University of Mosul
Lecture No.: 2
College of Veterinary Medicine
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Unit of Scientific Affairs
Website:

Lecture title: **Techniques for advanced evaluation of the respiratory system**

Lecturer Affiliation: Department of Internal & Preventive Medicine

Summary:

1. Auscultation and percussion of the thorax
2. Endoscopy of the upper airways, guttural pouch (in Equidae), trachea, bronchi, and larger bronchioles
3. Invasive endoscopic examination of the sinuses using rigid endoscopes
4. Pleuroscopy using either rigid or flexible endoscopes
5. Radiographic examination of the skull, pharynx, larynx, guttural pouch (in Equidae), trachea, and thorax
6. Computed tomographic and magnetic resonance imaging
7. Scintigraphic examination of respiratory function
8. Ultrasonographic examination of the soft tissue of the pharynx and larynx, and thorax
9. Collection and evaluation of the respiratory tract secretions
10. Pulmonary function testing, including measurement of tidal and minute volumes, pleural pressure, forced expiratory volume, flow volume loops, forced oscillometry, and CO2 breathing
11. Arterial blood gas analysis
12. Venous blood gas analysis
13. Blood lactate concentration
14. Pulse oximetry
15. Collection and analysis of exhaled breath condensate
16. Lung biopsy
17. Respiratory sound spectrum analysis
18. Exercise testing

Principles of Treatment:

Lower Respiratory Tract Diseases:

1. Ensure adequate oxygenation of blood and excretion of carbon dioxide
2. Relieve pulmonary inflammation
3. Effectively treat infectious causes of respiratory disease

4. Relieve bronchoconstriction
5. Provide supportive care to minimize demands for respiratory gas transport

Line treatment of respiratory diseases :

1. Oxygen Therapy:
    a) Nasal insufflation: intranasal catheters, Unilateral administration of oxygen at flow rate of 50 mL O2 per kg body weight per minute
    b) Transtracheal oxygen delivery system: A catheter is inserted into the midcervical trachea and directly distally in the tracheal lumen for approximately 25 cm
2. Respiratory Stimulants :
    a) Including doxapram, theophylline, caffeine, and amphetamine sulfate…,
    b) Advocated in animals with hypoxemia resulting from respiratory disease
3. Mechanical Ventilation :
    a) Short-term mechanical ventilation can be achieved in neonates and small adults by use of a nasotracheal tube and a hand-operated bellows, which is usually in the form of a resilient bag equipped with a one-way valve
    b) Commercial bags (Ambubag) are available in a variety of sizes suitable for neonates and small ruminants
4. Anti-Inflammatory Therapy:
    a) Nonsteroidal anti-inflammatory drugs : Meloxicam (0.5 mg/kg subcutaneously, once)
    b) Glucocorticoids :
5. Immunomodulators : Interferon 50 to 150 IU of interferon-alpha administered orally once daily for 5 days
6. Antimicrobial Therapy :
7. Bronchodilator Drugs :
    a) beta-2- agonists (clenbuterol, albuterol/salbutamol, terbutaline)
    b) parasympatholytic drugs (ipratropium, atropine)
    c) methylxanthines (aminophylline, theophylline)
8. Mucolytics, Mucokinetic, and Antitussive Drugs :
    - Mucokinetic agents have been divided into six groups according to

their mode of action:

a) Diluents, surface acting agents, and mucolytics are supposed to reduce the viscosity of the respiratory secretions.
b) Bronchomucotropic agents, formerly called expectorants, are supposed to increase the production of a less viscous mucus.
c) Betaadrenergic agonists and methylxanthine derivatives, promote more effective clearance of mucus and act as ciliary augmentors or bronchodilators.

Control of Respiratory Disease:

1) Minimizing exposure to inciting agents (infectious or physical)
2) Maximizing innate resistance by ensuring that the animals are in excellent general health through attention to nutrition, housing, and animal welfare
3) Maximizing adaptive resistance by the administration of effective vaccines such that maximal resistance is produced to coincide with the time of greatest risk of the disease