

Sensitivity and specificity of clinical signs, thoracic auscultation, thoracic ultrasound and thoracic radiography in diagnosing respiratory disease in small ruminants

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Introduction

Bronchopneumonia in small ruminants results from infection with viral and bacterial agents. Auscultation alone is often inadequate for diagnosis due to the difficulty in differentiating pathology from normal bronchovesicular sounds. The objectives of this study were to determine the sensitivity and specificity of auscultation, ultrasonography, and radiography to diagnose bronchopneumonia in small ruminants.

Materials and methods

Twenty-six goats were enrolled in the study. Baseline auscultation, ultrasound and radiographs were obtained on Day 0. Randomized inoculation with *Pasteurella multocida* was performed on Day 7 in 4 goats. Natural respiratory disease occurred from Day 1 in some goats. Respiratory clinical signs and results of auscultation, ultrasonography and radiography were recorded for all goats on days 8, 9, 14, 15, 16, 17, 18, 19, 20 and 21. Random euthanasia of goats was performed on days 9, 15, 17, 21. Gross necropsy and measurements of lung lesions were performed on all goats. Data was also collected from small ruminants presenting to teaching hospitals with respiratory disease.

Results

Compared to lung consolidation at post-mortem examination (reference standard), the sensitivity of thoracic ultrasonography and radiographs were higher compared to thoracic auscultation (Se = 80-81%, 18.8%, respectively). However, thoracic auscultation was more specific (Sp = 66.7%) in identifying non-pneumonic goats compared to ultrasonography and radiographs. Coughing proved to be the most specific and sensitive clinical sign (Se = 93.8%, Sp = 55.6%).

Significance

Our findings indicate that thoracic auscultation, ultrasonography and radiographs are valuable tools for the detection of bronchopneumonia in goats. Further, coughing was a reliable clinical finding in goats with bronchopneumonia.

