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CLINICAL AND MORPHOLOGICAL FEATURES ACTINIC KERATOSIS

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Abstract

The article presents the clinical and morphological characteristics of different variants of actinic keratosis in 20 patients. It was found that in 18 (90.0%) patients, lesions were localized exclusively to exposed skin areas (face, neck, and back of the hands), while in 2 (10.0%) cases, the rash also appeared on the upper and lower extremities and back. The average patient age was 66.5±3.4 years. Morphologically, 7 cases of hypertrophic, 9 cases of atrophic, and 4 cases of Bowenoid actinic keratosis were diagnosed. The Bowenoid type showed no histological differences from Bowen's disease. Regardless of the histological variant, the dermis exhibited basophilic collagen degeneration and a dense inflammatory infiltrate, predominantly consisting of lymphocytes.

Key words: actinic keratosis; clinic; morphology; inflammation; diagnosis; treatment.

Solar (actinic) or senile keratosis is the most common precancerous skin lesion. The pathology is manifested by focal intraepidermal atypia of keratinocytes which develops mainly on exposed areas of the body under the influence of ultraviolet radiation [1, 2]. The term "actinic keratosis" was firstly proposed in 1959 [3].

The disease is more common in people with light skin phototypes who are exposed to intense insolation. The main etiological factor is recognized as chronic ultraviolet radiation which

causes DNA mutations and contributes to solar elastosis development [4]. It was proved that actinic keratosis can transform into squamous cell carcinoma in the absence of suitable treatment and prolonged exposure to sunlight [5]. According to clinical and histological studies, in 19.3% of cases, squamous cell carcinoma of the skin develops against the background of actinic keratosis [6]. Some scientists consider this condition as the initial phase of squamous cell carcinoma (*carcinoma in situ*) and its earliest clinical form [7].

Modern therapeutic approaches to actinic keratosis treatment are divided into physical, chemical, pharmacoimmune and combined methods [8, 9]. The choice of treatment tactics should be based on the individual characteristics of the patient, taking into account the prevalence of lesions, their localization, age, history, histological features and clinical manifestation of the disease [10].

The aim of the work is to identify the characteristic clinical manifestations and morphological signs of different variants of actinic keratosis which will allow to optimize treatment tactics and to determine the prognosis for patients.

Material and methods

The study was performed on a group of 20 patients who were diagnosed with actinic keratosis. All patients provided written agreement for their examination and treatment results use with scientific purposes.

The diagnosis was verified by histological analysis. Morphologically analyzed were 7 cases of hypertrophic, 9 cases of atrophic and 4 cases of bowenoid actinic keratosis.

Biopsy material for histological examination was collected after obtaining informed consent from patients. The procedure was performed under local anesthesia. The selected samples were fixed in a 10% solution of cold neutral formalin (pH=7.4) for 24 hrs. After dehydration, the tissues were embedded in highly purified paraffin with polymer additives (“Richard-Allan Scientific”, USA) at a temperature not exceeding 60°C.

Serial histological sections 5±1 μm thick were made from paraffin blocks using “Microm HM325” rotary microtome (“Carl Zeiss”, Germany). The obtained sections were stained with hematoxylin and eosin, toluidine blue (pH=2.6 and pH=5.3, correspondently), and the SHIK reaction was performed with control samples pre-treatment by amylase.

Histological analysis was performed using a “Hund H500” microscope (Germany). Microphotographs were obtained using a digital video camera “DCM510” (USB 2.0) (5M pixels CMOS chip) connected to a personal computer. Morphological and morphometric studies of histological preparations were performed on the basis of the Department of Pathomorphology of the University Clinic of Odessa National Medical University.

Results

Among the examined 20 patients with actinic keratosis, 12 were men and 8 were women. The average age of the patients was equal to 66.5±3.4 years. The disease was characterized by slow progression.

Clinically, the manifestations of actinic keratosis appeared as dry, erythematous, moderately infiltrated spots of irregular shape with clear boundaries. The surface of the lesions was unevenly covered with tightly adjacent scales, the color of which varied from yellowish-brown to gray. When they were removed, pinpoint hemorrhages were observed. The skin around the pathological foci had signs of atrophy, telangiectasia and dyspigmentation which is due to prolonged exposure to ultraviolet radiation.

In then majority of patients (18 people, 90.0%) the rashes were localized exclusively on exposed areas of the skin (face, neck, back of the hands). In 2 cases (10.0%) elements of the rash were also found on the upper and lower extremities as well as on the back.

The average number of lesions per patient was equal to 4.2±1.8, and their average maximum diameter was 0.6±0.2 cm. The average age of the first lesion was 12.6±2.7 years.

Pathomorphological examination revealed epithelicytes focal disorganization as well as nuclear atypia of the cells of the Malpighian layer of the epidermis (Fig. 1).

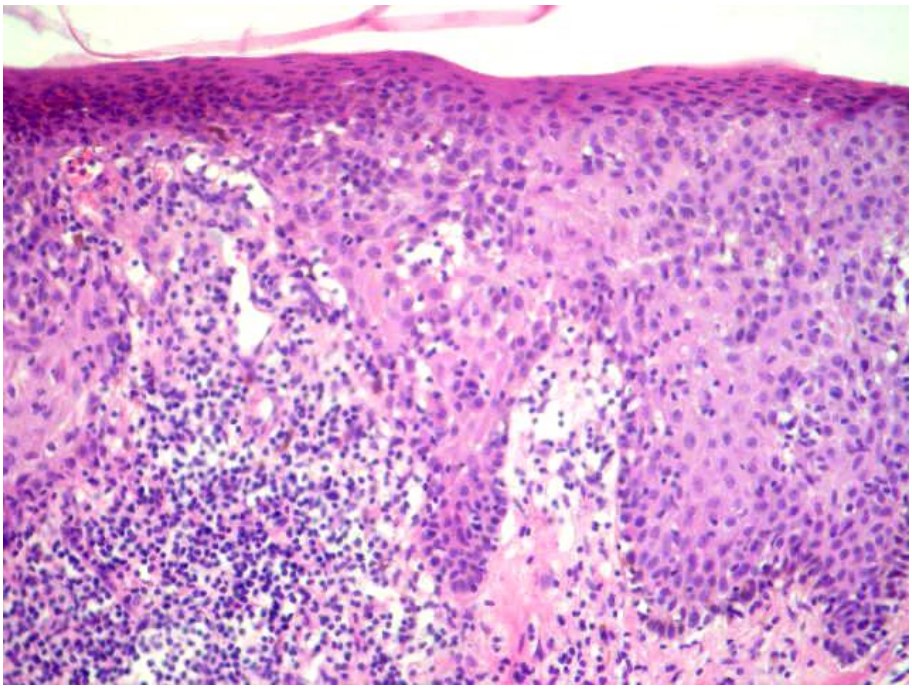

Fig. 1. Actinic keratosis, hematoxylin-eosin stain. ×200

Patients with hypertrophic actinic keratosis demonstrated marked hyperkeratosis with local areas of parakeratosis and slight papillomatosis. Epithelial cells lost their polarity, one could

register their polymorphism and atypia. In some cases, granular layer thickening, perinuclear edema and hypergranulosis were detected. Actinic elastosis was also observed in the dermis.

The atrophic type of actinic keratosis is characterized by epidermal atrophy, basal layer atypia and, in some cases, its proliferation in the form of tubular structures penetrating the dermis. In two cases, cracks and lacunae were found under the basal layer which morphologically resembled Darier disease or lupus erythematosus.

The bowenoid type in all four cases histologically corresponded to the morphological picture of Bowen's disease.

Regardless the actinic keratosis histological variant, basophilic degeneration of collagen fibers was noted in the dermis as well as an expressed inflammatory infiltrate consisting mainly of lymphocytes.

Discussion

To discuss the data obtained we would like to focus on the following important aspects. Important is that actinic keratosis is a pathology of mainly elderly age, more common in men and has a slowly progressive course. In most cases, it is localized on exposed areas of the skin. The rash is usually small in size and variable in number.

The identified histological features of different variants of actinic keratosis can be used to differentiate them and conduct differential diagnosis with squamous cell carcinoma, Bowen's disease, basal cell carcinoma, seborrheic keratosis and discoid lupus erythematosus. This is important for choosing the optimal therapeutic tactics.

Considering the oncological alertness in conditions of actinic keratosis, we consider the diagnostic and preventive aspect of this problem to be vital. Diagnosis of skin cancer in the early stages increases the likelihood of an effective response to treatment, increases the patient's chances of survival and allows the use of less expensive treatment methods. Early cancer detection and the rapid start of treatment contribute to a significant improvement of cancer patients quality of life. It is known that the key in terms of early detection of malignant neoplasms is early diagnosis and/or preventive measures with wide segments of the population of all age groups [11, 12]. We emphasize this, citing data on the possibility of early and successful diagnosis of inflammatory and neoplasms of the skin using dermatoscopy and subsequent (in case of an unclear diagnosis) pathomorphological examination.

Secondly, we draw attention to the pathophysiological importance of the inflammatory process in actinic keratosis development and its probable oncological transformation [13, 14]. We consider it necessary to emphasize the careful care of patients with long-lasting inflammation of unclear genesis, from which, according to fundamental ideas, after a certain period of time an undesirable and life-threatening oncological diagnosis may appear [13, 15-17].

Conclusions

1. Actinic keratosis is a pathology of mainly elderly age, more common in men and has a slowly progressive course

2. Actinic keratosis localizes in most cases on exposed areas of the skin.

3. The identified histological features of different variants of actinic keratosis can be used to differentiate them and conduct differential diagnosis with squamous cell carcinoma, Bowen's disease, basal cell carcinoma, seborrheic keratosis and discoid lupus erythematosus.

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Informed Consent Statement

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Data Availability Statement

The data presented in this study are available on request from the author.