

# Specific Aspects of the Dependence of Morphological Changes of Skin Structures in Psoriasis on Hot Climatic Conditions

Jumanov Ziyadulla Eshmamatovich<sup>1,\*</sup>, Nazarov Jamshid Abdurashidovich<sup>2</sup>

<sup>1</sup>Professor, Department of Pathological Anatomy, Samarkand State Medical University, Doctor of Medical Sciences (DSc), Uzbekistan

<sup>2</sup>Independent Researcher of the Department of Pathological Anatomy of Samarkand State Medical University, Uzbekistan

**Abstract** In order to determine the specific aspects of the morphological and morphometric changes of skin structures in psoriasis, which are associated with hot climate conditions, a pathomorphological examination of biopsies taken from the skin of 66 patients in the summer season was conducted. It was found that in the autumn season, spongiosis is observed in the spinous layer of the skin structures of patients with psoriasis. Perivascular edema also develops strongly in the dermis. It is emphasized that this should be taken into account when treating the disease.

**Keywords** Psoriasis, Keratinocytes, Dystrophy, Epidermis, Dermis, Edema

## 1. Introduction

Psoriasis is one of the most common skin diseases worldwide. Most studies today report a prevalence of 1–5%, with significant variations depending on climate and geographical region [1,2,3]. For example, in Scandinavian countries and among indigenous populations in the far north of Russia, the incidence is high (up to 4%), while in Kuwait it is 0.11%. These are low rates compared to global rates [4,5,6].

**The purpose of the study:** To determine the specific aspects of the dependence of morphological changes in skin structures in psoriasis on hot climatic conditions.

## 2. Materials and Methods

Biopsies taken from the skin of 66 patients registered in the Samarkand regional branch of the Republican Scientific Center for Dermatovenerology and Cosmetology and undergoing regular treatment during the summer season were studied at the Department of Pathological Anatomy of the Multidisciplinary Clinic of Samarkand State Medical University. Macroscopic, microscopic, methods were used to assess the dependence of morphological changes in skin structures in psoriasis on climatic conditions. Histological sections prepared from the slices were stained with hematoxylin-eosin.

Hematoxylin-eosin staining procedure:

It is the most widely used method for staining histological sections.

Sections are deparaffinized in chloroform, washed in distilled water, then a solution of hematoxylin is dripped onto the surface of the section and fixed for 3 minutes. It is washed in running water for 10 minutes and stained with eosin for 0.2 to 3 minutes. Dehydrated in 70° and 96° alcohol, transferred to carbol-xylene and xylene and covered with balsam.

Result: cell nuclei are stained blue-black, cytoplasm - dark purple.

Histological preparations were studied and photographed using a LeicaGME microscope (Leica, India) coupled with a LeicaEC3 digital camera (Leica, Singapore) and a Pentium IV computer. Photo processing was carried out using Windows Professional applications.

Gallbladder adenoma was morphologically evaluated in prepared micropreparations.

## 3. Results and Discussion

The results of the study conducted in the summer season show that in the summer months, when examined under a microscope, vacuolar dystrophy of the cells of the basal layer, a decrease in their number, necrosis of basal keratinocytes and the development of leuko-lymphocytic infiltration in their atrophy are detected. Mitotic division is noted in the remaining cells of the basal layer. In particular, the basal layer cells are prismatic in shape, the nucleus is located in the center, and mitotic division is detected in most cells. Rows of

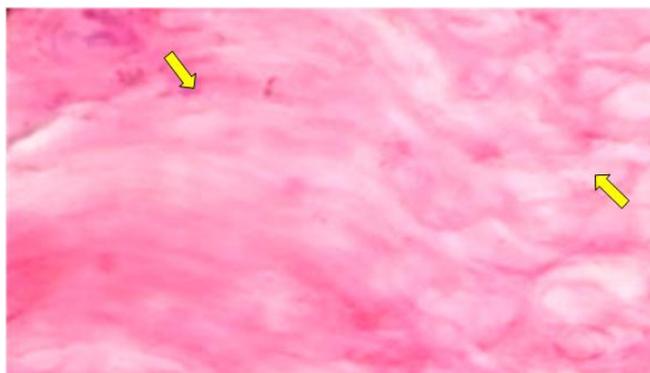
\* Corresponding author:

ziyadulla-jumanov@mail.ru (Jumanov Ziyadulla Eshmamatovich)

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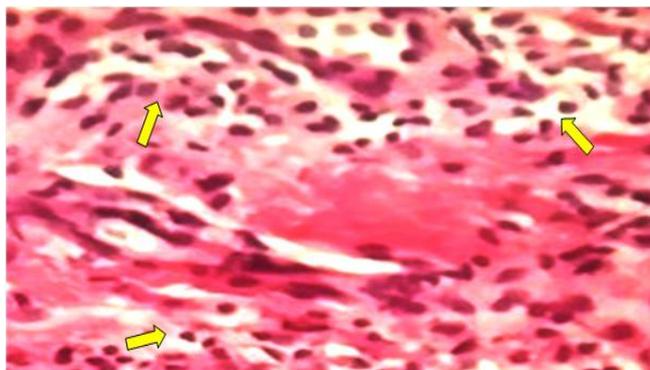
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spinous layer cells are in a state of division. Perinuclear swelling, caripyknozis, karyrexis, and karyolysis in the nuclei of most cells are detected in the cells. The number of granular layer cells has sharply increased, their granularity has increased, and mitotic divisions are clearly visible. The stratum corneum is thin, in most places it is not detected. The stratum corneum is thickened, divided into layers, its cells are separated from each other, and hyperkeratosis is detected (Figure 1).



**Figure 1.** Hyperkeratosis in psoriasis in warm climates. Stained with hematoxylin-eosin. Ob.40, ok.10. Ob.40, ok.10

Against the background of proliferation of epithelial cells, hyperkeratosis, parakeatosis, papillomatosis and inflammatory skin infiltration are observed. A large accumulation of keratinous substance is clearly visible in the hair follicle cavity. The formed numerous acanthosis has a sunken appearance. Epidermal ridges are distinguished by their length and width. In addition, a strong intercellular swelling (spongiosis) is observed. In the superficial layer of the dermis, there is an engorgement of blood vessels, dilation of capillaries, swelling and an inflammatory infiltrate of lymphocytes and histiocytes with an admixture of neutrophilic granulocytes. Their location around the blood vessels is noted (Figure 2).



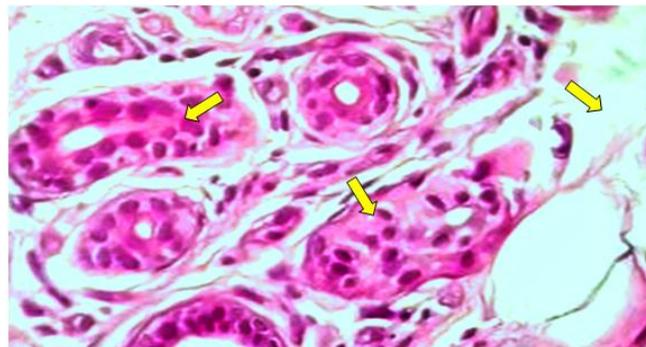
**Figure 2.** In the superficial layer of the dermis, there is an inflammatory infiltrate of lymphocytes and histiocytes with an admixture of neutrophilic granulocytes. Stained with hematoxylin-eosin. Ob.40, ok.10

The dermal layer of the dermis is well-developed with collagen and reticulin fibers, with some swelling. The destruction of elastic fibers and their reduction in quantity are detected. The reticular layer has well-developed collagen and elastic fibers, and some swelling is noticeable (Figure 3).



**Figure 3.** In psoriasis, the reticular layer is a poorly developed tumor with well-developed collagen and elastic fibers. Stained with hematoxylin-eosin. Ob.40, ok.10

The blood vessels are dilated. Up to 6-8 hair follicles, 5-6 sweat and sebaceous glands are detected in one field of view (Figure 4). The hypodermis has full blood vessels, and the fat cells are well developed.



**Figure 4.** Dystrophic changes in sweat and sebaceous glands in psoriasis during the summer season. Stained with hematoxylin-eosin. Ob.40, ok.10

## 4. Conclusions

Thus, in the skin structures of patients with psoriasis, spongiosis is observed in the spinous layer in the summer season. The sebaceous layer of the dermis is well developed, collagen and reticulin fibers develop slightly. Destruction of elastic fibers and a decrease in their number are detected. Collagen and elastic fibers are well developed in the reticular layer. Blood vessels are dilated. Up to 6-8 hair follicles, 5-6 sweat and sebaceous glands are detected in one field of view. The sebaceous layer is well developed. These changes should be taken into account when treating psoriasis in the summer season.

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