ANTIBIOGRAM OF BACTERIA THAT CAUSE PNEUMONIA IN SOME BREEDS OF DOGS

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Abstract

The primary purpose of our study is to examine the most common bacterial causes that cause pneumonia in dogs and make an antibiogram of the bacteria most commonly found in our study. In this study, 26 nasal samples were collected using sterile swabs from the canine clinical cases. Clinical signs included coughing, nasal discharge, sneezing, difficulty in breathing, fever, loss of appetite and lethargic behavior. Nasal swabs were immediately transferred, aseptically, into a nutrient broth and were subjected to various cultural tests and microscopic examination. The sensitivity of the antibiotics is determined by measuring the area of inhibition. From our examination and our results, it can be concluded that the most commonly isolated bacteria that cause pneumonia in dogs are the following bacteria: *Streptococcus zooepidermicus, Pasteurela multocida, Bordetella bronchiseptica, and Klebsiella pneumonia.*

Key words: *Dogs, Pneumoniae, Bacterial causes, Labrador Retriever, German Shepherd and Poodle.*

Introduction

Bacterial pneumonia involves diseases from acute to chronic, unilobar vs multilobar with a alveolar and/or bronchial injury and inflammation, which can go from a clinically silent to fatal infection. *(Dos Santos, 2017).* It remains one of the most common clinical diagnosis in dogs. *(Dear, 2014).* On the other side in cats, bacterial pneumonia is less commonly identified than inflammatory feline bronchial disease which has a higher prevalence in this specie *(Foster et al., 2004).*

In the canine species, there are no sex, breed or age predisposition noted to almost all forms of pneumonia, but young animals presents more commonly primary viral infection followed by a bacterial infection, *(Griego et al., 1995).* While adult animals present frequently bacterial infection due to aspiration, immuno (ex. Irish wolfhound, Great Dane, German shepherd dog, Labrador retriever), and the English bulldog are predisposed to aspiration pneumonia *(Dos Santos, 2017).*

There is no breed predisposition for feline infectious pneumonia as well *(Addie et al., 2009).* A male predisposition is noted, two and a half times superior than female. Interestingly, in another study on fatal feline herpesvirus type I associated pneumonia, where all the cases were male *(Berger et al., 2015).*

Dogs with either acute or chronic respiratory disease are very commonly clinically diagnosed with bacterial pneumonia. With the presence of clinical signs and a physical exam highly compatible with a pneumo or bronchopneumonia, the clinician should confirm the presence of bacteria and its pathogenicity *(Cohn et al., 2004).*

Material and Methods

Sample collection

Samples were collected from Bitola region. A totally 26 samples were taken from different age of dog breeds Labrador Retriever, German Shepherd and Poodle. Nasal swabs were immediately transferred, aseptically, into a nutrient broth. And were subjected to various cultural tests and microscopic examination *(Akter et al 2013).*

Isolation and Identification of bacteria

Nasal swabs were immediately transferred, aseptically, into a nutrient broth and were subjected to various cultural tests and microscopic examination. The swabs were then processed for isolation of bacteria and antibiotic sensitive test *(Abera et al., 2014).*

Materials used

For this study different medium Nutrient broth, Nutrient agar, MacConkey agar, Mannitol salt and Müller-Shinton agar.

Antibiotic sensitivity test

This method is also called the agar diffusion method or the disk diffusion method *(Cauwelier et al., 2004).* The procedure followed is simply that a filter disk impregnated with an antibiotic is applied to the surface of an agar plate containing the organism to be tested and the plate is incubated at 37°C for 24-48 hours.

Table 1. Antibiotics used for determination of the antibiogram of *Streptococcus zooepidemicus*

Antibiotic	Disk Conc	Antibiotic	Disk Conc	Antibiotic	Disk Conc
1. Penicillin	10 µg	3. Streptomycin	10 µg	5. Rifampicin	10 µg
2. Amoxicillin	30 µg	4. Methicillin	5 µg		

Results and Discussion

Table 2. Bacteria commonly isolated from airway samples of canine patients with infectious pneumonia

Organism	
Streptococcus zooepidermicus	12
Pasteurela multocida	7
Bordetella bronchiseptica	4
Klebsiella pneumonia	3

From the results presented in the table 2 of the 26 the microbiological tests taken, 4 species of bacteria were detected *Streptococcus zooepidermicus, Pasteurela multocida, Bordetella*

bronchiseptica, Klebsiella pneumonia, most of the bacteria are detected by the species *Streptococcus zooepidermicus.*

Streptococcus zooepidemicus is a Gram-positive, beta-haemolytic bacteria. *(Gruszynski et al.,2015).* Historically associated with opportunistic infections, predominantly in the reproductive tract in horses and with lymphadenitis in guinea pigs. In recent years the bacterium has emerged as a significant cause of pneumonia in dogs, notably those housed in kennels or rehoming centres, and particularly racing greyhounds *(Arsevska et al., 2017).*

Infection is usually sporadic, but can result in severe, and not infrequently fatal, pneumonia. The source of infection is usually unknown but presumed to be introduced by a carrier animal *(Bell, 2008).* Although transmission from horses to dogs may occur, it is now thought that transmission occurs mainly directly between dogs *(Parrish et al., 2014).* Or those with a weakened immune response due to concurrent respiratory viral infection appear to be most severely affected *(Vieson et al., 2012).* The bacterium produces various exotoxins and the most serious disease manifestations are believed to result from the animal's immune response to these so-called 'superantigens', resulting in a 'cytokine storm', similar to toxic shock syndrome in humans. *(Arsevska et al., 2017).* The bacterium is, as the name implies, zoonotic and has been isolated from a wide range of different species including humans where it has been linked, albeit rarely, with severe infections, in at least one case this has been linked directly back to contact with a dog with pneumonia.

Table 3. Results from the made antibiogram

	Streptococcus zooepidermicus		**Aerobic gram negative**
Antibiotic	Sensitive Isolates (%)	Intermediate Isolates (%)	Resistant isolates (%)
Penicillin	15	64	7
Amoxicillin	100	17	0
Streptomycin	61	16	18
Methicillin	0	44	45
Ritampicn	73	20	0

From the results presented in Table 3, it can be seen that only an antibiogram of *Streptococcus zooepidemicus* has been made and the results show that certain antibiotics such as Penicillin and Methicillin do not affect the bacteria while other antibiotics can act on the bacterium.

Conclusion

From the results it can be said that the bacterial strain of pneumonia in dogs, before taking treatment, is to take sterile swabs to isolate the cause and then to make an antibiogram. In our microbiological study, a greater percentage of *Streptococcus zooepidemicus* strains were detected. If the infection in dogs is caused by the *Streptococcus zooepidermicus* strain it is advisable to use the following antibiotics Amoxicillin, Ritampicn and Streptomycin which according to our studies give good results in the treatment of dogs.

Recommendations:

- Keep your dog with pneumonia away from all other pets.
- "Clean all toys, bedding and bowls that your sick pet may have contaminated." Tell your dog walker they have the next one or two weeks off so your dog can rest.
- The chance of your dog developing bacterial pneumonia is reduced by regularly vaccinating your dog to help prevent infections that can lead to pneumonia.
- Regular annual exams with your vet also serve to keep your pet healthy and prevent the early onset of diseases.

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