

## Morphological changes in the rabbit skin with allergic contact dermatitis

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**Abstract:** In the article results of experimental modeling of allergic dermatitis on the rabbits are considered, occurring thus macro and micro changes which characterized its pathology. 2 stages of skin allergization genesis were established, the first stage - primary and contact reaction (in 24 h) and the second stage - (for the 7th days) spontaneous inflammatory reaction with a total necrosis of epidermis and formation of extensive subepidermal bubbles. Inflammatory reaction was shown with defeat of vessels with destruction and not considerable perivascular infiltrates in which, except mononuclear, were found neutrophil granulocytes and fabric basophiles.

[Omarbekova G., Muralinov K., Muralinova Z., Maulanov A., Makhmutov A. **Morphological changes in the rabbit skin with allergic contact dermatitis.** *Life Sci J* 2014;11(6s):183-185] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 34

**Keywords:** allergic dermatitis, rabbits, modeling, macromorphology, histochanges, vaskulization, infiltrates.

### Introduction

The skin is a natural barrier which prevents penetration of exogene substances. There are enormous numbers of cells in skin, participating in inflammatory reaction, among them are lymphocytes, plasmatic neutrophils. Many of them are cells which are presented in the normal skin, involved in phagocytosis, the reactions promoting removing the allergens, participate in provision of immunological memories. Disease of skin is one of the main reasons of addressing the animal owner to veterinary physician. It detects amongst 20-75% of all examined pets. The one of the frequented reasons of the skin diseases is allergic dermatitis [1, 2, 3].

Experimental allergic contact dermatitis is broadly used as a model for studying the different section currents of allergic dermatome. Studying of morphological changes of experimental allergic contact dermatome allows explaining how the allergic inflammation develops, which is being the basis of the other skin diseases [4, 5].

In the first hours after application of the allergen in the skin of their number increases. In this allergen is bound to macrophages. Macrophages allergen gene to T-lymphocytes in response to this is the proliferation of T- lymphocyte populations forming cells specific to a given antigen. Repeated contact allergen circulating sensitized lymphocytes rush to the charmed -gu allergen exposure. Lymphokines secreted by lymphocytes are attracted to the site of macrophages, lymphocytes, polymorphonuclear leukocytes. These cells also secrete mediators ry, forming an inflammatory reaction of the skin [6, 7].

Expressed in atopic dermatitis and papular skin infiltration lichenization : skin rough stagnant red, with exaggerated skin pattern. In the lesions

expressed melkoplantinchatoe peeling, cracks, excoriations.

In severe cases, the process is different persistence pockets lichenification capture large areas, appearing also on the back of the hands, feet, legs and other areas, developing generalized defeat as erythroderma with increasing peripheral lymph nodes, low grade fever and other common symptoms.

Histologically the epidermis expressed acanthosis, parakeratosis, hyperkeratosis, weakly spongiosa of expression. In the dermis, dilation of capillaries, vessels around the papillary layer, infiltration of lymphocytes spending.

In allergic angiitis death of individual sections of tissue followed iz - yazvleniem skin possible. Cellular infiltration into the skin can have a different origin, often as a result of chronic inflammation, but can be qualitative proliferative malignant cell clone (e.g. lymphomas ). By location distinguish peri- vascular infiltrates surrounding vessels as couplings or possessing diffusely - smiling in the papillary dermis, nodular infiltrates, occupying the entire thickness of the dermis with hardly affected the papillary dermis, which is why between the epidermis and dermal infiltrate strip stays normal collagen (syphilitic papules). Perhaps the formation of granulomas in the type of infiltrate result of granulomatous inflammation, which is based on immune disorders [8, 9, 10].

The purpose of present investigation was a studying the track record of histomorphology modifications genesis, occurring at modeling of allergic dermatitis in rabbit by using 2.4 dinitrochlorinebenzol.

### Material and methods

Work was carried out in the departments "Obstetrics, surgery and multiplication of

biotechnology", "Biosafety" and in the laboratory of engineering profile "electron microscope" Kazakhstan-Japan Innovation Center.

The experiments were organized on 12 rabbits, sensitized to 2,4 dinitrochlorinebenzol by Zalkan P.M. method where 3 dripped of 5% 2,4 dinitrochlorinebenzol solution used one-shot as an applique works inflicted on the centre of sensitize. In sensitivity development on rabbits in clinical and morphological picture of the skin distinguished 2 stages. The first stage - primary-contact reaction (through 24 h) was characterized by limited edema and hyperemia. The second stage - (on 7<sup>th</sup> day) spontaneous inflammatory reaction with all-out necrosis of the epidermis and formation of extensive subepidermal bladders.

The skin biopsy in the all groups produced after decapitation on the 21<sup>st</sup> experimental day. The sample fabric has placed into 10% neutral formalin with the following wiring in increasing concentration alcohol and flooded in paraffin. The histological preparations were prepared by standard methods: were painted by hematoxillin-eozine and azur-2 eozin.

### Results

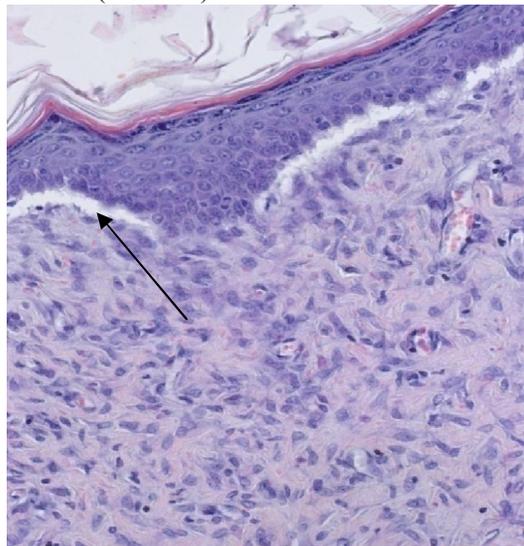
After macroscopic study of the rabbit skin in sensitize area after 12 hours were noted bright redness and skin become swollen (the picture 1), quite often exist the small nodules and bubbles, sometimes - a damness, scales and crusts. In some cases larger bubbles and even big bubble appear, but in one event even necrotic changes.



**Picture 1. After 12 hours noted bright redness and skin become swollen**

Histological detected that skin area sensitized with 2,4 dinitrochlorinebenzol showed increasing of

thickness of granular and horny layers and small accantoze. (Picture 2).

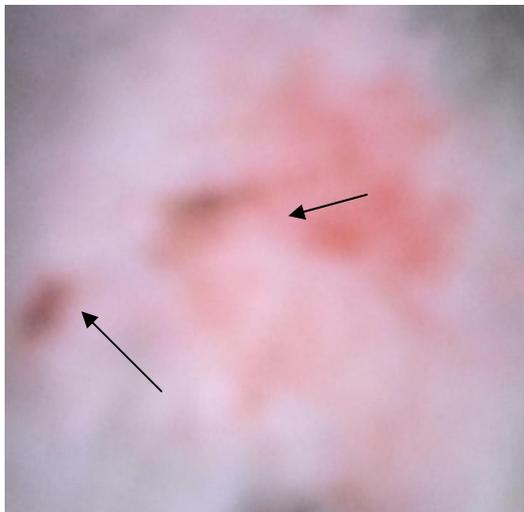


**Picture 2. Increase of the granular and horny layers' thickness and small accantoze. The Coloration by hematoxillin and eouzin. Zooming to 200**

During microscopic study the experienced animal in 24 hours were revealed steadfast redness, bladder rashes and hulling of the skin (picture 3).

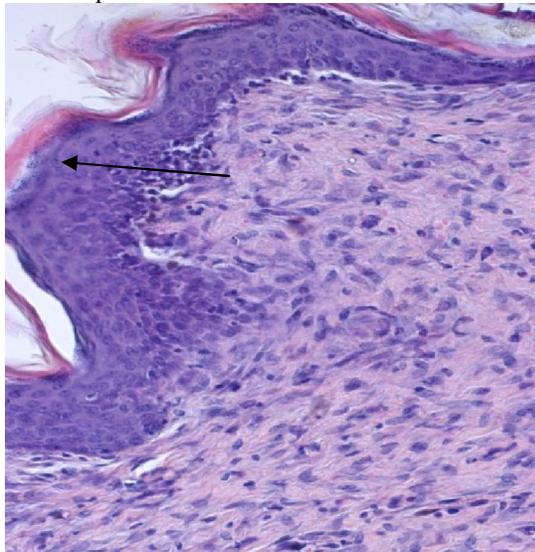
After histological investigation the zones with expressed destructive changes on epidermis with its partial detached retina were found (picture 4).

In the thorned layer intercellular edema was noted with different degree of denominations, as well as even increases the amount of rows in thorned layer on and between teats of derma.



**Picture 3. In 24 hours experienced animals have skin with steadfast redness, bladder rashes and hulling of skin**

In the derma an inflammatory reaction revealed with destructive defeat of vascular and small perivascular infiltrates, in which, except of monoclears were found neutrophyll granulocytes and fabric basophiles.



**Picture 4. Zones with expressed destructive changes of epidermis with its partial detachetrina. Zooming × 200**

The epidermis was mounted thickening with uneven lengthening of interteated accumulations. It was noted moderate ortoceratotal hyperkeratosis with hearth parakeratosis. There were friable horny stoppers into the estuaries hair follicles. The granular layer was differentiated.

Several time the shaping of a spongiotic centers were observed. The derma-epidermal border on all length looked sinuous at the expense of lengthening the teat of derma. Circulatory and lymphatic capillaries of derma were extended a bit with sparingly edema endotely. The moderate edema observed in the derma. Mainly in the teated derma were located hearth and perivascular polymorphic-cellular infiltrates consist of lymphocytes, hystiocytes, single eozinofyles and fibre bazofyles.

In some area the teats of derma already became higher than in controlling group. Concourse of leukocyte cells in the layer of the skin was not exist.

Rabbit skin processed with 2.4 dinitrochlorinebenzol in 24 hours at macroscopic and histological study. The colouration with hematoxilin - eozine. Zooming to 200.

#### **Conclusion**

At appliqué works of the rabbit skin with 2.4 dinitrochlorinebenzol initial pathological changes

develop in epidermis, but in derma they become not so expressed and reveal it only as inflammatory infiltrates. There are 2 stages of the genesis of skin sensitization, the first stage - the primary contact reaction (24 h) and the second-stage (at day 7), the spontaneous inflammatory reaction with total necrosis of the epidermis and the formation of extensive subepidermal blistering. The inflammatory reaction manifested itself with vascular lesions of a destructive nature and significant perivascular infiltrates in the cotoryh than mononuclear cells, neutrophils were observed and tissue basophils.

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4/14/2014