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ABSTRACT BOOK

Immunohistochemical Study of Cytokeratin Expression in Normal Caprine Skin

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Cytokeratins are among the most abundant protein family that constitutes the intermediate filaments in epithelial cells. The purpose of this study was to evaluate the immunohistochemical detection of cytokeratins in normal goat skin. Skin biopsies of 10 healthy goats of 5 different body regions were studied. Human skin biopsies were also used as controls. Samples were fixed in 10% buffered formalin, embedded in paraffin and processed routinely. Serial sections from each block were incubated with anti-human monoclonal antibodies against various cytokeratins. In particular, the immunohistochemical expression of three broad-spectrum cytokeratin markers, AE1-AE3 (recognizing cytokeratins 1-8, 10, 13-16 and 19), MNF-116 (recognizing cytokeratins 5, 6, 8, 17, 19) and 34BE12 (recognizing cytokeratins 1, 5, 10, and 14) and of cytokeratins CK5/6, CK7, CK14 and CK19 was evaluated. Cytokeratins AE1/AE3 and 34BE12 are expressed in all layers of the epidermis. Cytokeratin MNF116 is expressed in the basal and the spinous layer whereas cytokeratins 5/6, 14 and 19 are confined to the basal layer of the epidermis. The epithelium of the sweat glands is stained by cytokeratins AE1/AE3, MNF116, 34BE12 and CK7. Myoepithelial cells of sweat glands express cytokeratin 5/6. Cytokeratins AE1/AE3 and 5/6 are located in the outer and inner sheath of hair follicles, whereas the outer sheath of hair follicles also expresses MNF116, 34BE12, CK14 and CK19. Sebaceous gland cells are stained by cytokeratins AE1/AE3, MNF116, 34BE12, CK5/6, CK14 and CK19. Although a number of human monoclonal antibodies have been shown to cross-react with the farmed ruminant species, the database of reagents for caprine research is limited. This study establishes the value of a panel of anti-human keratin monoclonal antibodies cross-reacting with the caprine skin, which can be applied in routine dermatohistopathology of goats. The expression of cytokeratins can be valuable for the study of epithelial differentiation and the characterization of lesions in goat skin diseases (inflammatory and less frequently neoplastic).

Keywords: Cytokeratins, caprine skin, immunohistochemistry, goats

Immunohistochemical Study of Experimental Infestation of Goats with *Sarcoptes Scabiei*

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Sarcoptic mange is one of the most important ectoparasitic diseases of goats. The aim of our study was to assess the cellular immune response of experimentally infested goats, especially in kids vs. adults. Six naïve kids (<6 months old) and 6 naïve adult goats (>1 year old) were experimentally infested at the face and the back with 50–100 mites of *Sarcoptes scabiei* var *caprae*. Four animals were used as controls. Skin biopsies were taken under local anesthesia from developing lesions on d2, d4, d8, d12, d18, d25, d33, d40, d50, d60, d75 and d90 respectively. Skin biopsies were fixed in a zinc salts fixative and then processed routinely. Hematoxylin-eosin stain was performed and additionally tissue sections were immunostained with monoclonal antibodies against T-cell subpopulations (CD3, CD4, CD8, CD21 and WC1γδ). An intense immunoinflammatory response dominated by a substantial infiltrate of lymphocytes, accompanied by eosinophils, was recorded from 2nd day post infestation to the completion of the experiment. Immunohistochemistry indicated that by 2nd day, numbers of CD3+, CD8+ and γδ+ in epidermis had increased significantly compared to controls ($p<0.05$). Moreover, there was an increased exocytosis of CD3+, CD8+, and γδ T cells located in areas with *Sarcoptes scabiei* than in areas without mites. In dermis, a progressive increase of CD3+, CD4+, γδ+ T-lymphocytes was gradually observed until d90, compared to controls ($p<0.05$). The predominant cells in the inflammatory infiltrate were at all cases CD4+ T cells. Especially in early days of experimental infestation, the CD8+ T-lymphocytes increased significantly. The distribution of all lymphocyte subpopulations in dermis was initially perivascular and throughout the time course became more diffuse. In the dermis CD4+/CD8+ ratio gradually changed from 1.92±0.53 at 2nd day post infestation to 4.09 ± 1.88 at the 90th day of the experiment. It should be noted that in the dermis of kids, γδ+ cells increased significantly ($p <0.005$) in comparison with goats from the 12th to the 90th day post infestation. There was no significant difference in the number of lymphocytes in the face and back, during the infestation both in kids and goats ($p >0,005$). Furthermore, CD21+ cells were absent. Our observations suggest that mites and their derived products cause early recruitment and substantial activation of different T-lymphocyte subpopulations (CD4+, CD8+ and γδ+ cells) in the skin, during experimental *Sarcoptes scabiei* infestation. Especially, the γδ+ T cells respond, by proliferation during early and chronic phases of infestation, in an age dependent manner. The high counts of γδ+ T lymphocytes in kids compared to adult goats, suggests that the skin immune system of young animals relies additionally on γδ+ lymphocytes as the parasitic infestation progresses.

Keywords: Goats, immunohistochemistry, lymphocytes, sarcoptes scabies var caprae, skin