

CASE REPORT

BOVINE TUBERCULOSIS IN A WHITE-TAILED DEER (*Odocoileus virginianus*)

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Introduction

In November 1958, while examining deer carcasses for parasites at a game checking station of the Ontario Department of Lands and Forests, Gravenhurst, Ontario, lesions of tuberculosis were found in one of 440 deer examined. This report is presented because this disease is apparently rare in deer.

History

All the animals shot in the area were presented at this station by the hunters who had eviscerated them at the time of shooting. Consequently, little or no history was available. The hunter in this instance reported that the deer appeared normal when alive but at evisceration he noted "beads" on the pleura. He had not noted any other abnormality. Upon examination at the station, granulomatous lesions were evident in an irregular pattern on both sides of the thoracic cavity. They were greyish-red in colour, about 1 cm. in diameter, pedunculated and on incision small areas of caseation necrosis and some calcification were evident. Some of the lesions were removed for further examination. The carcass was in good condition; the kidneys were normal; the peritoneal cavity was normal and the body lymph nodes showed no macroscopic lesions. The deer was judged to be two and one-half years old by dental examination and to belong to the species *Odocoileus virginianus*, the white-tailed deer.

Laboratory Examination

The lesions were examined in the pathology and bacteriology laboratories of the Ontario Veterinary College.

Pathology

On histopathological examination most of the masses were seen to be composed of caseous, necrotic material which appeared calcified in most areas. A thin border of fibroblastic tissue at the periphery contained numerous giant cells and a sparse population of lymphocytes and histiocytes. The outer layer of the masses was composed of dense fibrous tissue.

Bacteriology

Ziehl-Neelsen stain revealed numerous acid-fast organisms resembling *Mycobacterium*. Inoculation of the tissue into guinea pigs produced generalized lesions resembling tuberculosis. Histopathological examination of the guinea pig spleen, liver, lung and lymph nodes showed irregular, confluent zones of

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coagulation necrosis, not all of the same duration. Around some foci, an irregular zone of reactive round cells and a few giant cells could be seen. In many areas, a later episode of necrosis was superimposed on the reactive zones and the more recently necrotic tissue was not bordered by inflammatory cells. Acid-fast stains on tissues revealed acid-fast organisms scattered singly or in small groups throughout necrotic areas and in the cytoplasm of giant cells and mononuclear histiocytes.

Acid-fast organisms were seen on direct microscopic examination of smears. The organism was not isolated by culture from the original material. Isolation was, however, made from the guinea pig tissues at The Animal Diseases Research Institute, Hull, Quebec, and identified as *Mycobacterium bovis*. This finding was verified at the Ontario Department of Health Laboratories.

Discussion

Reports of tuberculosis in the wild deer of North America are few in number. Levine (2) described two cases of tuberculosis in white-tailed deer in New York State in 1934. Both of these animals had multiple lesions in the parietal pleura and lungs. In neither of these cases were abnormalities noted before they were killed. The counties of origin of these two cases were reported to have high infection rates in cattle. Levine suggested that exposure of the deer may have arisen through their mingling with cattle on contaminated pastures. The bovine-type tubercle bacillus was isolated from one of the New York cases.

Another report of tuberculosis in white-tailed deer is that of Ferris *et al* (1) in 1961. Acid-fast organisms were found in tubercular lesions in the lungs of two deer in Illinois. Bacteriologic culture was not attempted.

Since the exact locality from which the presently considered animal was taken was not determined, it is not possible to make inferences regarding its possible exposure to tuberculous cattle. It is possible, however, that infection could be maintained in deer in nature. Levine (2) regarded the normal winter yarding habits of deer as predisposing to transmission within the deer herd. Infection of free-ranging deer with bovine-type tubercular organisms could be regarded as a possible means of farm-to-farm transport of infection and since deer are frequently abundant in farming areas, this could have importance in the campaign to totally eradicate bovine tuberculosis. The actual frequency of tuberculosis in deer may be much higher than published reports would indicate. Only the more severe cases would be noticed by untrained persons. It might be recommended that careful examination of deer carcasses for tuberculosis be instituted. This would provide useful data regarding the true incidence of the disease in deer.

The health hazard to persons handling the carcasses of infected deer is probably similar to that encountered by abattoir workers in the handling of infected cattle and should not be overlooked.

Summary

A report is presented on a natural case of *Mycobacterium bovis* infection in a white-tailed deer (*Odocoileus virginianus*).

Résumé

Un cas d'infection naturelle à *Mycobacterium bovis* chez le chevreuil (*Odocoileus virginianus*) est rapporté.

Acknowledgements

The assistance of members of the Department of Pathology and Bacteriology, Ontario Veterinary College, is appreciated.

References

1. FERRIS, D. H., BEAMER, P. D., ALBERTS, J. O. and TRAINER, D. Tuberculosis in transported deer. J.A.V.M.A. 138: 326. 1961.
2. LEVINE, P. P. A report on tuberculosis in wild deer (*Odocoileus virginianus*). Cornell Vet. 24: 264. 1934.

ABSTRACT

Renal Tubular Nuclear Inclusions of Lead Poisoning. Angevine, J. M., Kappos, A., De Gowin, R. L., and Spargo, B. H. Archive of Pathology, Vol. 73, No. 6, 66:74. 1962.

The authors report a case of lead poisoning in man and the experimental study on twelve 4-month-old male white rats fed a diet containing 1% lead acetate for 24 weeks. Intranuclear inclusions in the renal tubule and liver parenchymal cells in man with lead poisoning have been recognized since 1936. The gross changes in the kidneys in chronic lead poisoning are nonspecific; however, findings have been reported which were suggestive of tubular dysfunction. Electron microscopic examination of nuclear changes were not rewarding whereas it is reported that the morphologic similarity of the nuclear changes in human and experimental material suggests that further understanding of the pathogenesis of renal dysfunction may be arrived at by an extension of this experimental approach.

Chronic exposure to lead is required to produce the intranuclear inclusions in the rat, for inclusion bodies were observed with regularity only after the rats had been on the diet for 2 months. H.C.R.

ABSTRACT

Effects of Chronic Food Restriction in Swine. Calloway, Doris H., Hilf, R., and Munson, A. H. Journal of Nutrition, Vol. 76, No. 4. 365: 373. 1962.

This paper reports a study carried out on 10 "miniature" vasectomized male pigs (Hormel Institute strain) underfed a human diet. In man actuarial studies have uniformly shown that obesity is associated with shortened life expectancy and increased incidence of cardiovascular and renal disease. In this study paired animals were given the diet in amounts that allowed only 50% of the weight gain of the fully fed group. Serum cholesterol, phospholipids and ketones were slightly increased in the restricted group and vascular changes were indicative of delayed aging; however, there was an enhancement of tumorigenesis in this underfed group. H.C.R.