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PROGRAMME AND SCIENTIFIC PROCEEDINGS
Introduction

Diseases associated with cough maybe grouped according to those characterised by fever and those without fever. Keep in mind that exceptions to generalisations always can occur.

Cough with fever

Horses with cough and fever should have a thorough physical examination. A minimum laboratory database should include a haemogram and fibrinogen determination. The thorax should be auscultated in a quiet room with the horse breathing quietly. If the horse is not dyspnoeic or hypoxemic, auscultation during forced breathing (rebreathing-bag test) should be undertaken. Crackles and wheezes suggest that pulmonary parenchymal disease is present. Accentuated normal bronchovesicular sounds sometimes are present with pulmonary consolidation, because of referral sounds from the aerated lung. Absence of lung sounds may indicate that pulmonary consolidation, atelectasis, or pleural fluid may be present. Thoracic percussion and sonographic evaluation may document the presence of pleural cavity fluid. Ultrasonography also may show pleural irregularities, superficial parenchymal abscessation, atelectasis, or consolidation. Radiographs are especially helpful in demonstrating deeper parenchymal disease. Abnormal lung sounds, percussion irregularities, and sonographic evidence of fluid or consolidation are indications for performing transtracheal aspiration (TTA) and bronchoalveolar lavage (BAL). First perform TTA to obtain a sample for culture, before the BAL tube contaminates the airway. Despite the development of guarded culture swabs for transendoscopic use, this technique does not always prevent contamination. An increase in polymorphonuclear leukocytes (PMNs) in TTA/BAL is consistent with parenchymal disease. If parenchymal disease is not generalised, BAL may miss the diseased region. Results of BAL fluid analysis are normal in some horses with pneumonia/pleuropneumonia. TTA consists of secretions from both lungs and was abnormal in all horses with pneumonia and pleuropneumonia in one study. The presence of degenerate PMNs and extracellular or intracellular bacteria in TTA/BAL fluid indicates a septic process. Gram stain can help to guide the initial choice of antimicrobial agents. Growth of aerobic and anaerobic bacteria in a culture of TTA fluid confirms the presence of bacterial pneumonia if clinical, ultrasonographic and radiographic findings are also consistent with this disease process. Lack of growth of bacterial pathogens from TTA fluid suggests that viral, interstitial, or fungal pneumonia may be present (paired serum samples taken 10-14 days apart). Mycobacteria can
be rarely involved. Fungal cultures of tracheal fluid should be evaluated when other more common causes have been ruled out and if the clinical signs are consistent with this diagnosis. Negative results on serologic tests and fungal cultures with a significant interstitial pattern on thoracic radiographs should prompt consideration of the diagnosis of interstitial pneumonia (grave prognosis).

Many horses with bacterial pleuropneumonia have elevated pleural fluid PMN concentrations and intra- or extracellular bacteria on cytological evaluation. Thoracic fluid should be cultured aerobically and anaerobically. A positive culture identifies the cause of bacterial pleuritis; however often cultures may be negative. Occasionally neoplastic cells may be identified in thoracic fluid. Intrathoracic neoplasm may cause cough with or without accompanying fever. Confirmation of a thoracic tumour may require an ultrasound-guided biopsy or an exploratory thoracoscopy with biopsy. Secondary bacterial pleuritis may complicate neoplasms, and aerobic and anaerobic cultures of thoracic fluid should be performed.

Some febrile coughing horses have no abnormalities on auscultation, percussion, thoracic radiography or ultrasound. In such patients, occult pulmonary disease may be present and TTA/BAL and culture of TTA are indicated. Alternatively, such horses may have upper airway disease and an endoscopic evaluation is indicated.

Cough without fever
When auscultation of the thorax demonstrates primarily expiratory crackles and wheezes, percussion often reveals a caudoventral expansion of the lung. These findings suggest that recurrent airway obstruction (RAO; formerly COPD) may be present. Thoracic radiographs usually show increased interstitial densities; radiographs are useful to rule out occult underlying pulmonary disease, but are often not required for diagnosis. TTA and BAL are indicated. Horses with RAO usually have an increase in PMNs in BAL and TTA fluids. Growth of pathogens in TTA fluid identifies secondary bacterial infection. Occasionally, TTA/BAL fluids may contain parasite larvae or many eosinophils: Dictyocaulis arnfieldi infestation in horses housed with donkeys/mules - direct cytological evaluation of unfixed, unstained, iodine-stained mucus. Coughing horses younger than 18 months of age with eosinophilic TTA may be experiencing migration of Parascaris equorum larvae. A Baermann flotation should be performed on faeces, but the test may not demonstrate ascarid larvae, because pulmonary migration may occur early in the prepatent period. Diagnosis is based on ruling out other causes of pneumonia.

When TTA/BAL fluids have no abnormal cells, cultures still should be assessed. For afebrile coughing horses with auscultation findings of inspiratory crackles and wheezes and cardiac murmur or arrhythmia, one should take thoracic radiographs. Diffuse pulmonary infiltrates in a bronchoalveolar pattern suggest pulmonary oedema: ultrasonographic evaluation of the heart is indicated. Some coughing, afebrile horses have no abnormalities on auscultation or percussion: endoscopy of the upper airway and trachea is indicated. Some horses have endoscopic evidence of exudates in the trachea and likely have low grade RAO. The clinician should perform TTA/BAL testing followed by culture of TTA and take thoracic radiographs if possible. In other patients, cough may be a symptom of upper airway obstructive disease (DDSP, rostral displacement of the palatopharyngeal arch, arytenoepiglottic fold entrapment, subepiglottic cyst, arytenoid chondritis/chondrosis, laryngeal hemiplegia or tracheal stenosis, collapse, or partial obstruction) or maxillary or frontal sinustis with discharge into the nasal passages or laryngeal/pharyngeal paresis. The latter may be a symptom of guttural pouch mycosis, empyema, a systemic disease (botulism) or of a trachea foreign body. One should suspect horses with cough but no abnormalities on endoscopic examination of having low-grade RAO.

Cough after exercise or feeding needs an endoscopic evaluation. Haemorrhage in the trachea after exercise indicates that exercise-induced pulmonary haemorrhage is likely (BAL/TTA: haemosiderin-laden macrophages). Thoracic radiographs may show interstitial densities in the caudodorsal lung field. Postprandial cough may be associated with soft palate paresis, DDSP, cleft palate or dysphagia of any cause.