



Bacterial Causes of Respiratory Tract Infections in Rabbits

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Abstract

Respiratory infections in rabbits caused by the interaction of insufficient care conditions, pathogenic factors and anatomical disadvantages can lead to death if left untreated. Bacterial infections have been reported to cause abscesses in subcutaneous tissues and other sites, torticollis and infections resulting in inner ear infection and septicemia. The most frequently isolated bacterial agents in respiratory system infections of rabbits are *Pasteurella multocida*, *Bordetella bronchiseptica* and *Staphylococcus aureus*. Today, it has become clear that it is important to keep rabbits commercially or as pets. For this reason, it is a great advantage to know the respiratory system diseases and their agents in rabbits, and to take precautions and appropriate treatment methods against these factors. Epidemiological studies are extremely important to highlight the occurrence of disease in animals and to assist in the implementation of preventive control procedures. In this text, it is aimed to emphasize the bacterial diseases of the respiratory tract.

Keywords: Respiratory Tract; Rabbit; Epiglottis

Introduction

Respiratory tract infections, which are the most common in rabbits after gastroenteric diseases and progress with high morbidity, can cause death if left untreated [1]. Rabbits necessarily only breathe through the nose because their epiglottis is located rostrally on the soft palate. Any obstruction in the nasal cavity causes wheezing [2]. Respiratory diseases in rabbits are divided into upper respiratory tract infections with a mild course and chronic mucopurulent discharge and lower respiratory tract infections that can cause an acute or subacute bronchopneumonia leading to high mortality [3]. The most frequently isolated agent in respiratory system infections of rabbits is *Pasteurella multocida*. Because *Pasteurella* species are found in the normal flora of the upper respiratory tract, the demonstration of *Pasteurella* alone without a pathological or immunological response in the host does not indicate infection. Inadequate housing conditions and malnutrition may predispose to pasteurellosis. It has been reported that the main modes of transmission are

direct contact, airborne spread and fomites [4]. The second most common isolate from rabbits with upper respiratory tract disease is *Bordetella bronchiseptica*. Other common isolates isolated from upper respiratory tract infections are *Pseudomonas spp.* and *Staphylococcus aureus*. *Moraxella catarrhalis* and *Mycoplasma spp.* Factors such as *Escherichia coli*, *Chlamydia*, *Mycobacterium*, *Pneumocystis oryctolagi* play a role in lower respiratory tract infections [5].

Bacterial Causes

Pasteurella multocida

Pasteurella multocida is a gram negative, facultative anaerobic, non-spore forming pleomorphic coccobacillus, commensal bacterium [6]. Transmission occurs by direct contact, inhalation, sexual and hematogenous routes. In rabbits, upper respiratory tract disease, pneumonia, otitis media, pyometra, orchitis, subcutaneous abscesses, conjunctivitis and septicemia are among the symptoms of *P. multocida* infection

[7]. Pneumonia in rabbits is difficult to diagnose. The clinical signs may not be complete and may be limited to a deep cough that sounds like a sneeze or a dog's barking. In other cases, rabbits have a runny nose, lethargy, and decreased appetite. In the progressive form of the disease, rabbits start to breathe with their mouths and fever is seen. Bacteria infecting the rabbit's respiratory tract can spread to other parts of the body or organ, causing conjunctivitis, torticollis, middle ear infection, pleuritis, pericarditis, pyometra, or abscess in the testis. If the infecting bacteria enters the bloodstream, it can lead to fatal septicemia [8].

Bordetella Bronchiseptica

Bordetella bronchiseptica is a gram-negative bacterium that can be found in the respiratory tract of hosts, which includes many mammal species including mice, rats, guinea pigs, rabbits, cats, dogs, pigs, sheep, horses and bears [9,10].

In rabbits, there is an opposite relationship between *B. bronchiseptica* and *P. multocida*: weaning rabbits have higher rates of infection with *B. bronchiseptica*, while *P. multocida* infection is usually predominant in adults. *Bordetella bronchiseptica* can cause upper respiratory tract infection in rabbits and guinea pigs. Infected rabbits have mild symptoms such as sneezing, lacrimation, and runny nose, while drowsiness, difficulty breathing, loss of appetite, and sudden death have been reported in guinea pigs [1,11].

Staphylococcus Aureus

Staphylococcus aureus is a Gram-positive cocci-shaped bacterium that can be seen as a bunch of grapes when examined under light microscope after gram staining [12]. It is one of the important pathogens that cause diseases in humans and animals. It causes severe respiratory infections in rabbits and is not well characterized. *S. aureus* infections have been reported to cause widespread subcutaneous abscesses, lung and heart abscesses, as well as conjunctivitis, rhinitis, and fibrinous pneumonia in adult animals [13].

Other Bacterial Agents

Bacteria such as *Pseudomonas spp*, *Staphylococcus aureus*, *Moraxella catarrhalis*, *Mycoplasma spp*, *Escherichia coli*, *Pneumocystis oryctolagi* and *Chlamydomphila* have been reported to be among other potential bacteria causing respiratory tract infections in rabbits [5].

Treatment

In respiratory system infections, sick animals with severe dyspnea and mouth breathing should be treated urgently.

Patients should be separated from healthy animals and taken into a quiet and dark environment. Antibiotics, mucolytics, bronchodilators and NSAIDs group drugs are used in the treatment. Antibiotic selection should be based on culture and sensitivity, and bactericidal drugs should be preferred. In general, 14 days of antibiotic treatment is used, but this period can be extended up to 3 months in severe infections [5]. Fluoroquinolones, penicillins, chloramphenicol, gentamicin and tetracyclines have been reported to be effective in treatment. It has been reported that the use of enrofloxacin (5 mg / kg SC q12h) for 14 days eliminated the disease [14]. Ciprofloxacin (20 mg/kg PO q24h) for 5 days has been reported to be effective in *P. multocida* infections [15]. Apart from these, penicillin G benzathine/penicillin G procain (40,000 IU/kg SC q24h x 2 week) has been reported to be effective in cases of Pasteurellosis [16].

Prevention

Hygiene conditions must be at the maximum level to prevent the spread of the disease to other animals. Cages should always have clean water and fresh water. Cage size should be large enough to meet the running needs of rabbits. Animals should not be housed in overcrowded cages. Sick animals should be kept in quarantine in an area separate from intact animals. It should be kept in mind that rabbits are inactive during the day and active active at night. They need to be careful and not go anywhere. Rabbits' shelter areas should be built to prevent the contact of wild rodents. Appropriate ration should be prepared and feeding should be done.

Conclusion

Respiratory system infections caused by anatomical disadvantage, inadequate care conditions and microorganism interaction are frequently seen in rabbits and progress with a high morbidity/mortality rate. In addition to causing economic loss in rabbit breeding, respiratory system infections can also affect research results in experimental medicine applications. For this reason, it is important to know the systemic infectious agents and to determine the precautions to be taken against these agents. It is also a different perspective that should be considered in order to raise healthy animals and put them at the service of humanity.

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