ISSN: 1220-3173; E-ISSN: 2457-7618

THE CORRELATION BETWEEN THE DIET AND THE PERIODONTAL DISEASE IN DOGS

CORELAȚIA DINTRE DIETĂ ȘI BOALA PARODONTALĂ LA CÂINI

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ABSTRACT | REZUMAT

The main cause of gingivitis and periodontitis in dogs is represented by the bacterial plaque presence on the dental surface. If this plaque is not removed, it leads to mineralization in a short period of time (two days), having as result the dental tartar. Brushing or washing teeth is important for removing a high bacteria count, bacteria which are present both in the dental plaque and in tartar. The food type effect on the dental plaque and tartar development was studied on 94 dogs with ages between 5 months and 14 years which were fed with three types of food: dry, mixed and soft food. The proportion of cases of periodontal disease was 88.8% in dogs fed with soft texture diet, 78.5% in mixed fed dogs and only 47.6% in those with a dry, hard diet. Diet consistency as well as its composition can affect the tartar accumulation rate. Dental home care of dogs is a necessity which must become an owner's routine, as a periodontal disease prevention method.

Key words: diet type, periodontal disease, dog

Principala cauză a gingivitei și a parodontitei la câini este reprezentată de prezența plăcii bacteriene pe suprafața dentară. Dacă această placă nu este îndepărtată, aceasta duce la mineralizare într-o perioadă scurtă de timp (două zile), având ca rezultat tartrul dentar. Periajul sau spălarea dinților este importantă pentru înlăturarea numărului ridicat de bacterii, prezente atât în placa dentară, cât și în tartru. Efectul tipului alimentar asupra dezvoltării plăcii dentare și a tartrului a fost studiat pe 94 de câini cu vârste cuprinse între 5 luni și 14 ani, care au fost hrăniți cu trei tipuri de alimente: uscate, mixte și moi. Proporția cazurilor de boală parodontală a fost de 88,8% la câinii alimentați cu o dietă moale, 78,5% la câinii hrăniți mixt și doar 47,6% la cei cu o dietă bazată pe hrană uscată și tare. Consistența dietei, precum și compoziția acesteia pot afecta rata de acumulare a tartrului. Îngrijirea dentară la domiciliu a câinilor este o necesitate care trebuie să devină o rutină a proprietarului, ca metodă de prevenire a bolilor parodontale.

Cuvinte cheie: tip alimentar, boala parodontală, câine

Tartar is represented by mineralized bacterial plaque. It is a known fact that tartar has a detrimental effect upon soft tissues because of its rough surface. On the other hand, it is also known that this surface alone doesn't produce gingivitis. The importance of tartar in the periodontal disease consists more in its role as retention surface for bacteria and food (7, 9). The most important method to prevent the periodontal disease is represented by the removal of the dental plaque. Diet consistency and texture have an important role in dental deposit accumulation and in developing periodontopathy in dogs. Oral health in dogs and cats is much influenced by food consistency.

The aim of this study is to elucidate, or, at least, to fill in some gaps in the existing literature about the relation between the diet and the periodontopathy evolution in dogs.

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MATERIALS AND METHODS

Animals

This survey was conducted on 94 dogs of different breeds and sexes, aged between 5 months and 14 years. All dogs come from Timiș County (Timişoara city and surroundings).

Survey design

This information is based only on the owners' report. All cases were registered and for each of them a dental record has been drawn up, with special cells for diet type. Depending on the texture of the food, the dogs were divided into 3 groups:

1. Dogs fed with industrial dry food, with a tough consistency (biscuits);
2. Dogs fed with mixed or variable food (food consisted of dry food once or twice per day and the third meal included homemade food, or the dog was exclusively fed with dry food soaked in various liquids);

3. Dogs exclusively fed with soft food (canned or homemade food).

RESULTS AND DISCUSSIONS

Unfortunately, it was not possible to choose the animals so that the average age of the three groups is equal. The age average of the first group was 3.5 years old, in the second group, 5.3 years old, and in the third group, 6.4 years old.

Following the data in Table 1 and Fig. 1, it can be observed that from 94 dogs under scrutiny, 21 were fed exclusively with dry food. In this group, the periodontopathy percentage was 47.6, respectively 10 dogs presented clinical symptoms of gingivitis and/or periodontitis. The oral hygiene of these dogs was poor or even absent in the majority of cases. An alimentary regime with tough consistency will conduct to mechanical cleaning of the dental plaque and bacteria, the oral cavity being partial cleaned. As a result, the severity of the periodontal disease decreases or its evolution may slow down, but this measure cannot be considered as protective.

In dogs from second group (dogs fed with mixed food), the periodontopathy percentage was 78.5, respectively 22 dogs presented periodontal lesions.

In the third group (dogs fed with soft food), the periodontopathy was 88.8%.

Periodontal disease is produce by a high number of bacteria accumulations in teeth junction with gum.

A prolonged time of the bacteria at this level will produce a change of the predominant microflora, from aerobic, rods gram positive bacteria to anaerobe mobile shaped gram negative bacteria (1).

Sulfate-reducing bacteria are responsible not only for halitosis, but also for their role in periodontal disease pathogenesis (2, 3).

It is well known that a diet made up of soft food will conduct to a higher number of dental plaques due to the higher adhesiveness of such aliments.

These explain the high percentage of periodontopathy in dogs which are fed with homemade food.

Our observations are similar to the data reported in the literature by other authors (6, 11). Some studies have been carried out over the years and their results are in support of the idea that dogs which are fed with soft food tend to display an increase in the dental plaque and tartar speed accumulation (4). Other studies have found that a diet with a tough consistency can reduce the accumulation of the dental plaque unevenly, only on a few teeth and some dental surfaces, respectively the most used ones during the mastication (5). Complete lack or insufficient dental care at home will allow the plaque and tartar to form continuously and the results will be an increased risk of periodontal disease incidence. Most of the authors recommend home care as being the most efficient method to prevent periodontal disease both in dogs and cats.

According to the existing data in the literature (8, 10, 14), about 75% of adult dogs suffered from different dental diseases.

In recent years, different dry food formulas containing various components, such as polyphosphates, have been developed to prevent plaque mineralization and its transformation into dental plaque. Logan (2006) has shown that eating a particular type of food with a particular composition (polyphosphates) can lead to a significant reduction in plaque and tartar, and the severity of gingivitis, too (10).

Tromp et al (1986) favour the idea that the most efficient method to prevent and control periodontal disease is regular tooth brushing – daily, if possible (13).

Rawlings and Gorrel (1997) recommends mechanical methods to reduce dental plaque and tartar through a tough texture of the diet (12).

Our results show that the owner must be well informed about the importance of the oral cavity hygiene in dogs and cats, to understand the fact that each oral infection can affect other organs (hearth, liver, kidneys).

Table 1

Periodontopathy distribution in dogs according with alimentation type

Group	Alimentation type	Number of studied dogs	Dogs with periodontopathy	
			No	%
1	**Dry food**	21	10	**47.6**
2	**Mixed food**	28	22	**78.5**
3	**Soft food** (homemade food)	45	40	**88.8**

The periodontal disease is most often considered to be a condition closely related to the diet. The type of diet is considered a risk factor in the development of dental diseases in dogs. The results obtained in this study show that the frequency of the occurrence of periodontitis is much higher in dogs that are fed with a soft meal (canned or household waste), than those which are fed a commercial dry meal. However, it is certain that maintaining a healthy periodontium requires adequate oral hygiene and a balanced diet.

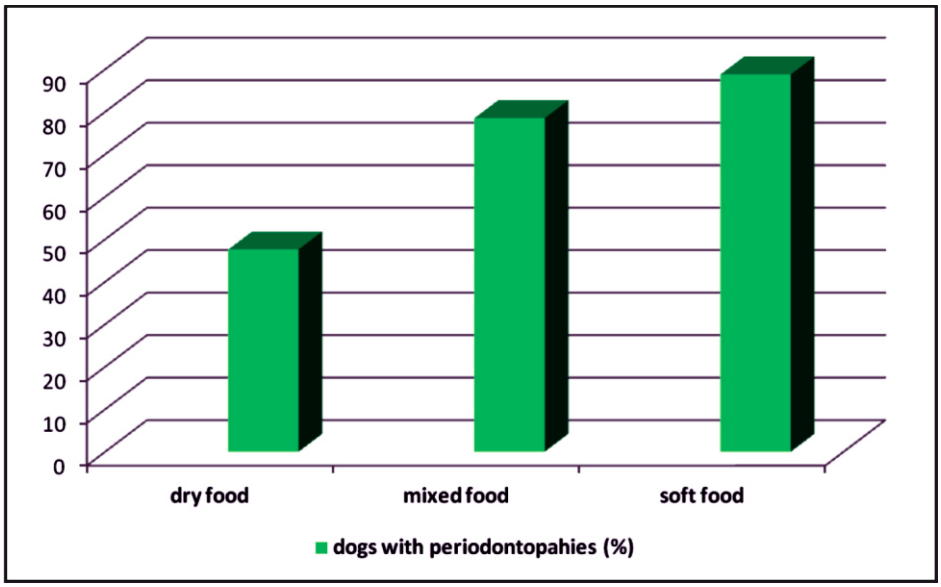

Fig. 1. The periodontopathy prevalence in dogs and feeding type

We consider the dog's dental care as a necessity, which must become a habit for the dog owners for whom the health and quality of life of their dogs is, from all point of views, important.

CONCLUSIONS

The proportion of cases of periodontal disease was 88.8% in dogs whose intake consisted in a soft texture diet (40 dogs showed signs of periodontal disease in 45 dogs examined), 78.5% in mixed fed dogs (22 of sick dogs out of 28 examined), and only 47.6% in those with a dry, hard diet (10 dogs with periodontal lesions from 21 examined). The consistency of the diet, as well as its composition, can affect the rate of dental plaque. Dogs that were fed with industrially prepared food (croquettes, biscuits) with a harsh texture had a lower proportion of periodontitis and due to its composition, which probably influenced the rate of dental plaque accumulation.

REFERENCES

1. *Costinar L., Herman V., Pascu C.,* (2010), The presence of sulfate-reducing bacteria in dog's oral cavity. Lucr St Med Vet Timişoara, XLIII(1):128-131
2. *Costinar L., Pascu C., Herman V*., (2009), Plasmid profile of some Gram positive strains isolates from dogs oral cavity. 62° Congresso Internazionale Multisala SCIVAC, 29-31 Maggio 2009, Rimini, Italy, 560
3. *Costinar L., Popa V.,* Pascu C., (2009), Genotypic differentiation of bacterial strains isolates from oral cavity from dogs with periodontal diseases by RAPD. 62° Congresso Internazionale Multisala SCIVAC, 29-31 Maggio 2009, Rimini, Italy, 558
4. *Gawor J.P., Jodkowska K., Kurski G., Kurek A., Wojtacki M.P.,* (2005), Pet smile campaign in Poland-promotion of oral hygiene and survey of oral cavity in Polish pets. WSAVA World Congress Proceedings, May 11-14, 2005, Mexico City, Mexico (available at: https://www.vin.com/apputil/content/defaultadv1.aspx?pId=11196&meta=Generic&catId=30767&id=3854363)
5. *Gorrel C.,* (1997), Periodontal disease and diet in domestic pets. The Journal of Nutrition, 128(12): 2712S-2714S
6. *Gorrel C.,* (2001), The effects of diet on periodontal disease. WSAVA World Congress Proceedings, August 8-11, 2001, Vancouver, British Columbia, Canada (available at: https://www.vin.com/VINDBPub/SearchPB/Proceedings/PR05000/PR00060.htm)
7. *Hale F.,* (2001), Home care products and how they work. WSAVA World Congress Proceedings, August 8-11, 2001, Vancouver, British Columbia, Canada (available at: https://www.vin.com/VINDBPub/SearchPB/Proceedings/PR05000/PR00052.htm)
8. *Hoffmann T., Geangler P.,* (1996), Epidemiology of periodontal disease in poodles. J Small Anim Pract, 37(7):309-316

9. *Lepine A.L., Murray S.M., Cox E.R.,* (2003), Clinical Investigation of Dental Diet Efficacy in the Senior Dog. Recent advances in Dental Health Management, The Iams Comp.: Dayton, OH, USA, 26-32
10. *Logan E.I.* (2006), Dietary influences on periodontal health in dogs and cats. Clin North Am Small Anim Pract, 36(6):1385-1401
11. *Pavlica Z., Erjavec V., Erzen D., Petelin M.,* (2003), A full-mouth radiographic survey of periodontal bone loss in dogs. Acta Vet Brno, 72:391-398
12. *Rawlings J.M., Gorrel Cecilia,* (1997), Effect of two dietary regimens on gingivitis in the dog. J Small Anim Pract, 38(4):147-151
13. *Tromp J.A., van Rijn L.J., Jansen J.,* (1986), Experimental gingivitis and frequency of tooth-brushing in the beagle dog model. Clinical findings. J. Clin Periodontol, 13(3):190-194
14. *Wattson A.D.J.,* (1994), Diet and periodontal disease in dogs and cats. Austral Vet J, 71(10):313-318