**Diseases of the Respiratory System**

**ASPIRATION PNEUMONIA**

**Assistant Professor** **Dr. Hayder Badri Abboud**

**B.V.M.&S.,M.S.V.M.&S.,Ph.D.**

* **Aspiration or inhalation pneumonia is a common and serious disease of farm animals.**

**CAUSES**

**- Cases occur after careless drenching or passage of a stomach tube during treatment for other illness, for example administration of mineral oil to horses with colic. Even when care is taken these procedures are not without risk.**

**- Other causes include the feeding of calves and pigs on fluid feeds in inadequate troughing, inhalation occurring in the struggle for food.**

**- Dipping of sheep and cattle when they are weak, or keeping their heads under for too long, also results in inhalation of fluid.   
- Vomiting in ruminants and horses may be followed by aspiration, especially in cattle with parturient paresis or during the passage of a stomach tube if the head is held high  
- Rupture of a pharyngeal abscess during palpation of the pharynx or passage of a nasal tube may cause sudden aspiration of infective material.   
- Animals suffering from paralysis or obstruction of the larynx, pharynx, or esophagus may aspirate food or water when attempting to swallow.  
- Aspiration pneumonia is the consistent lesion of crude oil poisoning in cattle and probably results from vomiting or regurgitation.**

**Lipid pneumonia  
- Lipid pneumonia usually results from aspiration of mineral oil (liquid paraffin) administered for gastrointestinal disease.  
- Pneumonia is sometimes the result of unintentional administration of the oil into the trachea through a misplaced stomach tube, or inhalation following oral administration of oil.  
- However, aspiration of oil can occur even when it is delivered into the stomach through a nasogastric tube,   
presumably because of regurgitation of oil either around the tube or after the tube has been removed.**

**- Administration of oil to sedated or severely depressed animals may increase the risk of aspiration.**

**-Clinical signs include cough, tachypnea, tachycardia, pyrexia, respiratory distress and abnormal lung sounds.**

**-Radiographs can reveal an alveolar and interstitial pattern - Examination of tracheal aspirates reveals a neutrophilic inflammation and the presence of lipid. Lipid can be readily identified by Sudan or oil red 0 of smears of the aspirate in acute cases.  
- Necropsy examination reveals consolidated lungs.  
 - On cut section of these areas oil can be visible.   
- Chronic cases have tissue necrosis and severe interstitial pneumonia.  
- Lipid droplets can be identified in affected lung tissue after oil red 0 staining of sections.  
-The presence and nature of the lipid can be demonstrated by thin layer chromatography and gas chromatography.**

**-The prognosis for recovery is poor.  
- Treatment is supportive and includes anti-inflammatory drugs antimicrobials, and oxygen.  
- There is no specific treatment.  
- Prevention includes careful insertion of nasogastric tubes, verification of their placement in the stomach and not administering mineral oil to animals with a distended stomach or ones that are heavily sedated or severely depressed.  
 Esophageal obstruction  
- Esophageal obstruction is a common and important cause of pneumonia in horses.  
- Of 18 horses with esophageal obstruction that had thoracic radiographs performed, eight had evidence of aspiration pneumonia.**

**- Obstruction of the esophagus in horses, and in other scies, leads to the accumulation of saliva and feed material in the esophagus oral to the obstruction.  
- When the esophagus is full, this material accumulates in the pharynx with subsequent aspiration into the trachea resulting in contamination of the trachea and lower airways with feed material and oropharyngeal bacteria.  
- Feed material is irritant and also causes obstruction of the smaller airways.  
- Pulmonary defense mechanisms are weakened or overwhelmed by the contamination and infection and pneumonia result.  
 - The duration of esophageal obstruction is a good indicator of the risk of aspiration pneumonia, although the extent of contamination of the trachea with feed material is not.   
  
CLINICAL FINDINGS  
- Affected horses pyrexic, tachycardic, and toxemic. Lung can include crackles and wheezes, but the only auscultatory abnormality can be decreased breath sounds in the ventral thorax.   
- Radiography reveals a characteristic pattern of bronchopneumoni restricted, at least initially, to the cranio-ventral and caudo-ventral lung lobes in adult horses. Ultrasonography reveals comet tail lesions in the ventral lung fields and variable consolidation.  
- Pleuritis is a not uncommon sequel to aspiration of pneumonia.   
- Examination of tracheal aspirates demonstrates neutrophilic are both inflammation with presence of degenerate neutrophils, bacteria that are both intracellular and extracellular, and plant material.**

**- Culture of tracheal aspirates yields one or more of a wide variety of including *S. zooepidemicus,Pasteurella sp., Actinobacillus sp, E. coli*, and anaerobes.   
- Treatment involves prompt relief of the esophageal obstruction and administration of broad-spectrum anti­  
microbials such as a combination of penicillin, aminoglycoside, and metronidazole.  
- The prognosis for recovery from aspiration pneumonia secondary to esophageal obstruction is guarded to fair, partly because the animal has to recover from two diseases the pneumonia and the esophageal obstruction. - Prevention of aspiration pneumonia in horses with esophageal obstruction includes prompt relief of the obstruction and administration of broad -spectrum antimicrobials.**

**Meconium aspiration syndrome  
- Aspiration of meconium during parturition is associated with severe lung disease in newborns.  
- Passage of meconium in utero, and subsequent aspiration by the fetus, is a sign of fetal distress.   
- It is suggested that fetal distress results in expulsion of meconium into the amniotic fluid.  
- This is followed by aspiration of contaminated amniotic fluid.  
- The passage of meconium­contaminated amniotic fluid into the lungs may occur prior to birth when the fetus gasps for air in an attempt to correct hypoxemia or when the calf takes its first breath and aspirates meconium from the oropharynx.**

**- Normally, fetal aspiration of amniotic fluid does not occur because the inspiratory forces are insufficient to allow amniotic fluid to reach the lungs, and the lung liquid, a locally produced viscous material present in the trachea and lungs, constantly flows up the major airwa to the oropharynx.   
- The result is that the fetus is doubly challenged in that it must deal with both the cause of the fetal distress and the pneumonia induced by aspiration of meconium.  
- Although meconium is sterile, it induces a severe inflammatory response in the lungs.  
- The meconium aspiration syndrome is best described in newborn calves, although there are numerous reports of its experimental induction in piglets and lambs as a model of the human disease.**

**- In a series of calves under 2 weeks of age submitted to  
a diagnostic laboratory, 42.5% had evidence of meconium, squamous cells or keratin in the lung.  
- Diffuse alveolitis with exudation of neutrophils, macrophages,multinucleated cells and obstruction of small airways with atelectasis were cornmon.  
- Treatment of aspiration pneumonia in farm animals is not well described.  
- Administration of antimicrobials is practical.  
- Anti-inflammatory drugs are indicated.   
- Pentoxifylline is used in human neonates with meconium aspiration, but there are no reports of its use for this purpose in farm animals.**

**Dusty feed  
- Although farm animals fed on dusty feeds inhale many dust particles and bacteria, which can be readily isolated from the lung, this form of infection rarely results in the development of pneumonia.   
- Much of the dust is filtered out in the bronchial tree and does not reach the alveoli.   
- However, this may be of importance in the production of the primary bronchiolitis that so often precedes alveolar emphysema in horses.  
- The inhalation of feed particles in pigs in a very poorly ventilated environment has been demonstrated to cause foreign body pneumonia.**

**- Also, a dry, dusty atmosphere can be created in a piggery by over frequent changing of wood shavings used as bedding, and this can lead to the production of foreign body pneumonia.  
- Liquids and droplets penetrate to the depths of the alveoli and run freely into the dependent portions, and aspiration pneumonia often results.**

**References**

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