

The patients were consecutive out-patients referred for removal of seborrheic keratoses. The material comprises 10 patients (5 females, 5 males) with an average age of 68 years (Sd: ±5.9 years), range 62–81 years. Skin biopsies from normal skin of 10 patients with contact dermatitis were used as external controls in addition to skin biopsies from normal skin from the same patient with seborrheic keratoses.

Five seborrheic keratoses were removed from each patient and also a punch biopsy of normal skin 2 mm in diameter for control, in most cases taken from the buttocks or nearby. The keratoses were removed under subcutaneous xylocain anesthesia. They were divided into one half for routine histopathological examination and another half for ultrastructural investigation. The first was fixed in formalin and the latter was immediately fixed at room temperature in 2% glutaraldehyde in a 0.1 N cacodylate buffer (pH 7.4) to which was added 0.1 mM $CaCl_2$. Postfixation was performed in 1% $OsO_4$ in the same buffer. The specimens were sectioned into ultra-thin sections using a diamond knife. The ultra-thin sections were contrasted in uranyl acetate and lead citrate and viewed in a Philips Electron Microscope 300. One section from a randomly chosen biopsy was studied from each patient, control and external control. Each section was examined in the electron microscope at a magnification of 6800 times. All epidermal cell profiles containing a fragment of nucleus were registered as either Langerhans' cells or epidermal cells. In the latter grouping both keratinocytes and melanocytes were included. The Langerhans' cells were defined by the rods of their specific Birbeck granules, and they were all photographed for registration of the total number of Birbeck rods per cell profile. Langerhans' cells were counted per 100 epidermal cells.

## RESULTS

The number of Langerhans' cells in seborrheic keratoses, in uninvolved skin from the same patients and in uninvolved skin from the control group of patients respectively, are shown in Table I.

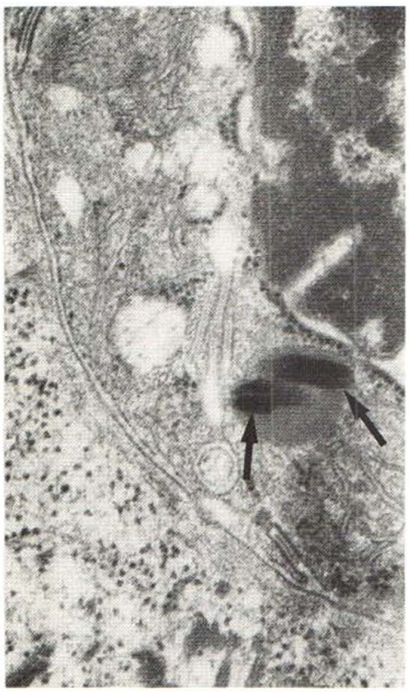

*Fig. 1.* Melanosomes (arrow) occasionally observed within lysosomes of a Langerhans' cell in a seborrheic keratosis. ×41 000.

No statistically significant difference was found in the number of Langerhans' cells in the 3 groups (Mann-Whitney U test, $p<0.05$).

The Langerhans' cells of the external controls, of the internal controls and of seborrheic keratoses seemed to have the same normal morphological appearance. In most cells the nucleus was irregular and indented. No keratin filaments and desmosomes could be observed and normally melanosomes were absent except in 2 seborrheic keratoses, in which a few melanosomes were observed positioned within lysosomes (Fig. 1). The number of the specific granules, Birbeck granules, varied enormously with figures from 1 to 36 per cell profile, as figured from the rods.

## DISCUSSION

The pathogenesis of seborrheic keratoses is still unknown. Electron microscopy examination has confirmed the impression that the small basaloid cells seen in seborrheic keratoses

Table I

| | Number of keratinocytes per biopsy | Number of Langerhans' cells per 100 epidermal cells | Number of Birbech granula per Langerhans' cell profile |
|---|---|---|---|
| Seborrheic keratosis | 205±133 ($n$=10) | 2.41±0.7 ($n$=10) | 7.05±6.5 ($n$=41) |
| Internal controls | 118±65 ($n$=7) | 2.35±1.04 ($n$=7) | 5.9±4.1 ($n$=21) |
| External controls | 168±148 ($n$=10) | 2.33±1.43 ($n$=10) | 8.25±8.35 ($n$=38) |

are related to the cells of the epidermal basal layer (2). The most extensive review on the Langerhans' cell was given by Rowden in 1981 (3), while Stingle & Abeser has reviewed the subject 1983 (4).

We did not find an increased number of Langerhans cells in the seborrheic keratoses. This is in agreement with the finding that sun exposure and therapy with psoralens and long wave ultraviolet light, PUVA, decrease the number of Langerhans' cell surface markers (5). Seborrheic keratoses are developed mainly in sun-exposed areas of human skin. Thus one would not expect to find an increased number of Langerhans' cells in seborrheic keratoses.

The morphology of Langerhans' cells from seborrheic keratoses did not differ from that of Langerhans' cells of the various controls, although in 2 cases a Langerhans' cell lysosome contained melanosomes, which are not a normal constituent of these cells.

Melanosome-containing Langerhans' cells have been reported on a few occasions by others, such as after keratin layer stripping (6, 7), and in a case of vitiliginous skin (8) as well as in nevi and Recklinghausen's disease (9). These authors suggest that the Langerhans' cell has phagocytic capacities and that the melanin granules have been phagocytized by the Langerhans' cells. Our findings in the present study confirm the phagocytic capacity of the Langerhans' cell.

It is difficult to explain the disagreement between the findings of Wilborn et al. in 1978 (10) and our findings as the first group of researchers do not list the number of Langerhans' cells they found in seborrheic keratoses. They do not describe a control material in their study in 1978 (10) nor do they give any figures for an average number of Langerhans' cells per skin unit from the literature.

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