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INFLUENCE OF ORAL HEALTH STATUS AMONG THE SPORTING BREED OF DOGS IN CHENNAI CITY: A COMPARATIVE CROSS-SECTIONAL STUDY

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ABSTRACT

BACKGROUND: Whenever there's normal, the other side occurs to be abnormal. Likewise, when a dog has a healthy oral status, there is always an unhealthy oral condition group of dogs. In this study, we had recorded and assessed the various types of diseases occurring in sporting breed of dogs.

AIM: The aim of the study is to determine the influence of oral health status among the sporting breeds of dogs in international pet show, Chennai city.

MATERIALS AND METHOD: A comparative cross-sectional study was conducted among sporting breed of dogs in International dog show, Chennai city based on simple random sampling method. Their oral health status was assessed by direct visual examination and by using questionnaire regarding demographic data, systemic diseases and tooth brushing. The data was analysed and tabulated using descriptive statistic and chi square test.

RESULTS: The results of the study showed that majority of mongrel breed had labioversion occlusion (9.5%) sippiparai breed had mesioversion occlusion (10.8%) and labrador breed had a labioversion occlusion (9.5%). Among the mongrel, sippiparai and labrador breed, the missing teeth status were recorded which were 25.7%, 39.2% and 35.1% respectively.

CONCLUSION: In recent days, oral health status of dogs is also important factor to assess their overall health. In our study they have a significant association between the malocclusion status and missing tooth status among the mongrel, sippiparai and labrador breed of sporting dogs.

Keywords: Oral health, sporting dogs, malocclusion, dental caries, plaque, periodontal disease.

INTRODUCTION

Sporting breeds are naturally active and alert, sporting dogs make likeable well-rounded companions. First developed to work closely with hunters to locate and/or retrieve quarry. They are known for their superior instincts in water and woods, many of these breeds enjoy hunting and other field activities. Many of them, especially the water retrieving breed; have well –insulated water repellent coats, which are quite resilient to the elements[1]. Just like humans, dogs also suffer from similar dental disease like humans do such as periodontal, orthodontic and endodontic diseases[2].

Dental disease is often described as a silent disease which can progress rapidly without the patient showing any obvious clinical signs. Patients with dental disease can continue to eat normally and may not let you know they are in pain. Specialists see many patients with broken teeth that have not changed their eating behaviour or their daily eating routine. A thorough examination can be done under anaesthesia including radiographs which may reveal dental disease that is not obvious in exam room[3].

The diseases in dogs are multifactorial which includes age, sex, demography, diet, oral hygiene maintenance and skeletal deformity. The custodian plays a major role in maintaining the diet and oral hygiene of a dog[4]. Dog vaccinations play a critical role in protecting your dog from much dangerous and even fatal disease. Although puppy vaccines and dog vaccinations are very important to the overall health and wellness of your canine companion. Some canine vaccinations should only be administered depending upon factors including, Age, Medical history, Environment, Travel habits and Lifestyle[5].

The periodontal diseases are more common in dogs that two thirds of the dogs are suffering from periodontal problems[6]. The mouth is the home for thousands of bacteria, these bacteria can multiply on the tooth surface and they form an invisible layer called plaque and organize into a biofilm[7]. Plaque bacteria which come into contact with the gingiva can result in inflammation and gradually leads to periodontitis -> tooth mobility -> and eventually tooth loss[8].

Periodontal disease is considered to be one of the causes for early tooth loss in dogs, with a minimum incidence level in adults of 70 per cent. Since the salivary flow is increased in dogs which may further lead to decrease in prevalence of dental caries and increase the prevalence of periodontal disease[9]. Periodontal disease has a serious consequence on the health of internal organs, such as liver, heart and kidneys[10]. Only half the client owners of dogs continue to provide the minimum effective frequency of tooth brushing beyond six months from professional scaling and polishing[11]. So the objective of the study is to determine the influence of oral health status among the mongrel, sippiparai and labrador sporting breed dogs in international pet show.

MATERIALS AND METHOD

A cross sectional study was conducted in the month of January, 2020. Convenience sampling was used to select the sporting dog in which sixty sporting breed of dogs was selected in an International dog show held in YMCA, Chennai which is organized by Madras canine club for 3 days. The ethical approval for this study was obtained from the department of public health dentistry, SRM dental college, Ramapuram. Only the dogs which are participated in the dog show were selected for the study. All the systemic and oral hygiene condition were assessed for the study. The systemic disease was assessed by asking the owner of the dog about the systemic disease the dog has and the oral health was assessed by seeking help of the owner of dog by holding them back with their mouth open by their owners and a quick study of their oral cavity was done. To check the posteriors, mouth mirrors were used to examine. The assessment of the dog's oral cavity was recorded in a modified case sheet specially edited for the veterinary study of the animals.

The Modified Tridan System[12] was used as a reference to determine the tooth numbering in the study. In the Modified Tridan System, the first number denotes the quadrant in the oral cavity and the second and third number denotes the tooth number in the respective quadrant.

The vaccination of the dogs was also recorded during the study which directly relates with the systemic health condition of the dogs and helps identify the systemic disease of dog if present any. The assessment of the periodontal disease is recorded in the study by using the reference taken from the study conducted by Grossi[13]. The assessment of the periodontal status was done by visual assessment in the dog's oral cavity. The dog's mouth was held back by their owners and the assessment was recorded in the case sheet. According to the Geraldine Gorman, he classified periodontal status into five stages; the stage one represents a healthy gingiva. In a stage 1 periodontal disease the gingiva appears to have redness in gingiva without having any attachment loss, it's also called as gingivitis. On stage 2 periodontal disease, the gingiva appears oedematic and has an increased gingival inflammation, during probing there's about less than 25% attachment loss. In stage 3, it turns out to be moderate periodontitis. There is pocket formation in about 25% to 50% support loss. There occurs bleeding on gentle probing. Furcation and tooth mobility can occur. Stage 4 is the last stage of periodontal disease. It's also called as advanced periodontitis, in stage 4 there is breakdown of support tissue with more 50% of tooth has pocket formation or recession of gingiva. The figures show the stages of periodontal index.

Figure 1: Plaque formation in dogs

To record plaque index, the dog's mouth was wide opened by their owners. For labial side the plaque was visually assessed and for the lingual side mouth mirrors were used to visualise the plaque. According to Logan and Boyce Plaque Index (1994)[14], plaque coverage was recorded in percentage. In stage 0, no plaque is detected. In stage 2, 1% to 24% of the tooth was covered. In stage 2, 25% -49% of tooth was covered. In stage 3, 50% - 74% of tooth was covered. In stage 4, more than 75% of the tooth was covered.

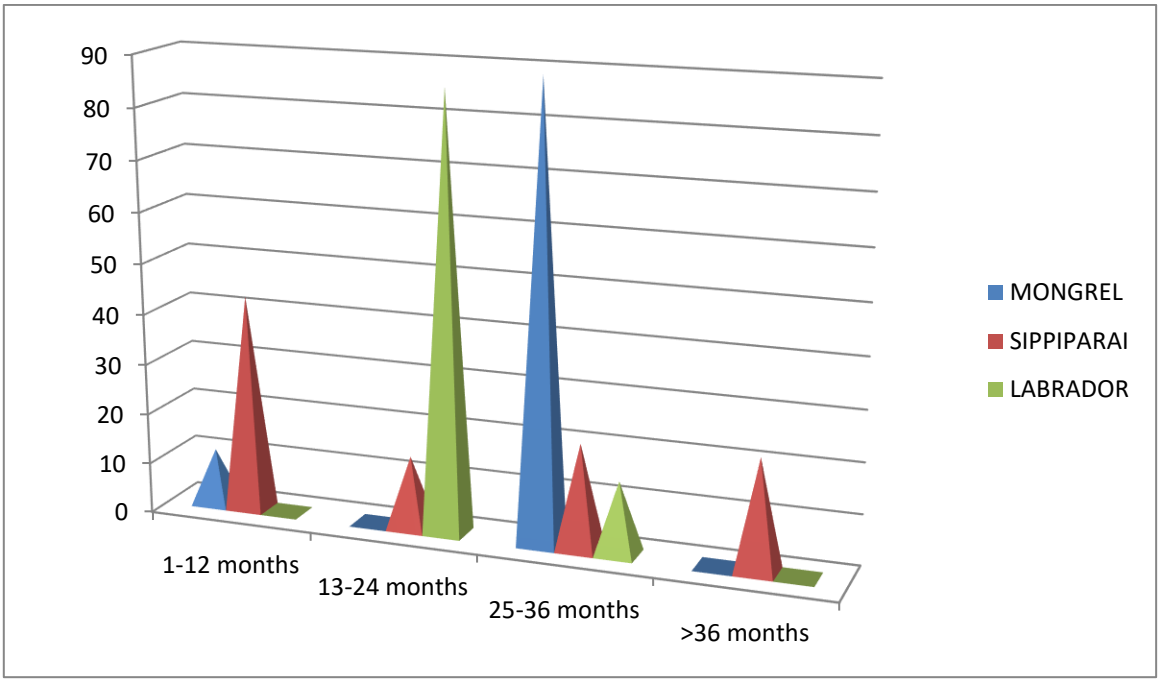
The American Veterinary Dental College classified malocclusion[15] into five different categories based on their anatomical position. To record malocclusion, the dog cheek was retracted by their owners and held in position until the assessment was recorded. In distoversion, the tooth is present normally in anatomical position on the dental arch but it's abnormally angled in the distal direction. For mesioversion, the tooth is normally present in its dental arch, but it's abnormally angulated in the mesial direction. In linguoversion, the tooth is normally present in its position and it's abnormally angulated towards the lingual direction. In labioversion, the incisor and the canine are in the normal position in the dental arch, but it's abnormally angulated towards labial direction. In the Buccoversion, a premolar or molar which is in anatomically in normal position and it's abnormally angulated towards buccal direction. In Crossbite, a malocclusion in dog in which the mandibular tooth or teeth have more antagonist than the maxillary tooth.

According to calculus index[16], stage 0, the gums are pink and healthy. In stage 1, gums are still pink and healthy. On stage 2, the gums lines are inflamed with gingivitis. On stage 3, the gums line is inflamed, likely case of periodontal disease.

Based on the location[10], caries is classified as pit and fissure caries, smooth surface caries and root caries. In pit and fissure caries, it's further classified as occlusal and buccal or lingual pit caries. Statistical analysis was performed using SPSS Software version 25.0. Descriptive statistics was performed for the variables included in the study and chi square test was performed to find out the association of oral health status between the mongrel, Labrador and sippiparai sporting breed of dogs

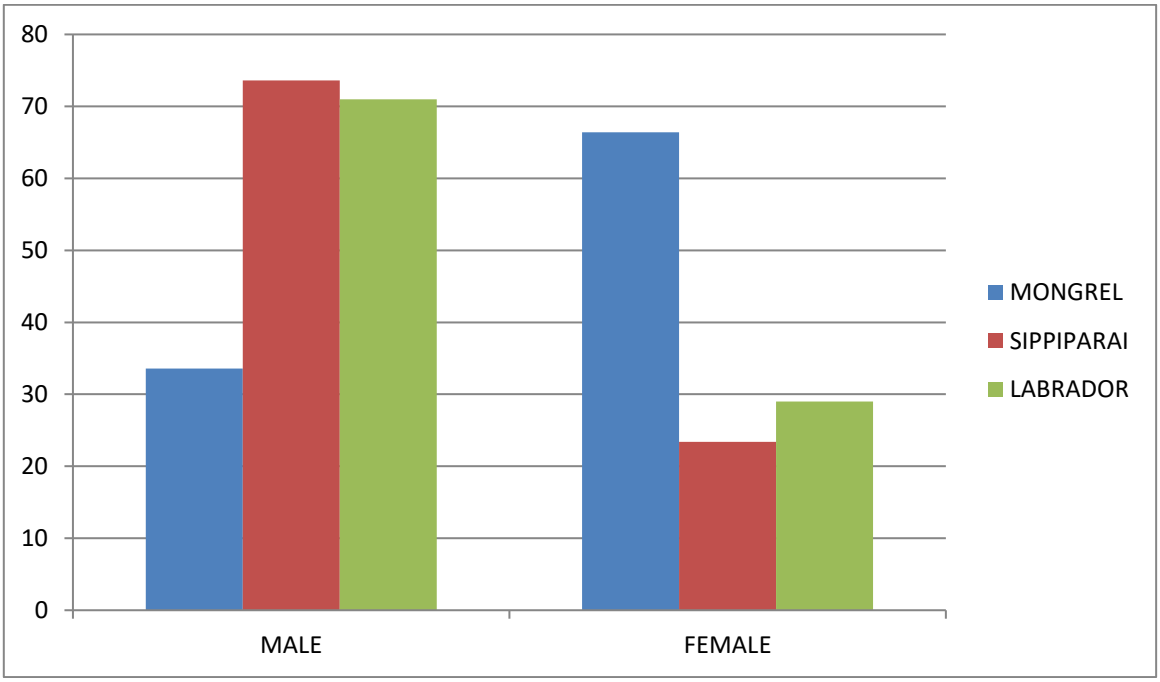
RESULTS:

GRAPH 1: AGE DISTRIBUTION BETWEEN THE SPORTING BREED OF DOGS



Graph 1 shows age distribution among the sporting breed in graphical representation. The graph illustrates that higher percentage of dogs were under age group of 25-36 months which were found in mongrel breed type of dogs.

GRAPH 2: GENDER DISTRIBUTION BETWEEN THE SPORTING BREED OF DOGS



Graph 2 shows gender distribution among the sporting breed in graphical representation. The graph illustrates that higher percentage of dogs were under males of sippiparai breed of dog.

TABLE 1: PERCENTAGE DISTRIBUTION OF ORAL HEALTH STATUS AMONG THE SPORTING BREEDS OF DOGS

S.No	Variables	mongrel breed	Sippiparai breed	Labrador breed	P-value
		%	%	%	
1	Systemic Disease	31.8	32.1	36.1	0.342
2	Teeth brushed	23.4	39.1	37.5	0.533
3	Gingivitis	50.9	25.4	23.7	0.014*
4	Oral lesions	21.0	53.5	25.5	0.093
5	Attrition	11.4	43.1	35.5	0.488
6	Missing teeth	20.0	40.1	39.9	0.451
7	Dental caries	31.8	32.5	35.7	0.392
8	Calculus	23.9	22.1	54.0	0.384
9	Stains	40.6	10.5	48.9	0.034*
10	Periodontitis	57.0	27.9	16.1	0.047*
11	Fractured teeth	49.4	26.5	25.1	0.058
12	Malocclusion	30.4	39.5	32.1	0.014*

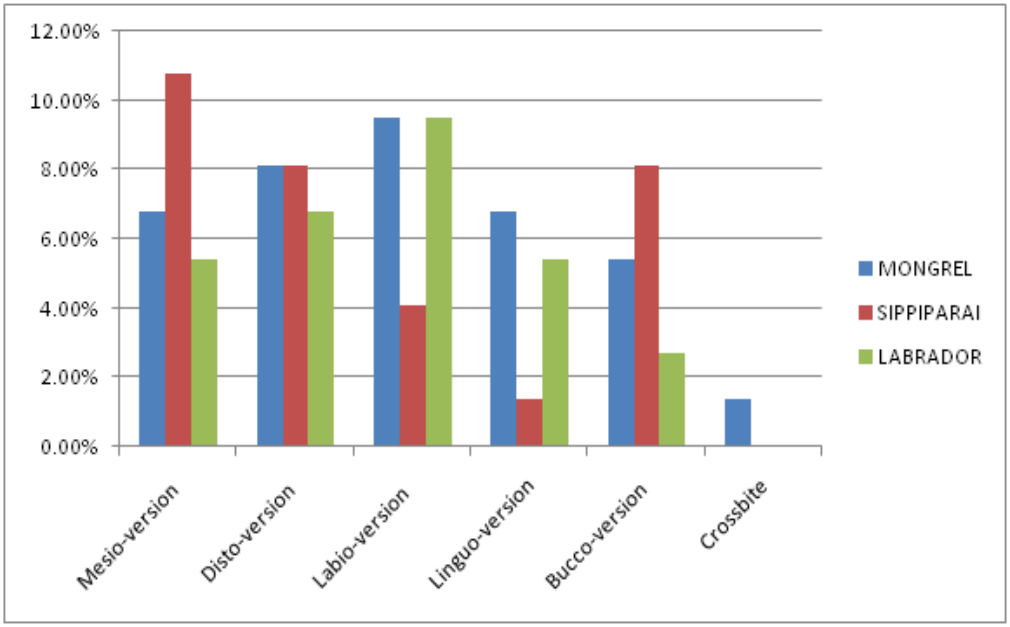
Table 1 shows the percentage distribution among the oral health status among the sporting breed of dog. Among the distribution, more percentage of oral health problems were reported in mongrel breed of dog as periodontitis followed by calculus in Labrador breed of dog. P value <0.05 was considered to be statistically significant. Significant difference was obtained among the gingivitis, stains, periodontitis and malocclusion among the sporting breed of dog.

TABLE 2: DISTRIBUTION OF MALOCCLUSION AMONG THE SPORTING BREED OF DOGS

S.No	Malocclusion	mongrel breed	Sippiparai breed	Labrador breed	P-value
1.	Mesio-version	6.8%	10.8%	5.4%	0.042*
2.	Disto-version	8.1%	8.1%	6.8%	
3.	Labio-version	9.5%	4.1%	9.5%	
4.	Linguo-version	6.8%	1.4%	5.4%	
5.	Bucco-version	5.4%	8.1%	2.7%	
6.	Crossbite	1.4%	0%	0%	

Table 2 shows the percentage distribution of malocclusion status among the sporting breed of dogs. Majority of percentage (10.8%) were seen among the sippiparai breed of Mesio-version malocclusion.

GRAPH 3: MALOCCLUSION STATUS BETWEEN THE SPORTING BREED OF DOGS



Graph 3 shows the percentage distribution of malocclusion status among the sporting breed of dogs. Lowest among them was seen among the mongrel breed of Crossbite malocclusion which was 1.4%

TABLE 3: DISTRIBUTION OF PERIODONTAL STATUS AMONG THE SPORTING BREED OF DOGS

S.No	Periodontal classification	mongrel breed	Sippiparai breed	Labrador breed	P-value
1.	Class 0	14.9%	9.5%	9.5%	0.074
2.	Class 1	13.5%	6.8%	13.5%	
3.	Class 2	12.2%.	6.8%	2.7%	
4.	Class 3	5.4%	0%	5.4%	

Table 3 shows the percentage distribution among the periodontal status among the sporting breed of dog. Among the distribution, majority were under the class 0 which was 14.9 % among the mongrel breed and least percentage were under Class 2 which was 2.7% among the Labrador breed

GRAPH 4: PERIODONTAL STATUS BETWEEN THE SPORTING BREED OF DOGS

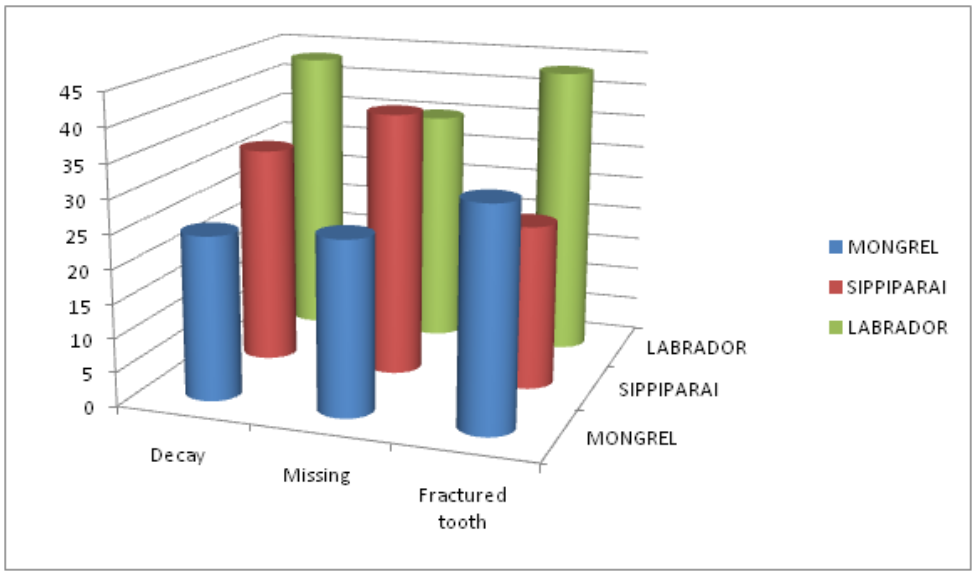
Graph 4 shows the periodontal status between the sporting breed of dogs. Majority of the distribution was found in mongrel breed of class 0 which was 14.9% and least was seen among the sippiparai breed of class 3 which was 0%.

TABLE 4: DISTRIBUTION OF DENTITION STATUS AMONG THE SPORTING BREED OF DOGS

S.No	Dentition status	Mongrel breed	Sippiparai breed	Labrador breed	P-value
1.	Decay	24.3%	32.4%	43.2%	0.052
2.	Missing	25.7%	39.2%	35.1%	0.013*
3.	Fractured tooth	32.4%	24.3%	43.2%	0.064

Table 4 shows the percentage distribution among the dentition status among the sporting breed of dog. Among the distribution, majority were under the labrador breed of decay status which was 43.2% and least were seen among the mongrel and sippiparai breed which were 24.3%.

GRAPH 5: DENTITION STATUS BETWEEN THE SPORTING BREED OF DOGS



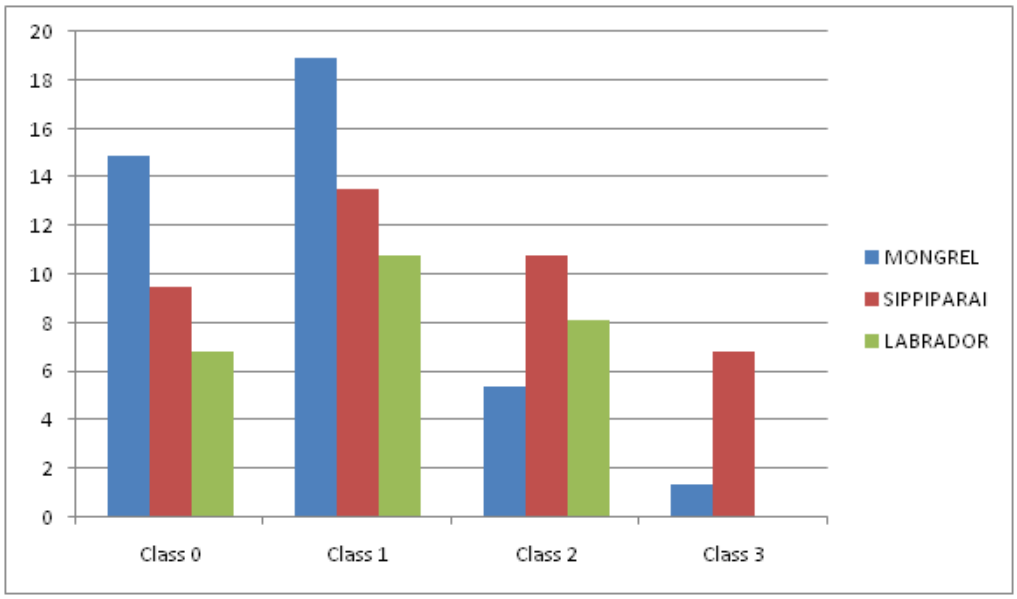
Graph 5 shows the dentition status distribution among the sporting breed of dogs. Majority of percentage distribution (43.2%) was seen among the labrador breed.

TABLE 5: DISTRIBUTION OF CALCULUS STATUS AMONG THE SPORTING BREED OF DOGS

S.No	Calculus classification	Mongrel breed	Sippiparai breed	Labrador breed	P-value
1.	Class 0	14.9%	9.5%	6.8%	0.089
2.	Class 1	18.9%	13.5%	10.8%	
3.	Class 2	5.4%	10.8%	8.1%	
4.	Class 3	1.4%	6.8%	0%	

Table 5 shows the percentage distribution among the calculus status among the sporting breed of dog. Among the distribution, majority were under the mongrel breed of class 1 which was 18.9%

GRAPH 6-: CALCULUS STATUS BETWEEN THE SPORTING BREED OF DOGS



Graph 6 shows the calculus status between the sporting breed of dogs. Least percentage were seen among the Labrador breed which was 0%.

Table: 6: DISTRIBUTION OF PLAQUE STATUS AMONG THE SPORTING BREED OF DOGS

S.No	Plaque classification	Mongrel breed	Sippiparai breed	Labrador breed	P-value
1.	Class 0	14.9%	8.1%	5.4%	0.085
2.	Class 1	13.5%	8.1%	8.1%	
3.	Class 2	5.4%	4.1%	5.4%	
4.	Class 3	10.8%	10.8%	5.4%	

Table 6 shows the percentage distribution among the plaque status among the sporting breed of dog. Among the distribution, majority were under the mongrel breed of class 0 which was 14.9% and least were seen among the mongrel, sippiparai and Labrador breed of class 2 and class 3 which was 5.4%.

GRAPH 7-: PLAQUE STATUS BETWEEN THE SPORTING BREED OF DOGS

Graph 7 shows the plaque status between the sporting breed of dogs. Majority of the distribution was found in mongrel breed of class 0 which was 14.9%.

DISCUSSION

In a common man's perspective there are only two types of dogs which are known, one is stray street dogs and the other one is pet dogs. But there are actually seven types of dog breeds which are classified based on their characteristics and intrinsic traits into different breeds. According to Carlisle et al[17] there can be more than ten types of disease which can occur in a dog's oral cavity.. The first sign a dog shows up is by avoiding its food while eating and whining. None of the dental disease can be cured at home by their owners. Any attempt done to solve the dental disease at home can result in further progression of the current dental condition. Dental disease should be treated only by a certified Veterinary dental practitioner. It is an era that was not only human beings but also animals are being affected by deadly diseases and sickness. Hence it is important for us, the owners, to keep our pets, the companions healthy and hygienic. We must take precautions in various ways to maintain their hygiene and health. Though general health is important, their oral health plays a significant role in maintaining hygiene. Among the animal species, dogs and cats are easily prone to dental health problems like Dental caries, plaque, and periodontitis, which are most commonly caused by Gram-negative anaerobic bacteria. At least a decent oral hygiene is essential to maintain a healthy oral cavity[18].

The first study was based on the beneficial effect of brushing in a dog's oral cavity. This study was conducted to determine which was effective for the dogs, brushing once daily or three times a day. It was shown within 48 working dog breeds. It was found that brushing once a day, 3 times a week, was a very suitable, sufficient, and laid-back way to maintain dogs' oral hygiene status[19]

Age factor play an important role in development of oral disease in dog breeds. Certain disease can only occur at certain ages of the dog, they are age related disease[13]. In this study we came up with the distribution of age in sporting breed of dogs. For the study, mongrel, sippiparai and Labrador breed of sporting breed dogs were assessed. Labrador records the highest participation in the age above 36 months. There were about 11.1% mongrel dogs in the age limit of 1 to 12 months. Labrador records the lowest participation in the age of 25 to 36 months. Whereas Labrador records the lowest participation in age of 25 to 36 months age limit. From the study, Labrador breed of dog shows no participation the age 1 to 12 months age group. And no mongrel breed of dog took place in the age group of 13 to 24 months category. Only sippiparai breed of sporting dog took place in the age group of above 36 months.

In the present study, the male gender distribution of the sporting breed of dogs was highest in the Labrador breed with 91.2% and the least was in the mongrel breed with 33.6%. In the female gender distribution, mongrel records the highest count with 66.4% and lowest was in the Labrador. In this, the dog breed with highest male count has the lowest female count participation and the breed with highest female dog participation has the lowest male dog participation.

The percentage distribution of oral health status among the sporting breed dogs were categorised by twelve various diseases. The systemic disease was found majority among the Labrador breed dogs. The teeth brushing in dog done by the owner were recorded highest among sippiparai dog breed of about 39.1%. Mongrel breed dog was found majority to have gingivitis and it found to be the least brushed dog breed in the study. It shows that dog which are least brushed are found to have the highest number of gingivitis cases. Oral lesion in dogs were recorded highest among the sippiparai dog breeds.. Missing tooth was found to be more in sippiparai breed of dog than the other breeds. Dental caries was recorded high among Labrador breed of dogs with only minor percentage of difference among other breeds. Calculus was recorded high among the Labrador breeds. Sippiparai was found to have lowest amount of stains among other breeds, sippiparai was also the height brushed dog breed among the study. This shows those dog breeds which were highly brushed had the lowest stains in the study. The mongrel breed is the one which are least brushed are also tend to have the high percentage in the gingivitis condition among the breeds in the study and also, they breed which has high gingivitis condition has the more amount of periodontal condition of about 57%. The fractured tooth is found more to be in the mongrel breed of more than 49.4%. The malocclusion condition is highly found in the sippiparai breed.

The association of oral health status between the sporting breeds of dog was also done in the study. In the study, the significant difference was found only in the gingivitis, stains, periodontitis and malocclusion among the sporting breed of dog in the study. The distribution of malocclusion among sporting breed of dogs were categorised into five categories. Mesio-version was highly seen in sippiparai breed of dog with about 10.8%. Disto-version was equally distributed in mongrel and sippiparai about 8.1%., labioversion is least seen in sippiparai of difference in percentage about 5.4%, linguoversion malocclusion is mostly seen in mongrel breed and Buccoversion is predominantly seen in sippiparai breed of dog of about 8.1%. Crossbite malocclusion was only seen in the mongrel breed of 1.4%. The mongrel breed of dog has the healthy class 1 periodontal condition than the other two breeds with difference of 5.4%. Class 2 stage of periodontal disease was found to be significantly less in sippiparai breed of variation about 6.7% class 3 periodontal disease appears to be lesser in labrador breed of dogs with much lesser value of 2.7%. There are no class 3 cases found in sippiparai breed of dog. The Labrador breed of dogs has high decayed and fractured tooth of same percentage of about 43.2%. Missing tooth is found to be more in sippiparai breed with 39.2%.

The calculus status of the sporting breed of dog was also recorded in the study. In this, the class 0 and class 1 are highly found in mongrel breed of about 14.9% and 18.9% respectively. Class 2 and class 3 index are found highly in the sippiparai breed with percentage of 10.8% and 6.8% respectively.

Plaque is the main source of calculus formation and thus plaque was also included in the study. The class 0 and class 1 plaque were found to be more in the mongrel breed of dog with percentage of about 14.9% and 13.5% respectively. Both the sippiparai and Labrador breed of dog has the same count of class 1 plaque. Class 2 plaque index was found equally in the mongrel and Labrador breed of 5.4%. Mongrel and sippiparai group of dog has the same number of class 3 count of about 10.8%. The limitation of the study is only a small number of samples were included in this study. Further longitudinal studies should be conducted to get more appropriate results. They is a higher chance of reporting bias in our study since the questions related to systemic disease and other demographic details were asked to the owner of the dog.

CONCLUSION

In the modern era, oral health status is also very important as it reflects the overall health. There was a positive association between the sporting breed of dog while assessing the malocclusion status and missing tooth status. A daily oral hygiene regimen should be a part of every breed of dog's routine and advising owners on suitable options available and helping them to improve the oral health status of dog is necessary.

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