

CLINICAL AND MICROBIOLOGICAL ASPECTS IN DOG PERIODONTAL DISEASE

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Abstract. The purpose of this study is the identification of microflora present in the dog oral pathology, establishing connections between it and the clinical manifestations, and to make a correlation between clinical and microbiological aspects and the stages of periodontal disease. During this research 14 cases were diagnosed with periodontal disease: stage I on 3 patients (age of 3 years), stage II on 3 patients (age of 7, 6 years), stage III on 5 patients (age of 7 years) and stage IV on 2 patients (age of 10 years). In the initial stages (I, II) of periodontal disease we found gram positive bacillus arranged in a filament shape and in stages III and IV we encountered the growth of oral cocobacilli G-. The most effective antibiotics in our study is different depending of the stage of periodontal disease and was represented by Amoxiclav and Enroxil for stages I, III and IV, Amoxiclav and Ceftiofur for stage II. The oral microbiota is changing with evolution of periodontal disease, increasing the gram negative cocobacil population, especially *Pseudomonas* spp. Every individual presents a different sensitivity with an specific antibiogram.

Keywords: dog, antibiotic, antibiogram, periodontal disease

INTRODUCTION

Dental problems are the most common cause for medical advice, affecting 80% of dogs over 3 years of age (Daniel T. Carmichael, 2007).

The periodontal disease can be specifically defined as the disease of adjacent tooth tissues (alveolo-dental ligament and dental alveoli), although the name is often used for other oral pathologies (Allan J, 2003). The immune capacities, stress, age, metabolic and nutritional status, race, and endocrine disorders are the factors that can speed or slow the progression of the disease. The severity of lesions increases with aging due to the progressive nature of the disease and is more common and severe in small breeds compared to medium and large breeds (Beckman B. 2008).

The periodontal disease is caused by the accumulation of pathogenic bacterial plaque on the tooth surface. The disorder includes both gingivitis, which is the inflammation of the gingival mucosa around the tooth, and the periodontitis, which is the inflammation and resorption of the alveolar bone (Beckman B.,2008). Among the most frequently encountered bacterial genes are: *Porphyromonas*, *Moraxella*, *Peptostreptococcus* or *Actinomyces* (Davis I.J.,2013).

In its evolution, the condition has five stages depending on the degree of tissue damage. Determining the stage of the disease is done by evaluating the periodontal support tissues for gingivitis, periodontitis, inflammation of the alveolar bone, the alveolar-dental ligament and the cementum (Wiggs R.B., 2012). Periodontal disease causes the resorption of

dental alveoli. The phenomenon can progress vertically, forming angular lesions or horizontally, and can evolve without pockets due to simultaneous gingival retraction (Gorrel C, 2008).

The diagnosis of the oral affections starts with anamnesis (very important are the therapeutic antecedents) and continues with the clinical examination (Colin Harvey, 2006). Examination is done in two stages: extraoral (examination of the head, chewing muscles, base of the ears, salivary glands and local lymph nodes) and intraoral (visualization of the anatomical formations of the oral cavity, possible lesions) (Wiggs R.B., 2012).

The purpose of this study is the identification of microflora present in the dog oral pathology, establishing connections between it and the clinical manifestations, and to make a correlation between clinical and microbiological aspects and the stages of periodontal disease. The results obtained are compared with that found and published by other scientists in scientific literature.

MATERIALS AND METHODS

Biological material: The total number of cases examined between 12.05.2017-16.06.2017 at the Clinic of Medical Pathology, Discipline of Microbiology and Surgery Propedeutic (discipline of the Faculty of Veterinary Medicine Cluj-Napoca) was of 14 dogs, aged 1 year and 13 years. These cases presented oral mucosal disorders, and from anamnesis and symptomatology the diagnosis of periodontal disease was suspected.

The clinical examination of the patients was completed by the paraclinical examinations, which also included the microbiological examination and the antibiogram.

Non-biological material: The scraper Woodpecker UDS-J, manufactured by the Ultrasonic Piezo Scale firm with G1 probe for dental plaque and P1 probe for subgingival tart; Germostop (oral chlorhexidine spray); instrumental dentistry; sterile buffers without medium; culture media used : glucose agar, Muller Hinton agar and blood agar; testing for susceptibility to antibiotics or sulphamides was performed by the antibiogram technique - diffusion method.

RESULTS AND DISCUSSION

During this research 14 cases were diagnosed with periodontal disease: **stage I** on 3 patients with an average age of 3 years, **stage II** on 3 patients with an average age of 7, 6 years, **stage III** on 5 patients with an average age of 7 years and **stage IV** on 2 patients with an average age of 10 years.

We notice the increase in the stage of periodontal disease as the age of the patients increases, if we evaluate the average age of the cases presented. The individual assessment clearly shows a predisposition of individuals to the development of this disease. This aspect has been described in the literature by other researchers (Daniel T. Carmichael, 2007).

Consumption of food in the patients studied was not unitary: 6 patients consumed exclusively dry food, 7 consumed mixed dry and liquid food, and one patient consumed exclusively liquid food.

In our study the germs associated with periodontal disease were of genus *Stafilococcus spp.*, *Neisseria spp.*, *Bacillus spp.*, și *Corynebacterium spp.*, aspect described by Bailie WE (1978). In the initial stages (I, II) of periodontal disease we found more frequent gram positive bacillus arranged in a filament shape and in stages III and IV we

encountered the growth of oral cocobacilli G-, aspect described by D.A. Saphir(1976). With the evolution of periodontal disease, the oral microbial changes, increasing germs of the genus *Streptococcus spp.* și *Pseudomonas spp.*, aspect descris și de *Heidi B. Lobprise (2007)*.

The antibiogram has been able to establish the sensitivity, inter- mediality and resistance phenomena of the microbiota for antibiotics depending on the stage of paradontal disease.

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The antibiogram has been able to establish the sensitivity, inter- mediality and resistance phenomena of the microbiota for antibiotics depending on the stage of paradontal disease. Effective antibiotics for each stage of the periodontal disease are Amoxiclav and Enroxil for the stage I of periodontal disease; Amoxiclav and Ceftiofur or Colistin for the second stage of periodontal disease; Amoxiclav and Enroxil for Stage III and Amoxiclav and Enroxil or Doxycycline for Stage IV.

CONCLUSIONS AND RECOMMENDATIONS

The study highlighted the following:

- periodontal disease is a disease of the oral cavity in dogs that evolves directly in proportion to the accumulation of tartar, and the aging of the patients;
- disease evolution was not influenced by the type of food consumed;
- the microbiota present in the oral cavity of dogs with paradontal disease is in a continuous change, depending on the stage of the canine patient with paradontal disease;
- the sensitivity of the microbiota to the tested antibiotics varies depending on the age of the patient and the stage of the periodontal disease;
- the most effective measure to prevent the development of periodontal disease is the removal operation.

Presentation for oral examination twice a year to examine the oral cavity and carry out the detoxing operation for the detection of tartar deposits, to produce an individual antibiotic for the identification of effective antibiotics on the pathogenic microbiota, daily administration of cramped bars to prevent the formation of a bacterial plaque, represents minimal recommendations to reduce the incidence of periodontal disease.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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