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PLEUROPNEUMONIA OR TRAVEL SICKNESS

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Pleuropneumonia, sometimes referred to as pleuritis or infectious pleural effusion is a condition that often occurs in response to transport. The disorder is initiated by a failure of pulmonary defence mechanisms, usually the result of confinement and head elevation. This results in bacterial pneumonia in response to contamination of the lower airways by oropharyngeal microflora. This pneumonia may become sufficiently severe to result in organisms gaining access to the pleural space - pleuropneumonia. This infectious process results in production of large volumes of fluid (exudate) in the thoracic cavity.

Stress, especially transport (also surgery, exercise, etc.) is often an integral part of the history of horses afflicted with this disorder. Less common causes of infectious pleural effusion include blunt trauma to (with or without foreign-body penetration of) the thoracic cavity. In many cases where fluid is present in the thorax, careful clinical evaluation is required to determine its presence. Aggressive therapy is required in order to limit the progression of this serious, life threatening disease.

History and presenting signs

Signs of depression, inappetence, and a prior history of stress, particularly transport or surgery/anaesthesia is common. A history of what appeared to be a bout of 'viral' respiratory tract infection is often reported. Reluctance to move, sweating, and apparent anxiety are features of this disorder. In chronic cases, weight loss and ventral oedema may be noted.

Clinical findings and diagnosis

Increases in respiratory rate, heart rate, dyspnea, fever, mucopurulent nasal discharge, signs of depression, and inappetence are all common features of this disease. In athletic horses, poor performance (acute onset) may be noted, as are signs of distress after racing or training. At rest, a variable degree of dyspnea may be present, and the respiration is often shallow and rapid. Respirations often appear to be painful, and affected horses may "grunt" when required to move. The gait is often stiff due to pain (pleurodynia), because the parietal pleura are well endowed with pain sensing fibers. Care must be exercised not to mistake these signs as being indicative of laminitis, myopathy, or colic. There is usually an elevated heart rate and increased rectal temperature. A soft cough, mucopurulent nasal discharge, and fetid breath are common. On auscultation of the chest, there may be abnormal lung sounds in the dorsal regions, such as wheezes, crackles, rales, and harshness, with muffled or absent sounds in the ventral regions. Care should be taken when considering application of a rebreathing bag as this may cause extreme discomfort in affected horses. Inappetence may not be a common feature in horses with pleuropneumonia.

Pleural friction rubs may be detectable. In addition to auscultation, percussion of the chest can be a useful and inexpensive means for establishing the presence of pleural effusion. Thoracic ultrasonography is now regarded as the technique of choice for determination of pleural and superficial lung pathology and the presence of fluid/fibrin etc in the pleural space. Radiography may also add to the diagnostic arsenal.

In any horse suspected of having a pleural effusion, thoracocentesis should always be performed (on both sides of the chest). Ultrasound examination will greatly assist in appropriate placement of the needle or cannula. Cytologic and bacteriologic examination of this fluid is imperative. In addition, definitive diagnosis of pneumonia is obtained with the use of tracheal lavage/aspiration. This procedure allows for cytologic and bacteriologic analysis of samples collected. Appropriate antibiotic selection can then be made on the basis of culture and sensitivity results.
Bronchoalveolar lavage also may provide a very useful indication of the cytologic but not bacteriologic (due to the potential for contamination by bacteria resident in the upper airway when the tube is passed) characteristics of the airway in the caudal lung region. As this procedure may induce paroxysmal coughing which may be very painful for the horse we tend to use tracheal washing as the technique of choice.

The most common aerobic bacterial species involved in the induction of pneumonia in horses are members of the families Lactobacillaceae (gram-positive) and Enterobacteriaceae (gram-negative). The most frequently isolated bacteria from cases of pleuropneumonia include Streptococcus spp., Actinobacillus spp., Klebsiella spp. Anaerobic bacteria are also implicated commonly as the causative agents in bacterial (pleuropneumonia). As a result, submission of samples for anaerobic culture, particularly in cases with severe clinical manifestations, may be indicated.

Hematology will give some guide to the severity of the infection in acute cases. Anticipated abnormalities include a leukocytosis, with neutrophilia, and increased serum fibrinogen and globulin concentrations if the disease process has been active for more than a few days.

If pleuritis and pleural effusion have been present for more than 1 to 2 weeks, there may be evidence of weight loss, ventral oedema (particularly in the pectoral region), and a history of intermittent pyrexia.

**Differential diagnoses**

- Viral pneumonia
- Bacterial pneumonia, without extension to the pleural space
- Chronic obstructive pulmonary disease (COPD - Heaves)
- Thoracic neoplasia with effusion
- Conditions causing signs of generalized pain (e.g., laminitis, colic, myopathy)
- Thoracic trauma or foreign body
- Severe exercise-induced pulmonary hemorrhage
- Pulmonary edema
- Cardiac failure (eg pericardial disease, myocarditis)

**Treatment**

Thoracic drainage to aspirate fluid and necrotic material from the chest is essential in most cases, particularly if more than a few liters of fluid are in the thoracic cavity. This may be done with a catheter, teat cannula or small gauge chest tube if the volume of fluid is small and the fluid contains little fibrinous material.

When there is a large volume of flocculent fluid, it should be drained with a relatively large bore chest tube (20-28F blunt-tipped chest tube). Fluid is allowed to drain via gravity (suction is contraindicated because as it aspirates flocculent material into the tube, thereby blocking the lumen). Tubes may be fixed in place with a purse-string suture or 'Chinese finger tie', and a one-way valve can be made from a latex condom with the tip cut off that is taped to the end of the tube. If the volume of fluid is not thought to be too great, intermittent drainage may be considered.

Parenteral antibiotics are integral to the treatment of these cases. It is important that if possible bacteriocidal rather than bacteriostatic antibiotics are used. Once samples have been collected (ideally this will include fluid from both thoracic cavities and from a transtracheal aspirate), empirical antimicrobial therapy should be commenced until culture and sensitivity results are available. A beta-lactam antibiotic (eg, penicillin G or ceftiofur) and aminoglycoside antibiotics (gentamicin or amikacin) are usually the drugs of choice in pleuropneumonia because they (1) are active against the vast majority of organisms encountered in this disease, (2) are bacteriocidal, (3) provide good plasma and tissue concentrations, (4) have a reasonably broad therapeutic index, and (5) are relatively cost-effective.
Since many cases will have anaerobic bacteria involved, the use of metronidazole (10-15 mg/kg PO q6h) should be strongly considered if the culture results indicate penicillin-resistant B. fragilis. The most commonly isolated anaerobic organisms include Bacteroides spp. and Clostridium spp. Mixed aerobic and anaerobic infections are common and the presence of anaerobes does not necessarily indicate a poorer prognosis for survival.

Anti-inflammatory therapy may be considered in an attempt to limit the degree of debility inflicted by the disease. A number of agents are readily available. Examples include flunixin meglumine, phenylbutazone, and ketoprofen. Care should be exercised in horses with associated dehydration because the nephrotoxic potential of these agents is increased. It must also be noted that anti-inflammatory drugs may mask fever thereby decreasing the clinician's ability to monitor progress.

In cases where significant systemic manifestations of the disease exist (e.g., toxemia, dehydration, etc.), fluid therapy is also indicated. The degree of volume contraction is reflected by physical findings (e.g., skin turgor, mucous membrane color, and capillary refill time) and appropriate clinicopathologic measurements (e.g., PCV, TPP, urea, creatinine).

Following initial replacement of deficits, oral fluid supplementation will usually cover ongoing losses.

Good nursing care is also vital in the management of pleuropneumonia. This includes limitation of stress, provision of a highly palatable and digestible diet, and constant surveillance for such complications as lung abscessation, anterior thoracic masses/abscesses, pulmonary infarction, bronchopleural fistulas, pericardial effusion, pneumothorax, and laminitis.

In acute cases with limited effusion, the prognosis for full recovery is likely to be reasonable if appropriate aggressive therapy is undertaken. Survival rates of horses suffering from pleuropneumonia range between 60 to 90% following appropriate treatment. However, in long-standing or complicated cases that have significant sequelae, the degree of damage to the contents of the thoracic cavity is often quite severe. Although salvage in many cases is possible if aggressive therapy is maintained for appropriate periods, prognosis for return to a successful athletic career must remain much more guarded.

The techniques of standing thoracotomy/rib resection have been described and advocated as a treatment for chronic cases of pleuropneumonia which have proven un-responsive to antimicrobial therapy and pleural drainage. Open thoracic drainage can also be attempted in cases of pulmonary abscessation and bronchopleural fistulas.

Repeated thoracic ultrasonography should be an integral part of the management of horses with pleuropneumonia. It is a readily accessible non-invasive diagnostic tool which can provide valuable information pertaining to response to treatment and development of sequelae.