KIDNEY HISTOLOGY OF VACCINATED AND UNVACCINATED COCKERELS EXPOSED TO T-STRAIN INFECTIONOUS BRONCHITIS VIRUS

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Histological examination was conducted of kidneys made available from a previous experiment, which investigated different infectious bronchitis virus (IBV) vaccination protocols for laying hens (Sulaiman et al., 2001). Histological changes were used as a possible measure of the level of protection afforded by different vaccination protocols.

Kidneys were examined from ISA Brown cockerels that were vaccinated at day old or two weeks by coarse spray, eye-drop or drinking water and then revaccinated by the same routes at 8 weeks. A control group of unvaccinated birds was also maintained. Ten birds from each group were challenged at 11 weeks of age with T-strain infectious bronchitis virus. Five birds from each group were euthanased at one, two and three weeks post exposure and the kidneys preserved for histological examination. At each time interval following exposure to T-strain IBV, kidney sections were prepared from the birds with the largest and smallest kidneys (as a percentage of body weight), stained with haematoxylin and eosin, and examined for histological changes (a total of 6 birds per treatment, 2 kidneys per bird, 3 divisions per kidney). Also, the cranial divisions were examined for all 5 birds in vaccinated groups that showed histopathology.

The unvaccinated birds, at one week post-infection, all showed some degree of histopathology, although the severity of the lesions varied between individuals. The histopathological signs displayed by the birds in this group ranged from minimal monocyte infiltration, to dense widespread lymphocyte infiltration and necrosis of renal tubules. The majority of infiltration was observed in medullary regions of the kidney. The collecting ducts in the most affected areas of the kidney were distended and contained granulocytic casts. Although it varied between birds, generally the pathological signs were observed equally in all three divisions of both the right and left kidney. Unvaccinated birds that were euthanased at two and three weeks after exposure to the T-strain virus showed an initial increase in the area of dense monocyte infiltration into cortical regions and then regression at 3 weeks to the medullary areas. This suggests a progression of the nephritis that can be used as a guide to indicate severity and duration of an infection.

None of the vaccinated birds exhibited clinical signs following exposure to T-strain IBV. Based on histological examination, all of the vaccination protocols appear to have protected the birds against kidney lesions to some degree. Individual birds in most treatments showed varying levels of minor monocyte infiltration but no further lesions, indicating a mild reaction that had been halted by the birds' primed immune systems. However, a reaction comparable in severity to those observed in the unvaccinated birds was seen in two of the vaccinated groups, vaccination by drinking water at day-old (4 out of 5 birds) and vaccination by coarse spray at two weeks (2 out of 5 birds). The lack of protection in the water-vaccinated birds may result from the birds not drinking sufficiently to receive an adequate dose of active vaccine virus. The response of the spray-vaccinated birds may be due to individual variation in the susceptibility of the birds, or to some other factor that compromised the birds' immune status.


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