



## RESEARCH PAPER

# Periodontal diseases and other dental disorders in dogs : An epidemiologic study

Praveen Kumar\* and Lovelin Shweta Xaxa<sup>1</sup>

Department of Veterinary Medicine, Ranchi Veterinary College, Kanke, Ranchi (Jharkhand) India

**Abstract :** The study determined the epidemiology of periodontal diseases among dogs. This study was conducted on 181 dogs older than 6 months to examine their oral cavities and gather information about their feeding habits. Periodontal diseases were reported in 59.67% of dogs. It was highest for Spitz (75.61%), followed by German shepherd (64.49%), Mongrel (61.53%), Labrador (51.02%) and other Non-descriptive breeds (33.9%). Compared to dogs fed only vegetarian diets, those fed non-vegetarian diets had few health problems. There was the highest incidence of dental problems among vegetarians (69.28%), followed by those given a combination of vegetarian and non-vegetarian diets (51.32%). Periodontitis was common in these dogs, regardless of its cause, and its incidence increased with age. Lesions were more severe in the premolar and molar regions than in the maxillary and mandibular incisor regions. The incidence of missing teeth increased with age. First premolars were the most commonly lost teeth, followed by other premolars and molars, where severe periodontitis was commonly found. The incidence and severity of calculus on teeth increased with age. Due to these findings, it is especially important to keep dogs' dental hygiene in good condition and conduct continuous periodic examinations.

**Key Words :** Dogs, Periodontitis, Calculus, Caries

**View Point Article :** Kumar, Praveen and Xaxa, Lovelin Shweta (2021). Periodontal diseases and other dental disorders in dogs : An epidemiologic study. *Internat. J. agric. Sci.*, 17 (AAEBSSD) : 163-167, DOI:10.15740/HAS/IJAS/17-AAEBSSD/163-167. Copyright@2021: Hind Agri-Horticultural Society.

**Article History :** Received : 16.07.2021; Revised : 19.07.2021; Accepted : 24.07.2021

## INTRODUCTION

The degrees of periodontal disease are variable in dogs, and it is evident that dental calculus and soft deposits influence the level of inflammation in periodontal tissues (Stella *et al.*, 2018). In veterinary practices, periodontal disease is a common problem. Since the teeth of dogs vary greatly in size and function and are subject to dietary abrasion of the crown surface and gingival margin area, there is a wide variation in the extent of disease affecting

particular animals, groups of animals and regions of the mouth. It is one of the most common disorders in the oral cavity of various animals and results in teeth loss (Hamp *et al.*, 1972). Having poor dental health contributes significantly to the development of periodontal disease. It is one of the most common diseases seen in small animal practices (Robinson *et al.*, 2016). Soft food, poor dental hygiene and the spread of soft food have played a role in the increased level of dental diseases in dogs. Veterinary clinics must have the opportunity to accurately

\* Author for correspondence :

<sup>1</sup>Department of Veterinary Clinical Complex, Ranchi Veterinary College, Kanke, Ranchi (Jharkhand) India

Age	0.5-2.0	2.0-5.0	5.0- 8.0	>8.0	Total	Male	Female
Dog	48	36	44	53	181	94	87

Breed	Dogs	Male	Female
Spitz	41	17	24
Labrador	49	26	23
Mongrel	26	14	12
German Shepherd	42	24	18
Other non descriptive	23	13	10
Total	181	94	87

diagnose and treat diseases at an earlier stage, and use that information to support prevention strategies. Despite this, little is known about the extent and frequency of periodontal disease among different breeds and sizes of dogs. This report aims to describe the results of a detailed examination of the extent of calculus deposition, gingival inflammation, and loss of periodontal attachment of a large number of pet dogs.

## MATERIAL AND METHODS

A study was conducted at Ranchi Veterinary College, Kanke Ranchi, in the Department of Veterinary Medicine. There were 181 dogs examined over a period of one year, from January 2020 to December 2020 (Tables A and B). There were no systemic disorders in the animals. These animals were acquired from a veterinarian practice; they were healthy and had undergone various non-systemic procedures including health checks, and vaccinations. Animals were used only with the owners' permission.

Periodontal diseases were examined in the oral cavities of dogs over six months old. The number and location of teeth, as well as periodontal disease, dental calculus formation, and caries were all evaluated in each dog. For simplicity's sake, the examinations were only performed on the buccal region. Standard values for the number and formula of teeth in dogs were as described by Page and Schroeder (1982) and Tholen (1983). Based on the Gingival Index (GI) system by Loe and Silness (1963) with some modifications, the degrees of periodontal diseases were estimated according to the following 4 scale: 0: Healthy gingiva without gingivitis; 1: Gingivitis with slight swelling and turning reddish; 2: Gingivitis with swelling and turning reddish; 3: Gingivitis

with severe swelling and turning reddish, often with hemorrhages. Inflammation of the gingiva was measured on the buccal sites of all teeth areas despite the original method's recommendation of scoring four gingival sites of each tooth region. A calculus index system was used to measure the degree of oral hygiene based on the formation of dental calculus. The method employed was a modified version of Green and Vermillion's (1964) Oral Hygiene Index (OHI). Four ranks of calculus formation were: 0: No dental calculus; 1: Supragingival calculus covering less than one-third of the dental surface; 2: Supragingival calculus covering one-third or more but less than two-thirds; 3: Supragingival calculus covering more than two-thirds. All teeth were examined for the degree of calculus formation on the buccal surface. Dental caries was rated into 5 ranks according to the caries index system as follows: 0: No caries; 1: Caries restricted to enamel but not involving dentine; 2: Caries restricted to dentine but not involving dental pulp; 3: Caries involving dental pulp; 4: Dental crown destructed and only dental root remaining. A number of variables were evaluated, including age, gender, weight, and breed (defined or not). Patient data and feeding practices were recorded. The data were compared among these age groups.

## RESULTS AND DISCUSSION

Out of 181 dogs, 16 (8.84%) had received it. These treatments involved only scaling dental calculus. No surgery was performed. The overall incidence of periodontal disease among dogs (59.67%) was found to be high in the present study. Studies conducted by Wilson, 1993, and Ranjan *et al.* 2010 also revealed that pet dogs have a high prevalence of periodontal disease.

Court *et al.* 1993 detected periodontal disease in 100%, dental erosion in 54%, and dental tartar in 32% of dogs undergoing various surgical procedures. Harvey and Emily, 1993 found 60% to 80% of dogs and cats had periodontal disease. Among dogs older than 8 years, those with periodontal disease were more susceptible, with a incidence of 90.56 %, followed by those between 5 and 8 years with a incidence of 77.27% (Fig. 1). This observation is in agreement with that of Hamp *et al.* (1984), who observed a prevalence of more than 80% in dogs older than 6 years. Additionally, dogs of the 2-5 year age group in the current study had a 58.33% dental problem incidence. The severity of the disease was, however, less severe than in older dogs. A higher prevalence of periodontal disease has also been reported in older animals as compared to young ones (Meyer and Sutter, 1976). Periodontal diseases develop slowly. Possibly, this is why older dogs are more likely to suffer from periodontal diseases. In addition, different breeds have varying incidences of periodontitis. Among the dogs in this study, Spitz (75.61%) had the highest ratio of periodontitis, followed by German Shepherd (64.29%),

Mongrel (61.53%), Labrador (51.02%) and other nondescript breeds (39.53%) (Fig. 2). It was also reported by Gray (1923) that the periodontitis rate was higher in smaller breed dogs. For certain breeds, such as the Boxer, Dalmatian, and Dachshund, the sample sizes were inequitable and very small in the study. Consequently, it was not rational to draw any conclusions from this study.

Among small breeds and the elderly, Harvey *et al.*, 1994 found the periodontal disease to be more common. In a 2003 study, Pavlica *et al.* reported that 90% of small dog breeds over the age of 3 have some measurable periodontal disease.

In the present investigation, the gingival lesions observed were in various degrees: reddish and swelling, and sometimes with hemorrhages. Soft deposit or dental plaque was often associated with inflammation. The incidence and severity of periodontal diseases were almost the same on the right and left sides of the gingiva. The lesion was very frequent among dogs regardless of their sources and the incidence increased with age in both male and female dogs. Aging also increased the number and severity of gingival lesions. Of the various oral disorders, stomatitis was the most common (42.88%), followed by gingivitis (39.61%), and dental tartar (13.24%). Overall, the incidence of the disease was higher among male dogs (60.64%) than among female dogs (58.62%) (Fig.3). An analysis of the incidence of periodontitis by species was conducted (Fig. 4). The periodontal disease most frequently affected males in each breed of dog except the German shepherd. A premolar and a molar lesion were more severe and more common than maxillary and mandibular incisor lesions. Age was significantly associated with a decrease in the number of remaining teeth. Dogs of any gender

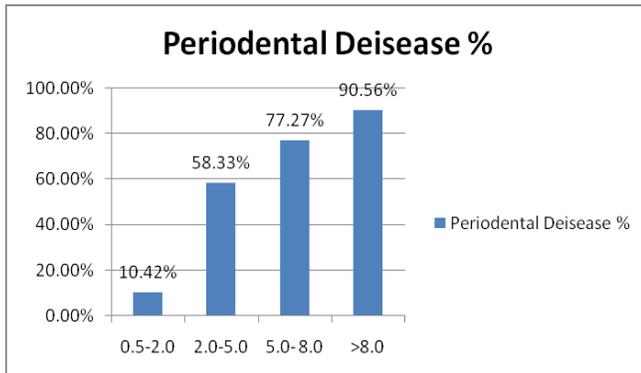


Fig. 1: Incidence of periodontitis according to age

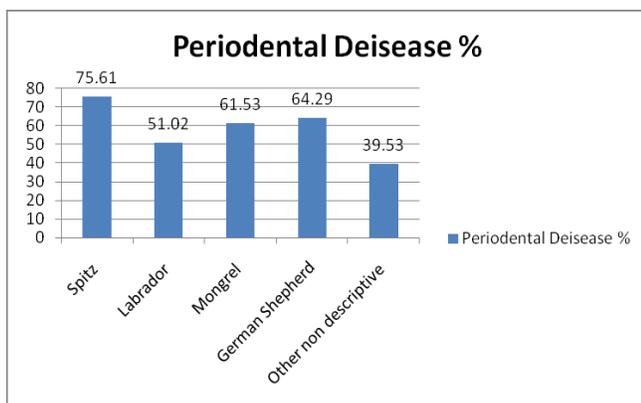


Fig. 2: Incidence of periodontitis according to breed

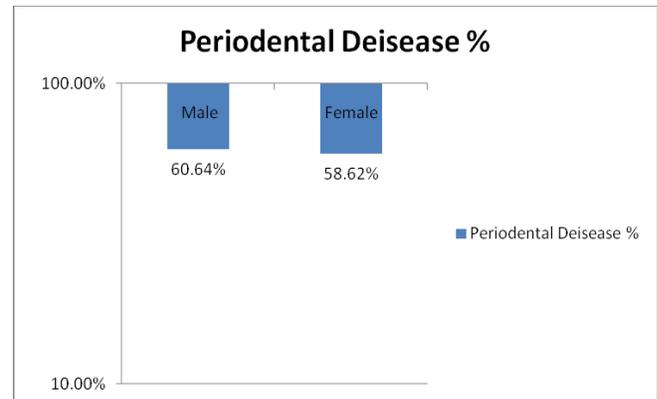
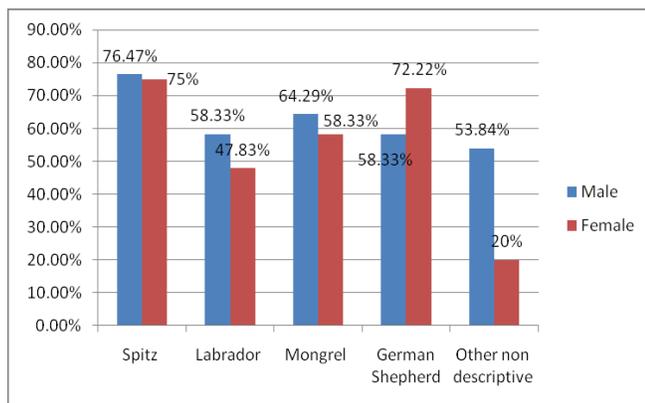


Fig. 3: Incidence of periodontitis according to sex

progressed in the reduction. The pattern of tooth loss in terms of the missing position and the dogs' age was about the same between male and female dogs and between the right and the left side. The teeth most commonly lost were the first premolars, followed by the third molars, the other premolars and the molars. In dogs older than 8 years, the first and second incisors were often missing. Many of the dogs examined had dental calculus. There was no difference in incidence between males and females. The incidence of calculi formation did not vary between the right and left sides, and it increased with age. Dogs were neither frequently nor seriously affected by dental caries. All age groups had a mean caries index of approximately 1. The occurrence of dogs receiving dental treatment is very low. Dogs appeared to be affected by their diets as well.



**Fig. 4: Incidence of periodontitis in different species according to sex**

Generally, dogs given a non-vegetarian diet appeared to suffer less than those given only vegetarian diets. Diets consisting only of vegetarian ingredients had the highest incidence of dental problems (69.28%), followed by diets consisting of vegetarian and non-vegetarian ingredients (51.32%). Aside from calcium and sodium, eggs are a rich source of minerals (Seuss Baum, 2007). Minerals such as these are beneficial for maintaining dental health. This may be the reason behind the lower incidence of periodontal disease in dogs given eggs in their diet. Foods that require chewing have been reported to decrease the development of plaque and calculus (Ruben *et al.*, 1962). In India, dry dog food is the most popular type of commercial pet food. It is generally hard and contains enough fiber to help reduce plaque and tartar formation and improve oral health.

## Conclusion:

It was concluded from the present study that there was a high incidence of dental disorders among dogs that increased with age. Dogs of a smaller breed were more likely to be affected. Clinical research is crucial in understanding the actual incidence of disease and in advancing the therapeutic procedures a veterinarian can provide to patients. It will contribute to the spread of preventive measures among dog owners and advance the effectiveness of therapeutic procedures done by veterinarians. In Japan, however, there have been only a few studies on the incidence of dental disorders in dogs. Therefore, this study cannot confirm whether dental disorders are increasing or decreasing from the past. The current results, however, at least reiterate the incidence of these disorders and suggest that dog owners may seek more dental treatment for their pets as a result.

## Acknowledgement:

The authors are grateful to the Vice-Chancellor, Director Research, BAU and Dean Ranchi Veterinary College for providing facilities and encouragement to conduct the clinical study at the Department of Veterinary Medicine.

## REFERENCES

- Court, L. A., Gimpel, R. J. and Rivera, L. S. (1993).** Dental abnormalities in dogs. *Advances-in-ciencias vet.*, **8**: 69-71.
- Gray (1923).** *Vet. Rec.* **3**:167.
- Greene, J. C. and Vermillion, J. It. (1964).** The simplified oral hygiene index. *7. Amm. Dent. Assoc.*, **68** : 7-13.
- Hamp, S. E., Lindhe, J. and Heyden, G. (1972).** Experimental gingivitis in the dog. An enzyme histochemical study. *Archs Oral Biol.*, **17**: 329—337.
- Hamp, S. E., Olsson, S.E., Farso, M. K. and Fornell, J. (1984).** A macroscopic and radiologic investigation of dental diseases of the dog. *Vet. Radiol.*, **25**: 86-92.
- Harvey, C.E. and Emily, P. (1993).** *Veterinary dentistry*. 1<sup>st</sup> Edn. W.B.Saunders, Philadelphia, pp. 89-144.
- Harvey, C. E., Shofter, F. S. and Later, L. (1994).** Correlation of age and body weight with periodontal disease in North American dogs. *J.Vet. Dentistry*, **11**:94-105.
- Loe, H. and Silness, J. (1963).** Periodontal disease in pregnancy, 1. Prevalence and severity. *Acta Odont. Scand.*, **21**:533—551.
- Meyer and Sutter (1976).** *Schweiz Arch tierheilk*, **118** : 307.

- Page, R.C. and Schroeder, H. E. (1982).** Periodon- titis in Man and Other Animals, A Comparative Review, Karger, Basel.
- Pavlica, Z., Eijavec, V., Erzen, D. and Petelin, M. (2003).** A full mouth radiographic survey of periodontal bone loss in dogs. *Acta vet. Brano.*, **72**: 391-398.
- Ranjan, R., Zahid, U. N., Gupta, D. K., Bansal, B. K. and Dua, K. (2010).** An epidemiological study on periodontal diseases in dogs - *A Clinical Study of 103 Canine Patients. Intas Polivet.*, **11** (II) : 274-277.
- Robinson, N. J., Dean, R. S., Cobb, M. and Brennan, M. L. (2016).** Factors influencing common diagnoses made during first-opinion small-animal consultations in the United Kingdom. *Preventive Veterinary Medicine*, **131**: 87-94.
- Ruben, P., McCoy, J., Person, P. and Cohen, D.W. (1962).** *Oral Surgery, Oral Medicine and Oral Pathology*, **15**:1061.
- Seuss Baum, I. (2007).** Nutritional evaluation of egg compounds. In: *Bioactive Egg Compounds* R. Huopalahti, R. Lopez-Fandino, M. Anton, R. Schade (Eds.). Berlin. pp. 117-140.
- Stella, J.L., Bauer, A.E., Croney, C. C. (2018).** A cross-sectional study to estimate prevalence of periodontal disease in a population of dogs (*Canis familiaris*) in commercial breeding facilities in Indiana and Illinois. *PLoS One.*, **13**(1): e0191395. doi: 10.1371/journal.pone.0191395.
- Tholen, M.A. (1983).** *Concepts in veterinary dentistry.* Veterinary Medicine Publishing Com- pany. Edwardsville, Kansas, U.S.A.
- Wilson G. (1993).** In :Newsletter, *Australian Veterinary Dental Society.* pp. 89.

17<sup>th</sup>  
Year  
★★★★★ of Excellence ★★★★★