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Autor: Biesenbach, W. / Herzog, S. / Frese, K.

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Institut für Veterinär-Pathologie, Justus-Liebig-Universität Giessen, FRG

PERIPHERAL NEUROPATHY IN EXPERIMENTAL BORNA DISEASE VIRUS INFECTION IN LEWIS RATS

W. Biesenbach, S. Herzog, K. Frese

Borna disease virus (BDV) infection, naturally occurring in horses and sheep in Germany and Switzerland (6, 2) causes a severe non purulent meningoencephalitis and retinitis in adult Lewis rats (3, 4). The histopathological lesions are not induced by the virus itself, but by a virus-specific CD 4+ T-cell-mediated immunopathologic mechanism presumably of delayed hypersensitivity type (4, 1).

The virus seems to be of high biological variability (5). Depending on the virus preparation used, rats develop varying clinical disease, including fatal neurological disorder, obesity syndrome with infertility and emaciation.

Here we report on the occurrence of spinal cord and peripheral nerve lesions in experimental Borna disease.

4 weeks old Lewis rats were inoculated intracerebrally with BDV and sacrificed at varying intervals from day 9 up to day 99 after inoculation (p.i.). Brain, spinal cord and sciatic nerves were processed for histopathology, immunocytochemistry and electronmicroscopy. In addition sciatic nerves were processed by the teased fiber technique.

Clinically, beginning with day 19 p. i., the animals developed motoric disturbances including spastic paresis and muscular atrophy of the hindlegs.

Histologically, first encephalitic lesions were observed 14 days p.i. Spinal cord lesions in the lumbar segments L 4 – L 6, the origin of

the sciatic nerve, were found by day 17 p.i. Similar as in the brain spinal cord alterations consisted of mononuclear perivascular and parenchymal infiltrates mainly in the gray matter, followed by marked astrogliosis in the later stages of disease. Overt necrosis of neuronal cell bodies or neuronophagia could not be found. However, occasionally slight chromatolytic changes were seen in dorsal and ventral horn neurons.

In the sciatic nerves and corresponding nerve roots first changes were seen 17 days p.i., resulting in a progressive combined axon and myelin degeneration of Wallerian type. Compared to the severe encephalitic lesions, in the peripheral nerves only a moderate inflammatory response developed, consisting predominantly of macrophage-like cells.

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Dip. Patologia Animale, Fac. Med. Vet., Università di Torino

NOTE 2: GENITAL LESIONS AND EVALUATION OF UTERINE NUCLEAR ESTROGEN RECEPTORS (ER)

B. Biolatti, M. Caramelli, G. Re, P. Badino, G. Benatti

Several experiments have been carried out in order to study the effect of β -agonists on performance of pigs, most of them with cimaterol and few with clenbuterol (Fiems, 1987; Hanrahan 1987). Although particular attention was always given to the performance, carcass and meat quality at present no data are available about genital pathology following β -agonists administration. Therefore the aim of this work is to point out the involvement of female genital tract following the use of β -agonists in finishing pigs.

The number of examined animals and doses of clenbuterol employed for the experiment are described in «Note 1». Ovaries and uteri were weighed and samples from all genital organs were examined histologically after fixation in 10% buffered formalin, samples from uteri were also frozen and examined for nuclear estrogen receptors (ER) with a commercially available monoclonal antibody (ER-ICA, Abbot laboratories, Chicago) using an immunohistochemical technique.

The ovaries of controls showed normal cycling activity as follicle maturation and presence of corpora lutea. In detail, following the classification of Leizer et al. (1988), the ovaries of subject nr. 5 were in metestrus, nr. 6 in middle diestrus, nr. 7 proestrus, nr. 8 in middle diestrus (Tab. 1). By contrast, the ovaries of all treated animals showed the same macroscopical and histological features. The main

finding (tab. 1) was represented by the significant difference of weight between treated (average of 3.44 g) and controls (6.62 g). No corpora lutea were present while a microcystic degeneration was evident, being the biggest follicles about 5 mm wide, resembling in some way the pre-puberal immature ovaries.

The uteri of control animals had an average weight of 765.75 g and normal morphology related to the ovarian activity. Test for the presence of ER was positive in all uteri at a medium intensity.

The uteri of treated animals had an average weight of 264.5 g. The volume was significantly decreased, thereby the uterine wall was thinner than in controls. Histologically the mucosa showed inactivity and the number of endometrial glands was lower than in controls, the glandular epithelium was low with an elongated nucleus occupying almost the whole cytoplasm as well as the epithelium of the endometrial surface.

The immunoperoxidase reaction for ER was strongly positive in all uteri, except for uterus nr. 3 which was completely negative because of a possible artefact.

In cervix and vagina of controls, thickness of the epithelium was variable, depending on the stage of the estrous cycle, up to 10–20 cell layers.