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Original Contributions

Cytokeratin 17 immunoexpression in actinic keratosis (bowenoid and nonbowenoid) and in Bowen disease☆

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ABSTRACT

Cytokeratin (CK) 17 immunoexpression has been investigated in nonmelanoma skin cancer as well as in many preinvasive epithelial malignancies. However, there is not any previous study of CK17 immunoexpression in actinic keratosis (AK) or Bowen disease in nonimmunocompromised patients. We evaluated CK17 immunoexpression in 20 cases of AK (10 nonbowenoid and 10 bowenoid) as well as in 10 cases of Bowen disease. We identified expression of CK17 in the superficial layers above the atypical foci. In some cases, there were foci of expression by the full thickness of the epidermis, which was the predominant pattern in very few cases (1 Bowen disease and 1 bowenoid AK). In addition, 1 case of bowenoid AK showed CK17 expression in a "skyline" pattern in the basal layer of the epidermis. Cytokeratin 17 immunostaining did not allow us to distinguish between the 3 entities studied. However, the immunostaining allowed us to distinguish atypical foci in the biopsies, even if atypicality was minimal. In addition, CK17 was useful in identifying surgical borders involved by disease in cases in which the hematoxylin-eosin was difficult to evaluate. Cytokeratin 17 immunoexpression might have a role in evaluating surgical borders in some cases of AK and Bowen disease.

1. Introduction

Cytokeratin (CK) 17 is a type I CK that plays a crucial role in fetal epidermal development, cutaneous wound repairing, and several dermal inflammatory reactions [1,2]. Cytokeratin 17 is normally expressed by the basal cells of complex epithelia (glandular with myoepithelial component, transitional, and pseudostratified epithelia) [3]. Cytokeratin 17 expression is dependent on the position of the cell in the epithelium and might be involved in spatial organization of epithelial tissues.

In the normal epidermis, most cells do not to express CK17 [3], apart from a few basal cells at the entry sites of the acrosyringium [4]. However, the marker is expressed in the outer root sheet of the hair follicle [3], the suprabasal and cornified cells of the isthmus [5], and the suprabasal and keratinized cells of the sebaceous duct [5]. It is also normally expressed in the epidermal, Merkel cell–rich sensory organs of hairy skin [6]. Cytokeratin 17 expression is also seen in cell cultures of the skin [7,8], and it is induced in activated keratinocytes of the suprabasal layers of the epidermis in some hyperproliferative conditions, such as in psoriasis or after wounding [9]. Cytokeratin 17 immunoexpression is also seen in several types of epidermal malignancies, such as in certain keratinizing types of basal cell carcinoma (BCC) [5] or in invasive squamous cell carcinoma (SCC), including the basaloid variant of SCC [10].

Among other functions, CK17 has been related to the regulation of the size and growth of keratinocytes [2], cell mobility, and cell migration [11]. Because of these properties, the role of CK17 has been investigated in many preinvasive epithelial malignancies, such as in cervical intraepithelial neoplasia [12], bronchial dysplasia [13], oral epithelial dysplasia [14], esophageal intraepithelial neoplasia [15], and anal dysplasia [16]. Moreover, CK17 has been reported as a promising marker in the detection and prevention of oral cell carcinoma [17,18]. However, there is not any study of CK17 immunoexpression in actinic keratosis (AK) or Bowen disease in nonimmunocompromised patients. Proby et al [19] included 2 in situ SCCs from immunosuppressed patients in a study of CK17 immunoexpression in warts, and they described "a combination of basal and suprabasal immunoreactivity" in those SCCs.

CK17 might also be a predicting factor of progression from AK to SCC, the risk of which varies in the literature between 0.025% and 20% for a given lesion. A direct correlation between the degree of immunostaining for CK17 and the degree of epithelial dysplasia has been found in other epithelia, such as the epithelium of the cervix [12].

We decided to test CK17 immunoexpression in 10 cases of nonbowenoid AK, in 10 cases of bowenoid AK and in 10 cases of Bowen disease.

☆ The authors do not have any conflicts of interest.

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Table
Cases studied.

Case	Histopathologic diagnosis	Sex	Age	Location	CK17
1	Nonbowenoid AK, NOS	Male	71	Neck	Uppermost third of the epidermis plus foci with expression in all layers of the epidermis
2	Nonbowenoid AK, hyperthrophic	Male	87	Right ear	Uppermost third of the epidermis
3	Nonbowenoid AK, NOS	Male	80	Scalp	Uppermost third of the epidermis
4	Nonbowenoid AK, hyperthrophic	Male	78	Nose	Uppermost third of the epidermis
5	Nonbowenoid AK, hyperthrophic	Male	88	Nose	Uppermost third of the epidermis
6	Nonbowenoid AK, NOS	Female	91	Not specified	Uppermost two-thirds of the epidermis
7	Nonbowenoid AK, NOS	Female	83	Nose	Uppermost third of the epidermis
8	Nonbowenoid AK, NOS	Female	93	Cheek	Uppermost third of the epidermis plus foci with expression in all layers of the epidermis
9	Nonbowenoid AK, hyperthrophic	Female	92	Chest	Uppermost third of the epidermis plus foci with expression in all layers of the epidermis
10	Nonbowenoid AK, acantholytic	Female	68	Cheek	Uppermost third of the epidermis
11	Bowenoid AK	Male	75	Neck	Uppermost third of the epidermis plus the basal layer of the epidermis
12	Bowenoid AK	Male	90	Cheek	Uppermost third of the epidermis
13	Bowenoid AK	Female	90	Forehead	Uppermost third of the epidermis plus foci with expression in all layers of the epidermis
14	Bowenoid AK	Male	78	Scalp	Uppermost third of the epidermis
15	Bowenoid AK	Female	87	Cheek	Uppermost third of the epidermis
16	Bowenoid AK	Female	77	Arm	Uppermost third of the epidermis plus foci with expression in all layers of the epidermis
17	Bowenoid AK	Female	88	Cheek	Uppermost third of the epidermis, with foci of positivity in the uppermost two-thirds of the epidermis
18	Bowenoid AK	Male	88	Retroauricular	Uppermost third of the epidermis
19	Bowenoid AK	Male	81	Pariethal	Uppermost third of the epidermis
20	Bowenoid AK	Female	80	Forehead	Uppermost third of the epidermis plus foci with expression in all layers of the epidermis
21	Bowen disease	Male	79	Back	Uppermost third of the epidermis
22	Bowen disease	Female	99	Leg	Uppermost third of the epidermis
23	Bowen disease	Female	89	Leg	Full thickness of the epidermis, with foci of positivity in the uppermost two-thirds of the epidermis.
24	Bowen disease	Female	90	Leg	Uppermost two-thirds of the epidermis.
25	Bowen disease	Female	90	Leg	Uppermost third of the epidermis
26	Bowen disease	Male	70	Abdomen	Uppermost third of the epidermis
27	Bowen disease	Female	79	Arm	Uppermost third of the epidermis
28	Bowen disease	Female	83	Leg	Uppermost two-thirds of the epidermis plus foci with expression in all layers of the epidermis.
29	Bowen disease	Female	87	Chest	Uppermost third of the epidermis
30	Bowen disease	Male	62	Back	Uppermost third of the epidermis

Abbreviation: NOS, not otherwise specified.

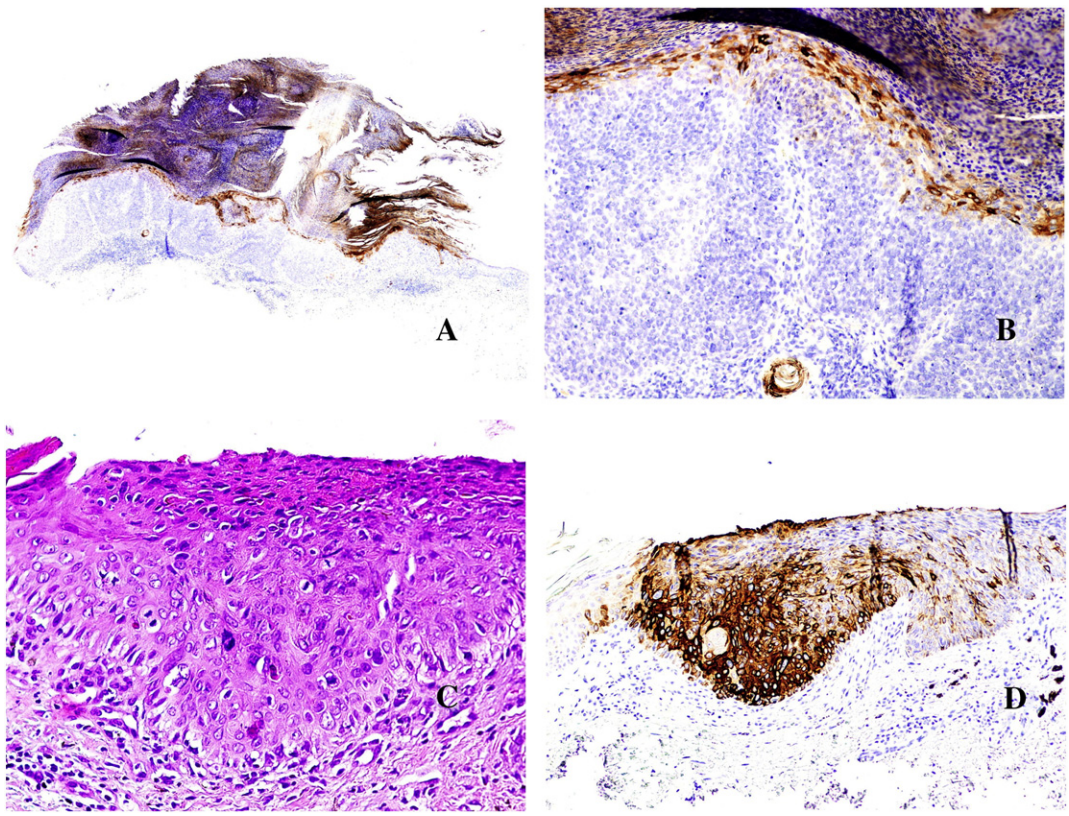

Fig. 1. Cytokeratin 17 was expressed in the uppermost layers of the epidermis in most cases (A and B). However, in some cases, we identified expression in all layers in some foci (D). When re-evaluated in the hematoxylin-eosin slide, the cells of such foci showed a "mature" appearance, with wide eosinophilic cytoplasm (C).