

PATHOLOGICAL STUDIES ON ENZOOTIC RHINITIS OF RABBITS

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Summary

Groups of New Zealand rabbits of 26–30 days old were divided into three groups after bacteriological control examination. Group I. and II. were intranasally inoculated with *Bordetella bronchiseptica* (B.b.) and/or B.b plus *Pasteurella multocida* (P.m.). The third group left untreated as control group.

During the 65 days of experimental period transient serious nasal discharge and sneezing were noticed. During the post-mortem examinations gross lesions could not be seen. Light and electronmicroscopic /EM/ examinations, however, revealed different degree of lesions in the nasal conchae. Mucosal epithelium was hypertrophied, cilia were degenerated and/or desquamated. In the lamina propria mononuclear cell infiltration and in the nasal bones osteocytic osteolysis were observed.

Lesions observed in the nasal conchae of rabbits were similar to those seen in the case of atrophic rhinitis of pigs.

Introduction

The production of hare meat has great importance all over the world. In stocks containing huge number of animals, disease that may decrease the animals' potential, has got special significance. Such disease, enzootic rhinitis with atrophy of the nasal conchae diagnosis can be found in rabbits that's caused by long standing rhinitis that mainly comes as a result of the existence of *Pasteurella* and *Bordetella* bacteria. The aim of our research was to study the alterations caused by two bacterial strain, the *Bordetella bronchiseptica* /B.b./ and the *Pasteurella multocida* type A /P.m./ involved in the diagnosis of the enzootic rhinitis, and to make comparisons between those alterations. And to find out whether there is any similarity between enzootic rhinitis and atrophic rhinitis of pig /AR/.

Materials and methods

Rabbits used in the experiments were 26–30 days old. One week before the commencement of the experiment nasal cavity was bacteriologically examined. The presence of B.b. and P.m. were detected on YPC culture medium. Animals which were free from these bacteria were used only. Control group consists of 5 rabbits. The rabbits were treated with erythromycine for 3 days. Five rabbits of group I. were intranasally inoculated with 10^7 /ml toxin-producing B.b. Ten rabbits of group II. were inoculated with 10^7 /ml toxin producing B.b. and one week later with 10^7 /ml P.m. type A. Experimental and control groups were kept in isolation from each others. The rabbits were euthanased 5 weeks post-infection and the heads were cut longitudinally. Samples from each sides of nasal

conchae were inoculated onto YPC culture media. The nasal conchae were fixed in 8% neutral formalin and/or in Zenker's fixing fluid and embedded in paraffin. Sections were stained with hemalaun-eosin, picro-sirius red, PAS and Kossa's staining methods. For electronmicroscopic /EM/ examination nasal conchae were fixed in 5% buffered glutaraldehyde, post-fixed in 1% osmium tetroxide. After dehydration the nasal conchae were embedded in resin. Semithin sections were stained with toluidin blue. Thin sections were treated with uranyl acetate and lead citrate. For scanning electronmicroscopy dehydrated specimens were coated with gold vapour.

Results and Discussion

In rabbits from Group I. and II. transient nasal discharge and sneezing was observed for 3-6 days. In some of the rabbits from Group II. mild conjunctivitis was also observed. In Group II. one rabbit died of croupous pneumonia after P.m. inoculation. From the lung lesion P.m. were isolated. No clinical signs of disease were seen in the control rabbits. From the nasal cavity B.b. could be reisolated from all rabbits of the inoculated group at the end of the experiment. P.m. was also reisolated from the rabbits of Group II. with the exception of two rabbits. Bacteriological examination of the control rabbits was negative. (Table 1.).

Table 1

	B.b	P.m.
control group /n=5/	-	-
B.b. infected /I./ group /n=5/	5	-
B.b and P.m. infected /II./ group /n=10/	10	8

At necropsy in only two rabbits of Group II could be seen mild atrophy in the nasal conchae. Light and electronmicroscopic examination of Group I. and II. animals revealed similar lesions differed in seriousness mainly in Group II. animals. Comparing to the controls, epithelial cells of the nasal mucous were hypertrophied. In the epithelium and lamina propria numerous heterophyl granulocytes were seen.

In the bone of the nasal conchae osteoblast and fibroblast proliferation were seen. Regressive changes were often seen in the proliferating osteoblasts. Hyaline matrix production in the bone of the nasal conchae was nodular and occasionally development of islands of primitive cartilage was encountered. After picro-sirius red and Kossa's staining deficiency in calcium salt deposition and collagen fibres of the bone were observed. Cilia of the nasal mucous were broken up and desquamated in large areas of rabbits from Group I. and II. as compared to the control rabbits. as it has been revealed by scanning electronmicroscopic examination.

The mucousa was covered with mucus in abundance. Transmission electronmicroscopic examination revealed the basal bodies of desquamated cilia in the epithelial cells of the mucousa of rabbits from Group I and II. In the proliferating osteoblasts the rough endoplasmic reticulum were dilated like cysts and collagen fibres accumulation was seen. The production and calcification of the osteoid

was aberrant.

After the infection, the clinical symptoms noticed in group I. and II., were likely to be the same with the ones that Frymus et al.(1991) and DiGiacomo et al.(1989) have observed. In the dissection of the experimental animals, we have found moderate atrophy of nasal conchae only in two rabbits of group II. During the histological and EM examination, we observed similar alterations in the nasal cavity, in group I. and II. Cilia desquamation of epithelial cells of nasal mucosa, epithelial hypertrophy and heterophil granulocyte infiltration was observed. In the bone of the nasal conchae osteoblast and fibroblast proliferation and osteocytic osteolysis were seen. Regressive changes were often seen in the proliferating osteoblasts. Hyalin matrix production in the bone of the nasal conchae was nodular and occasionally development of islands of primitive cartilage was encountered. After picro-sirius red and Kossa's staining deficiency in calcium salt deposition and collagen fibres of the bone were observed. We observed in none of the experimental groups the significant increase in the number of osteoclasts in opposition with DiGiacomo et al.(1989).

In swine the alteration, in diagnosis of AR the pathological importance of toxin producing B.b and P.m. is proved. In swine the alteration of nasal conchae was produced by either the bacteria or its toxin. Making comparison between our experimental results and the literary data, it seems to be that in rabbits, rhinitis is developed by the toxin producing B.b and P.m. A that is presented milder way because of the effect of bordetella.

Like Frymus et al. (1991) statement, it seems to be that between rhinitis developed by two bacteria, observed in rabbits and the pigs' Ar, there is similarity.

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