MYCOPLASMA ISOLATES FROM PNEUMONIA IN CAPTIVE ROCKY MOUNTAIN BIGHORN SHEEP

Authors: ALAN WOOLF, DAVID C. KRADEL, and GEORGE R. BUBASH
Source: Journal of Wildlife Diseases, 6(3) : 169-170
Published By: Wildlife Disease Association
URL: https://doi.org/10.7589/0090-3558-6.3.169
MYCOPLASMA ISOLATES FROM PNEUMONIA IN CAPTIVE ROCKY MOUNTAIN BIGHORN SHEEP

Pneumonia in both wild and captive bighorns is responsible for considerable mortality and has been frequently reported in the literature. The definitive etiology or etiologies of this pneumonia complex are unknown; although lungworms (Protostrongylus sp.) and various bacteria, particularly Pasteurella sp. have been incriminated.

This report describes a pneumonia complex in captive bighorns from which mycoplasmas* (PPLO-Pleuropneumonia-like organisms) were a consistent isolate both from the lungs of dead sheep and from nasal cultures of live sheep.

Disease Description

Between December 1968 and January 1970 (14 months), 5 of 14 captive bighorns died from the pneumonia complex despite maintenance under excellent hygienic conditions and intensive prophylactic and therapeutic treatment with bacterins, sulfanamide drugs and antibiotics. Morbidity was 100%. Signs included fever, cough, dyspnea (rarely), mucopurulent nasal discharge, loss of weight, and an unthrifty appearance. Some animals would have transient periods of improvement, only to relapse or be found dead.

Pneumonia was the primary finding at necropsy. Lung consolidation varied from hepatization of the apical, cardiac, and anterior diaphragmatic lobes to involvement of most of the lung area. Abscesses, from pinpoint to over 12 cm in diameter, fibrinous pleuritis, fibrinous pericarditis, and lungworms were observed in most animals. Histological changes included plugging of the alveoli and bronchioles with polymorphonuclear leukocytes, macrophages, fibrin, and cellular debris; peribronchiolar mononuclear cell infiltrates, microabscesses, caseation with incapsulation, clumps of bacterial colonies, hemorrhage, fibrosis, and atelectasis.

Bacterial Isolates and Nasal Culture Surveys

Bacterial isolates (at least six areas of lung cultured from each bighorn) included mycoplasmas and a Streptococci sp.,** from all sheep, with infrequent isolates of Proteus sp., Pseudomonas sp., E. coli, and Bacillus sp. Virus isolation attempts have been unsuccessful to date.

Nasal swabs were collected from 12 bighorns on 5 September and mycoplasmas were isolated from 3. Streptococci sp. was isolated from 6, including 2 that yielded mycoplasma isolates. Other isolates were E. coli, Bacillus sp., and Candida sp., but Pasteurella sp. was not found in spite of specific efforts to search for that organism. Utilizing a selective mycoplasma broth medium*** cultures were again taken on 15 October from 10 sheep and mycoplasmas were isolated from 9.

The mycoplasmas isolated were not further defined, but were submitted to NADL for possible further identification.

** The Streptococci sp. isolate did not fall into serogroups A, B, C, D, E, F, K, L, M, N, O, P, Q, R, or S.

*** Media formulas and procedure for mycoplasma isolations are available on request from G. R. Bubash.

Downloaded From: https://bioone.org/journals/Journal-of-Wildlife-Diseases on 02 May 2019
Terms of Use: https://bioone.org/terms-of-use
Discussion

The importance of the mycoplasmas to the pneumonia complex described in this paper cannot be accurately assessed. The health of this herd, as judged by clinical signs, weight loss, hematological studies, and deaths appeared to reach maximal deterioration about the time nasal cultures were taken in October and mycoplasmas found in 9 of 10 animals. Mycoplasmas are known to be involved in certain respiratory diseases of cattle, swine, poultry, laboratory animals, dogs, man, and domestic sheep (Boidin et al. 1958, Cornell Vet. 48: 410; Grieg. 1955, Can. J. Comp. Med. 19: 265). Nevertheless, mycoplasmas have also been isolated (usually from nasal or tracheal material) from some clinically normal animals, so their role as possible opportunists must be considered.

The other bacteria isolated from these sheep, with the exception of the Streptococci sp., were inconstant and considered true opportunists or contaminants.

Virus isolation was attempted in two cases, but was unsuccessful as have been similar attempts by other workers (Rest et al. 1967, J. Wildl. Dis. 3: 74; Howe et al. 1966, J. Wildl. Dis. 2: 34). These failures do not eliminate the possibility of a primary or synergistic viral influence when the difficulties associated with virus isolation work are considered.

The pathological changes observed were not especially helpful in defining etiology. In the later stages of pneumonia, chronicity and inflammatory response to secondary agents create a large overlap in histopathological changes. The changes observed did indicate that bacterial infection had an important role in the deaths.

If experience with the pneumonia complex in domestic livestock can be applied to bighorn sheep, it seems likely that when the complex is better defined there will be multiple etiological agents (viruses, bacteria, parasites) — some of which will be found in clinically normal animals — that may interact with each other as well as environmental variables to result in overt disease. This report suggests that mycoplasmas should be considered one of these possible agents and further investigated.

Acknowledgements

The authors express their appreciation to Drs. Harry and William Prothero for their long-time interest and consultation concerning problems in the bighorns; to Mr. R. K. Mellon for providing the opportunity to conduct this work; to Dr. J. D. Todd, University of Pennsylvania Veterinary School, for virus isolation attempts; to R. D. Shultz for serotyping of the Streptococci; to Mrs. Glenda Loop for technical help; and to Mr. W. Barkley for his help and advice.

ALAN WOOLF


DAVID C. KRADEL and GEORGE R. BUBASH

Animal Diagnostic Laboratory, Dept. Veterinary Science
Pennsylvania State University, University Park, Pennsylvania

February 12, 1970