PATHOLOGY OF TUBERCULOSIS IN RED DEER *(Cervus elaphus)*

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INTRODUCTION

Thorough necropsies and histopathological examinations were performed on 51 red deer which comprised an experimental herd being used to evaluate the efficacy of the tuberculin test.

MATERIALS AND METHODS

Details of the trial have been described by Corrin *et al.* (1984). In summary, all deer were run together on pasture at Flock House and were repeatedly tuberculin negative prior to commencement of the trial. 36 deer were inoculated into the trachea with cultures of *M. bovis* and 15 non inoculated deer were farmed incontact with the inoculated animals. Deer were run as 2 groups, one group on 3 week tuberculin testing, the other on 6 week testing. Animals were slaughtered at various stages during the 17 month post inoculation period of the trial and detailed necropsies performed. All animals were slaughtered by the completion of the trial. All lesions of any nature from all deer and a range of normal tissues from all deer were examined histologically. All lesions and pools of normal tissues from all animals were cultured for *M. bovis*.

RESULTS AND DISCUSSION

Lesions were not found in 4 inoculated deer. Deer 21 and 31 were culturally positive and were both tuberculin positive. Deer 26 and 52 were culturally negative, 26 was tuberculin positive at the first test 6 weeks after inoculation, then negative for two subsequent 6 weekly tests prior to slaughter; deer 52 gave variable tuberculin reactions but was positive for the first two 6 weekly tests.

Lesions were not found, nor was there cultural evidence of infection in 3 of the 15 non inoculated control deer. Deer 5 was tuberculin positive 21 weeks and deer 23 tuberculin positive 27 weeks after cohort inoculation. Deer 24 gave an equivocal tuberculin reaction 21 weeks after cohort inoculation.

The distribution of lesions in inoculated deer is shown in Table I. All lesions were culturally positive for *M. bovis*. Not surprisingly most lesions were present in the lungs and bronchial lymph nodes. The mesenteric and retropharyngeal lymph nodes respectively, were the next most frequent sites of lesions in inoculated deer.

The distribution of tuberculous lesions in 15 non inoculated incontact deer is shown in Table II. Lesions were culturally positive for *M. bovis*. Lesions were most prevalent in the head (38%), of equal frequency in the thorax and abdomen (22%) and least prevalent in the body (16%). The most frequently affected organs in decreasing order were: retropharyngeal lymph node, mesenteric lymph node, tonsil, mediastinal lymph node, prescapular lymph node, thoracic pleura, bronchial lymph node, popliteal lymph node. These results are in general agreement with the findings of Livingstone (1980) cited by Beatson (1981), who found that the head was the most frequently affected area and the retropharyngeal lymph node the most frequently affected organ in field cervine tuberculosis. The absence of lung involvement despite lesions within other thoracic organs in this group of deer is interesting.

Nine inoculated and 6 non inoculated-incontact deer were found to have a singleton lesion at necropsy. These lesions were confirmed culturally. The location of these lesions is shown in Table III. The sites involved, especially the tonsil, popliteal and prescapular lymph nodes, emphasise the need for a systematic and thorough post mortem.

Lesions in lymph nodes were usually noted as pale swollen entire nodes or pale asymmetric swellings within part of the node, on cut surface the lesions resembled abscesses, with cream coloured often frankly liquid content. Affected lungs in inoculated deer often showed red-cream mottling of the pleural and cut surface, corresponding to the alternation of caseous and hyperaemic lobules. Calcification within caseous lesions was a feature of the lung lesions, but not of other lesions in other organs. Lesions within tonsils were usually focal, pea sized, pale creamy nodules; these were often grossly indistinguishable from nodules of debris trapped within tonsillar crypts.

Though variable grossly, tuberculous lesions were consistent microscopically and were always granulomatous with a variable cellular margin of large macrophages and giant cells surrounding a prominent central zone of caseous necrotic cellular debris. Numbers of acid fast bacilli within tissue sections varied widely, from none seen, to large numbers seen. Neutrophils were usually present and often large drifts of degenerate neutrophils were observed within the caseous debris,

it is probably the presence of degenerate neutrophils that causes the more liquid content of cervine tubercles when compared with the more inspissated and calcified lesions typical of bovine tuberculosis. Neutrophils in large numbers are not a feature of bovine tuberculosis.

A number of slides of gross and histopathological lesions from the trial deer were shown.

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TABLE I LOCATION OF TB LESIONS IN 36 RED DEER INOCULATED INTRATRACHEALLY WITH *M. bovis*.

Site	Frequency No	Frequency %
Retropharyngeal l.n.	8	10.0
Mandibular l.n.	1	1.3
Tonsil	3	3.8
HEAD	12	15.1
Thoracic pleura	5	6.3
Lung	23	29.0
Bronchial l.n.	14	18.0
Mediastinal l.n.	3	3.8
THORAX	45	57.1
Mesenteric (incl. ileocaecal)	10	12.6
Abomasal l.n.	1	1.3
Liver	2	2.5
Kidney	3	3.8
Spleen	1	1.3
Intestine (Jejunum 1) (Ileocaecal 1) (Caecum 2)	4	5.0
ABDOMEN	21	26.5
Prescapular l.n.	1	1.3
BODY	1	1.3

4 inoculated deer did not develop any lesions

All lesions were confirmed by culture

TABLE II LOCATION OF TB LESIONS IN 15 NON INOCULATED RED DEER RUN IN CONTACT WITH TB INFECTED DEER

Site	Frequency No	Frequency %
Retropharyngeal l.n.	4	22.0
Tonsil	3	16.6
HEAD	7	38.6
Thoracic pleura	1	5.5
Bronchial l.n.	1	5.5
Mediastinal l.n.	2	11.0
THORAX	4	22.0
Mesenteric l.n.	4	22.0
ABDOMEN	4	22.0
Prescapular l.n.	2	11.0
Popliteal l.n.	1	5.5
BODY	3	16.0

TABLE III SITE AND FREQUENCY OF CULTURALLY POSITIVE SINGLETON LESIONS IN TUBERCULOUS RED DEER

Site	Frequency
INCONTACT DEER (n = 15)	
Tonsil	2
Retropharyngeal l.n.	1
Prescapular l.n.	2
Popliteal l.n.	1
INOCULATED DEER (n = 36)	
Retropharyngeal l.n.	1
Lung	5
Bronchial l.n.	2
Mediastinal l.n.	1