Oral Presentation (SA-15)

Antibiotic Resistance Microbial Infection in Five Dogs in Bali

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INTRODUCTION

Antimicrobial Resistance is a global public health problem that is influenced by the use of antimicrobial agents in humans, animals and elsewhere. Abuse of antibiotics has increased the prevalence of human and animal microbioma resistance genes over the last 75 years (Pal et al, 2016). Antibiotic resistance occurs when bacteria are able to reduce or eliminate the effectiveness of drugs, chemicals or other agents designed to cure or prevent infection. Thus bacteria survive and continue to multiply causing more harm (Bisht et al 2009). A strain is resistant against an antibiotic if its minimal inhibitory concentration (MIC) is higher than for the corresponding parental wild-type strain (Martinez et al, 2015; Bengtsson-palme, 2017). As well as humans, pet animal like dogs that have certain medical conditions that are often prescribed antibiotics have a higher risk of infection with antibiotic resistant bacteria. Antibiotic resistance in dog or other pet animal causes very adverse effects such as treatment failure with antibiotics that can cause severe infections, complications, increased mortality. Antibiotic resistance leads to extended treatment time leading to increased medical expenses. Another impact that is considered very dangerous is the zoonotic potential of resistant microbes that can be transmitted to humans. Infections that do not respond to antibiotics appropriately, should be suspected of having an antibiotic resistant microbial infection. Actibiotic sensitivity test is necessary in the selection and use of appropriate antibiotics for therapy.

CASE REPORT

Signalmnet, anamnessis and clinical symptoms

Five dogs of various breeds and ages suffer from various health problems such as otitis media, dermatitis, surgical site infections and systemic infections which can be seen in Table 1. Complete blood count in all dogs indicates a bacterial infection. Cytology tests were performed on dogs with otitis media, dermatitis and surgery site infection that showed high levels of bacterial infection. Infection showed no significant signs of healing despite being treated with antibiotics for about two weeks. Most are adult dogs over the age of two years. Based on the owner's information and the medical history, all the dogs are several times had been prescribed antibiotics before. From anamnesis and clinical symptoms, the dogs are suspected of having a bacterial infection that is resistant to certain antibiotics.

Table 1 Patient Signalment and Diagnose

Name	Sex	Breed	Age (years)	Diagnose
Joker	Male	Cocker spaniel	12	Surgical site infection
Max	Male	Samoyed	8	Systemic bacterial infection and blood parasite infection
Zumo	Male	Goden retriever	10	Otitis media and dermatiis
Cinta	Female	Rottweiler	5	Otitis media
Snoopy	Male	Balinese local dog	2	Otitis media

Antibiotic sensitivity test

Antibiotic sensitivity test is performed to determine the antibiotic resistance and sensitivity of the infectious agent. Antimicrobial sensitivity test was performed in Veterinary Microbiology Laboratory, Faculty of Veterinary Medicine of Udayana University. Samples were taken from ear swabs, nasal swabs and skin swabs. The samples were tested by the diffusion method (Kirby-Bauer test) against several antibiotics including kanamicyn, doxycicline, trimethoprim-sulfamethoxazole, ampicillin, oxytetracycline,

penicillin, streptomicyn, ciprofloxacin and enrofloxacin. The results of the antibiotic sensitivity test show the resistance of several antibiotics tested as shown in Table 2.

Table 2 Antibiotic Sensitivity Test Result

Name	Sensitive	Resistant
Joker	Kanamicyn	Doxycicline, Trimethoprim-Sulfamethoxazole , Ampicillin, Oxytetracicline, Penicillin, Streptomicyn, Ciprofloxacin Enrofloxacin.
Max	Kanamicyn, Trimethoprim-Sulfamethoxazole , Ampicilin.	Doxycicline, Oxytetracicline, Penicillin, Streptomicyn, Ciproflixacin, Enrofloxacin.
Zumo	Kanamisin and Streptomisin	Doxycicline, Trimethoprim-Sulfamethoxazole , Ampicilin, Oxytetracicline, Penicillin, Ciproflixacin, Enrofloxacin.
Cinta	Kanamisin and Streptomisin	Doxycicline, Trimethoprim-Sulfamethoxazole , Ampicilin, Oxytetracicline, Penicillin, Ciproflixacin, Enrofloxacin.
Snoopy	Trimethoprim-Sulfamethoxazole , Ampicilin, Oxytetracicline, Penicillin, Streptomicyn, Ciproflixacin, Enrofloxacin.	Kanamicyn, Doxycicline

Diagnosis and Treatment

Through physical examination, anamnesis is then confirmed by laboratory test, all dogs are diagnosed with bacterial infection with certain antibiotic resistance. Treatment is done by administering antibiotics selected based on antibiotic susceptibility to each dog. Supportive and symptomatic treatment is performed to support the patient's condition during antibiotic treatment. All dogs who get the appropriate antibiotics show a good response to treatment until healed.

DISCUSSION

Failure of antibiotic therapy due to antibiotic resistance in this case causes an inappropriate response to antibiotics therapy, leading to prolonged illness and the patient not showing a significant healing process. Antibiotics can be divided to two groups on the basis of their effect on microbial cells through two main mechanisms, which are either bactericidal or bacteriostatic. Bactericidal antibiotics kill the bacteria and bacteriostatic antibiotics suppress the

growth of bacteria (keep them in the stationary phase of growth) (Bernatova, 2013). The effectiveness of individual antibiotics varies with

the location of the infection, the ability of antibiotics to reach the site of infection, and the ability of bacteria to fight or disable antibiotics. The failure of antibiotics to kill or inhibit bacterial growth indicates a resistance to the antibiotics used.

Resistance is defined as bacteria that are not inhibited by the systemic concentration of agents normally accomplished with normal dose schedules and / or decreases in the minimum inhibitory concentration range. (Bisht, 2009). Bacteria can evade the actions of antibiotics using diverse mechanisms. Such antibiotic resistance may be either intrinsic or acquired. Intrinsic resistance is inherent to all specimens of the species. In such cases, in general, the gene that encodes the intrinsic resistance is chromosomal. However, acquired resistance involves a change in the organism's genetic composition via either mutation in the chromosomal DNA or the acquisition of exogenous DNA (Silva *et al*, 2013).

The use of unsuitable antibiotics such as too short time, inaccurate dosage and inappropriate selection of antibiotics are regarded as factors of antibiotic resistance. In this case the youngest dog, 2 years old, showed the least resistance of the type of antibiotics tested and the oldest 12-year-old dog in this case showed almost all resistance to all antibiotics except Kanamicyn. This indicates that the age factor should also be considered as a risk of antibiotic resistance in dogs.

Antibiotic resistance that occurs in these dogs, administration and replacement of antibiotics according to the bacterial antibiotic sensitivity shows good results. The selection of ideal antibiotics for therapy should be based on the determination of the relevant etiologic agents and antibiotic sensitivity. This indicates that bacterial sensitivity testing is indispensable in antibiotic therapy. The bacterial sensitivity test is able to provide information in choosing the right type of antibiotic so that bacterial infection can be treated immediately. Information obtained through antibiotic sensitivity tests avoid needless, expensive, and potentially dangerous antimicrobial therapy. Empirical care often begins before laboratory microbiological reports are available when treatment should not be delayed

because of the seriousness of the disease.

CONCLUSIONS

Bacterial infection resistant to antibiotics leads to the failure of antibiotic therapy in five dogs that have been examined. Treatment failure is indicated from inappropriate treatment response and prolonged illness. In this case the age of the dog shows different antibiotic resitances. An antibiotic sensitivity test is needed to determine the sensitivity and resistance of antibiotics in order to choose the right antibiotic.

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