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Retrospective analysis of dogs and cats diagnosed with periodontal disease in the Dentistry sector at the University of Franca and the relationship with predisposing factors

Análise retrospectiva de cães e gatos diagnosticados com doença periodontal no setor de Odontologia da Universidade de Franca e a relação com os fatores predisponentes

Análisis retrospectivo de perros y gatos diagnosticados de enfermedad periodontal en el sector de la Odontología de la Universidad de Franca y la relación con factores predisponentes

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Abstract

Periodontal disease is the most commonly diagnosed disease in dogs and cats, being characterized by the involvement of protective tissues and support of dental elements, which form the periodontium. The causative agent is the organized bacterial plaque that, when mineralized, forms the dental calculi, facilitating the progression of the disease. In view of the high incidence of oral diseases in pets and the consequent local and systemic damage, the objective of the present study was to carry out a retrospective study of 335 cases seen in the Veterinary Dentistry of Small Animals sector at the University of Franca, emphasizing those of periodontal disease and, nevertheless, relate them to the review, predisposing factors and classification in degrees. After percentage analyzes, it was observed that 53.3% of the animals were females and 46.7% males and, the majority of the canine specie, being that of the 335 animals, 276 were diagnosed with periodontal disease in degrees varying from mild to severe. In relation to age, most was adults, senile and small, and in terms of race, the mixed breed followed by Poodles were the most affected by periodontal disease. Most tutors offer dry commercial feed; however, with homemade food and, in addition, they do not have the habit of periodically brushing the teeth of these patients. With the data obtained in this retrospection, it is admitted that periodontal disease, in its most varied degrees, is frequently diagnosed in companion animals, especially in small and senile ones, having numerous aggravating factors for its progression and chronicity.

Keywords: Tooth brushing; Small animal dentistry; Periodontitis; Bacterial plaque; Oral health.

Resumo

A doença periodontal é a enfermidade mais comumente diagnosticada em cães e gatos, sendo caracterizada pelo acometimento dos tecidos de proteção e sustentação dos elementos

dentários, os quais formam o periodonto. O agente causal é a placa bacteriana organizada que ao se mineralizar forma os cálculos dentários, facilitando a progressão da doença. Perante a alta incidência das afecções orais em animais de companhia e dos consequentes danos locais e sistêmicos, o objetivo do presente trabalho foi realizar estudo retrospectivo de 335 casos atendidos no setor de Odontologia Veterinária de Pequenos Animais da Universidade de Franca, enfatizando os de doença periodontal e, não obstante, relacioná-los com a resenha, fatores predisponentes e classificação em graus. Após análises percentuais, observou-se que 53,3% dos animais eram fêmeas e 46,7% machos e, a maioria da espécie canina, sendo que dos 335 animais, 276 foram diagnosticados com doença periodontal em graus variando de leve a grave. Em relação à idade, a maior parte era adultos, senis e de porte pequeno e, quanto à raça, os sem raça definida seguidos dos Poodles foram os mais acometidos pela doença periodontal. Grande parte dos tutores oferece ração comercial seca; no entanto, acrescida de comida caseira e, além disso, não possuem o hábito de periodicamente escovarem os dentes destes pacientes. Com os dados obtidos nesta retrospecção, admite-se que a doença periodontal, nos seus mais variados graus, é frequentemente diagnosticada em animais de companhia, principalmente nos de porte pequeno e senis, tendo inúmeros fatores agravantes para sua progressão e cronicidade.

Palavras-chave: Escovação dentária; Odontologia de pequenos animais; Periodontite; Placa bacteriana; Saúde oral.

Resumen

La enfermedad periodontal es la enfermedad más comúnmente diagnosticada en perros y gatos, y se caracteriza por la afectación de tejidos protectores y soporte de elementos dentales, que forman el periodonto. El agente causal es la placa bacteriana organizada que, al mineralizarse, forma los cálculos dentales, lo que facilita la progresión de la enfermedad. Ante la alta incidencia de enfermedades bucodentales en mascotas y el consiguiente daño local y sistémico, el objetivo del presente estudio fue realizar un estudio retrospectivo de 335 casos atendidos en el sector de Odontología Veterinaria de Pequeños Animales de la Universidad de Franca, destacando los de enfermedad periodontal y, no obstante, relacionarlos con la revisión, factores predisponentes y clasificación en grados. Después de los análisis porcentuales, se observó que el 53,3% de los animales eran hembras y el 46,7% machos, y la mayoría de la especie canina, y de los 335 animales, 276 fueron diagnosticados con enfermedad periodontal en grados que varían de leve a grave. En relación a la edad, la mayoría eran adultos, seniles y pequeños, y en cuanto a raza, el mestizo seguido de los

Poodles fue el más afectado por la enfermedad periodontal. La mayoría de los tutores ofrecen piensos comerciales secos; sin embargo, con comida casera y, además, no tienen la costumbre de cepillar periódicamente los dientes de estos pacientes. Con los datos obtenidos en esta retrospección, se admite que la enfermedad periodontal, en sus más variados grados, es frecuentemente diagnosticada en animales de compañía, especialmente pequeños y seniles, teniendo numerosos agravantes para su progresión y cronicidad.

Palabras clave: Cepillado de dientes; Odontología de pequeños animales; Periodontitis; Placa bacteriana; Salud bucal.

1. Introduction

Among the various conditions that commonly affect the oral cavity of dogs and cats, periodontal disease (periodontitis) stands out, considered the most common cause of oral infection and tooth loss in these species, being characterized by causing impairment in the structures of the responsible periodontium for protection (gingiva) and dental support (cementum, periodontal ligament and alveolar bone) (Niemiec, 2008).

The etiologic agent is the bacterial plaque, formed by the association of bacteria, food debris, leukocytes, macrophages, lipids, carbohydrates, mineral salts, metabolites and oral peeling cells (Garcia et al., 2008; Santos, Carlos & Albuquerque, 2012). It is constantly formed and organized, and if not removed, it mineralizes by precipitation of salivary mineral salts, forming the dental calculus (odontolith) that adheres to the teeth, predisposing to the progression of oral disease because it is rough and facilitates the adherence of more dirt and pathogenic microorganisms (Gioso, 2003).

With the organization and interaction of the constituents of the bacterial plaque, by-products are produced that contaminate the entire oral cavity and damage the periodontal and adjacent structures, by triggering an immune response, with consequent production of prostaglandins, activation of enzymes like collagenases, proteases and osteoclast stimulation (Carreira, Dias & Azevedo, 2015; Wallis et al., 2015). Periodontal disease is classified according to the degree of involvement of the periodontium as absent, mild, moderate or severe (Gioso, 2003).

Several factors can influence the predisposition and worsening of the disease such as age, race, size, type of food and non-oral hygiene (Silva et al., 2017). Also, due to the rich vascularization of the periodontium and the movement of the tooth in the tooth socket, bacteria and their metabolites can enter the lymphatic and blood vessels and the systemic

immune response secondary to microorganisms predispose the production of immune complexes in the bloodstream. These can adhere internally to the walls of the endotheliums causing functional failure of organs such as the kidneys, liver, joints and heart (Whyte, 2014; Almeida et al., 2017; França et al., 2017; Kang et al., 2017).

In view of the high casuistry of oral affections in small animals and the various local and systemic consequences, the purpose of this work was to carry out a retrospective study of cases seen in the sector of Small Animal Veterinary Dentistry at the University of Franca, emphasizing those with periodontal disease and, nonetheless, relate them to the patients' review, degree of involvement and other predisposing factors.

2. Methodology

Was analyzed 335 records referring to the specialized care of the Small Animal Veterinary Dentistry sector at the Veterinary Hospital of the University of Franca (UNIFRAN/SP), in the period from January 25, 2007 to October 2, 2017.

From these care records, the diagnosed cases of periodontal disease were highlighted, relating them to the patients' review (sex, species, age, race and size) and predisposing factors (type of food provided and oral hygiene habits), in addition to the classification of this oral condition in degrees (mild, moderate or severe) made by the same dental professional.

The methodology was based on laboratory research, of a quantitative nature (Pereira et al., 2018) and the data obtained were expressed by descriptive analysis.

3. Results

Of the 335 dental care records analyzed of the dogs and cats, 276 animals were diagnosed with periodontal disease and, of these, 147 were females (53.3%) and 129 males (46.7%).

Of the 276 records of animals diagnosed with periodontal disease, 270 were of the canine species (97.8%) and six of the feline species (2.2%). Only one animal (0.4%) was aged between zero and one year, 115 animals (41.6%) between 2 and 7 years old, 136 animals (49.3%) aged between 8 and 18 years old and 24 animals (8.7%) did not have the age informed in the attendance form.

It was observed that the majority (78: 23.3%) were of mixed race and Poodle (77: 23%), followed by the Pinscher (22: 6.6%), Teckel (21: 6.3%), Cocker and Yorkshire (14:

4.2%), Maltês (7: 2.1%), Shitzu (5: 1.5%), Rottweiler, Lhasa Apso and Basset Hound (4: 1.4%), Boxer, Schnauzer and Fox (3: 0.9%), Pug, Pit Bull and Labrador (2: 0.6%) and Beagle, Bichon Frise, Bull Terrier, Chuiahua, Golden Retriever, Husky Siberiano, Scoth Terrier, Spitz, West Terrier, Persa and Siamês (1: 0.3%).

Regarding the size of those involved, 204 animals (73.9%) were small (<10 kg), 41 animals (14.9%) of medium size (between 10 and 20 kg), 28 animals (10.1 %) of large size (> 20 Kg) and three animals (1.1%) without weight identified in the attendance forms.

Regarding the type of food, most tutors (138: 50.0%) provided homemade food and animal feed, instead of just commercial feed. In addition, 276 animals (100%) were not subjected to periodic tooth brushing.

Of the 276 animals diagnosed with periodontal disease, 65 cases were classified as mild periodontitis (23.6%), 89 cases moderate (32.2%) and 122 cases of severe periodontitis (44.2%).

4. Discussion

Among the diseases of the oral cavity, periodontal disease is the most prevalent in small animals (Abdalla et al., 2009; Santos, Carlos & Albuquerque, 2012), affecting about 70% of cats and 85% of dogs over two years of age (Niemiec, 2008), progressing with advancing age (Kortegaard, 2008). These descriptions corroborated with the results of the current study, which found that 276 (82%) of the 335 (100%) animals had mild to severe periodontitis, with the elderly being the most affected.

In this sense, the age of the patient is one of the important predisposing factors for periodontal disease (Silva et al., 2017), especially in those fed with homemade, canned food and snacks, since by the pasty consistency, they adhere more easily to the teeth , favoring the progression of the disease (Gorrel, 1998), as shown in the present study. In this way, the importance of offering only commercial feed is emphasized, which allows mechanical and abrasive cleaning of the dental elements, due to the texture of the pellets (Capík, 2010).

For consistency, dry commercial rations induce a higher frequency of chewing, which stimulates salivary flow, increasing the production of antimicrobial agents that assist in cleaning the oral cavity (Logan, 2006). In addition, the rations available on the veterinary market are composed of polyphosphates that act as chelators of salivary calcium, preventing the mineralization of bacterial plaque in odontoliths (Gioso, 2003; Santos, Carlos & Albuquerque, 2012).

Together with the age and type of food provided, periodic non-oral hygiene, through tooth brushing, also predisposes and considerably worsens periodontal disease in small animals (Santos, Carlos & Albuquerque, 2012); these literary descriptions exactly coincide with the findings of this research, in which none of the 276 patients with periodontal disease underwent such a preventive procedure.

In this context, the non-execution of tooth brushing in all patients with periodontal disease in this study, can be attributed to the unavailability of time and skill of the tutors associated with the lack of knowledge of this method of oral prevention, in addition to the non-collaboration of patients because they were not conditioned to the procedure since puppies, as described by Lima et al. (2004).

To be efficient, tooth brushing must be performed at least three times a week (Watanabe et al., 2015), because the etiologic agent of periodontal disease takes 24 to 48 hours to organize and only after this ordering of its constituents is able to cause periodontal and soft tissue injuries, then it needs to be removed during this time interval (Gioso, 2003; Brown, Mcgenity & Chem, 2005). Veterinary dentifrices, in addition to not having soaps like humans, present an attractive flavor to animals (meat), as well as products in their composition (zinc, chlorhexidine, sodium hexametaphosphate and enzymes (thiocyanate, peroxidase, glycooxidase) (Domingues et al., 1999) that inhibit the formation and adhesion of plaque, destabilizing chemical bonds (Brown, Mcgenity & Chem, 2005).

In line with Gioso (2003), it was observed that the canine species was the most affected by periodontal disease. That way, you should consider the nature of most dogs, favoring oral manipulation by tutors and, consequently, the detection of abnormalities involving the stomatognathic system; in addition, the greater ease of transport of these animals to a specialized dental care center. Still, one should consider the semi-household habit of some cats, which makes it difficult to detect oral clinical symptoms, as exposed by Santos, Carlos and Albuquerque (2012).

Regarding the animal species involved in this work, it was found that the canine stood out in relation to the feline regarding the diagnosis of periodontal disease, possibly because dogs allow direct contact with their guardians and they easily detect the presence of halitosis, symptom commonly described in this type of oral disease (Santos, Carlos & Albuquerque, 2012). In this context, halitosis is characterized by the destruction and putrefaction of oral tissues and bacterial fermentation with the release of sulphorous compounds (Gioso, 2003).

Similar to what was observed in this retrospective study, small patients are the most affected by periodontal disease, because they are more likely to accumulate plaque and dental

calculus, due to the teeth having little bone support, limited inter-dental space, crowding, in addition to malocclusion and dental anomalies, which makes it difficult to remove dirt by natural methods such as moving the lips and tongue, chewing and gnawing objects (Gioso, 2003; Santos, Carlos & Albuquerque, 2012).

According to the descriptions of Gioso (2003) and Roza (2004), the Poodle breed, in this study, demonstrated a high predisposition to periodontal disease, probably due to their size. On the other hand, no relationship was observed with the other breeds cited by these same authors, since most of the dental records analyzed were of mixed breed dogs. On the other hand, Eurides, Gonçalves and Mazzanti (1996) stated that in mixed breed dogs, the incidence of plaque is high, especially in animals over the age of six.

Although it has not been scientifically proven, to date, predisposition related to the sex of the animal in relation to periodontal disease (Gioso, 2003), in the current research it was observed that the females were discreetly more diagnosed with such oral affection.

The periodontal disease is progressive, which can cause oral ulcerations and considerable bone resorption, which predisposes the occurrence of oro-nasal communication and maxillary and mandibular fractures (Kortegaard, 2008). Given the high incidence of oral disorders in small animals and the consequent local and systemic impairments, it is essential to promote and raise awareness among tutors regarding methods of preventing periodontal disease, as well as early diagnosis and treatment, seeking better quality of life and survival, regardless of age, race, sex, size and species affected (Roza, 2004).

As limiting factors of this type of retrospective study, highlight the failure to correctly fill out dental care and treatment forms for dogs and cats; in addition to the omission and lack of knowledge of some information by the tutors of animals of theses species.

5. Final Considerations

Based on the applied methodology and the results obtained, it can be inferred that periodontal disease is commonly diagnosed in small animals, especially in elderly, showing varying degrees of commitment; also, that the type of food provided and the habit of oral hygiene are predisposing factors for this oral disease. However, given the local and systemic impairments caused by periodontal disease, early diagnosis and treatment directly reflect on the quality of life and survival of those affected, thus emphasizing the importance of the dental specialty for dogs and cats and the dissemination of such information, especially preventive ones, to the respective tutors.

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