Original Research Article

Hospital Prevalence of Infectious and Non-Infectious Diseases of Dogat Khulna, Bangladesh

ABSTRACT

Aims: The study was conducted to investigate the hospital prevalence of different infectious and non-infectious diseases of dog.

Place and duration of study: Data was collected from Khulna sadar upazilla veterinary hospital, Khulna pet clinic, Daulotpur veterinary hospital, Khulnabetween August 2022 and January, 2023.

Methodology: The study examines the prevalence of infectious (caused by pathogens) and non-infectious (caused by factors such as genetics, malnutrition, environment etc.) diseases of dog according to their sex, breed and age.

Results: A total number of 122 dogs were found during the investigation in which prevalence of infectious disease (65.57%) was higher than non-infectious disease (34.43%). The higher prevalence was found in female (54.10%) than male (45.9%) with no significance. According to breed, the highest prevalence was observed in Local breed (69.67%) followed by German shepherd (18.86%), Doberman (7.38%) and Labrador (4.10%). Age-wise prevalence was highest in 7-36 months (47.54%) age followed by >36 months (27.87%) and less than 6 months (24.60%). Age, sex, Breed showed a significant association with diseases with a *p*-value<0.05 in the study.

Keywords: Prevalence, Infectious disease, Breed, Season.

1. INTRODUCTION

Dogs are possibly the most well-known domestic pet on the earth [1].People prefer them as domestic animal companions because of their pleasing personality, helpful behavior, and natural instinct for affinity with humans. Canines are incredibly perceptive and can easily understand human behavior. Dogs are not only serving as companion but also act as workers [2]. A well-trained canine can do specific tasks in place of a skilled person. They are also used for a variety of public activities. Canine is utilized in the guard division to recognize enemy arms and position and in the police office to identify crimes and so on [3]. Dogs are the best canids, adjusted to human environment all over the world including Bangladesh.

They have added physical, social and psychological prosperity of their owners, especially kids [4]. Moreover, certain liabilitieslike appropriate housing facilities, disease management is connected with pet keeping [5]. Nevertheless, despite the useful impacts, close relation between human and dogs is considered to be a serious threat to public health as dogs may carry an uncountable number of infective stages of disease causal agents transmissible to human and other household animals[6]. Family pets have been found to play an immediate part in communicating zoonosis [7]. In rural areas of Bangladesh keeping dog as pet is not as popular as in city areas which is increasing day by day. Like other city areas, Dog rearing as pet is accelerating at Khulna city because it is a great way to spend time, companionship, recreation, pleasure and move away the monotony of daily life. Along with Local breeds, Doberman, Labrador, German shepherd and mixed breeds are also found commonly in Khulna city. Though rearing dog as pet is increasing rapidly, owners are not well aware about their management, vaccination schedule, diseases and related health hazards. So here dogs are more prone to be infected with different diseases usually. Since a few numbers of research was conducted a long time ago, there is no recent study about dog diseases in Khulna city. Therefore, a study was carried out to find the hospital prevalence of different infectious and non- infectious diseases of dog at Khulna Sadar area according to their sex, breeds and season of disease occurrences.

2. MATERIALS AND METHODS

The study has been done at KhulnaDistrict Veterinary Hospital, Khulna Pet Clinic and Daulotpur Veterinary Hospital.The mentioned three institutions are well known hospitals for pet treatment in Khulna city area.The study has been started from 1st August, 2022 and will be continued for 31st January, 2023, a total duration of six months that covers a portion of rainy season as well as winter season.The canines that have been brought into the hospitals by their owner are the target population of the study. Total number of 122dog has been found in the study period which both infectious(Canine Parvovirus disease, Canine Distemper, Dermatophytosis, Babesiosis, Rabies, Ecto parasitic disease etc.) and non-infectious (Fever, weakness, diarrhea, anorexia, alopecia, tumor, fracture, wound, Abscess etc.) cases were present there.During this study period data was collected from the register books of the Hospitals, from owner and examination of dogs including their history, age, breeds and vaccination status. The diagnostic procedures which were followed to diagnose the diseases are: Clinical history, Clinical sign, Clinical symptoms, Physical examination (Temperature, Respiration rate, Heart rate etc), Clinical Examination and Preferred treatment according to presumptive diagnosis.

Calculation of prevalence

Prevalence of the data will be calculated by the following formula-

Prevalence = (Number of the affected animal during study period) / (Total number of the animal admitted into hospital during study period) ×100.

All the data collected from register book and personal inspection were organized, structured and stored on excel spread sheet and analyzed through tabular and percentage. In the study, dogs were divided into three age groups as 0-6 months of age, 7-36 months of age and above 36 months of age. Differences between the case for age, gender and breed were compared with X^2 analysis which was performed with standard software (SPSS, version 24.0, SPSS Inc, Chicago, III); values of $p < 0.05$ were considered significant.

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3. RESULTS ANDDISCUSSIONS

The diseases of dog were categorized into two types after diagnosis- Infectious and Non-infectious. A total number of122 dogs came to hospitals for treatment, among them 80 dogs were found affected with different infectious agent and 42 dogs were found affected without any agent.

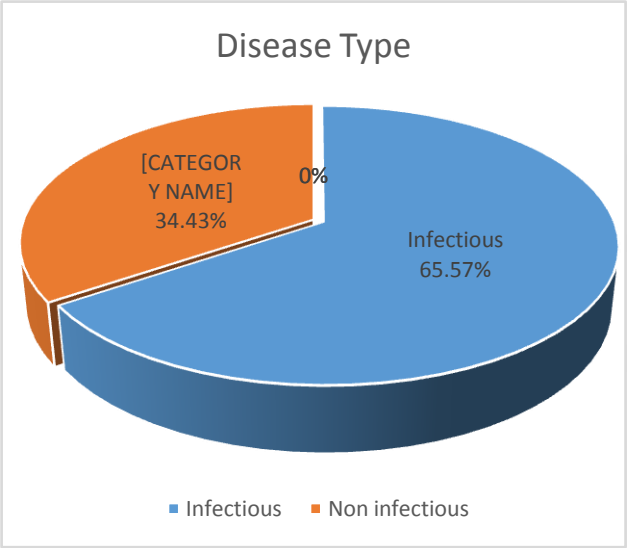

Figure 1: Graphical presentation of infectious and non-infectious disease.

Prevalence of infectious disease is found 65.57% whereas prevalence of non-infectious is found 34.43% in the current study.

Among the total study population of 122 dogs, the 80 dogs were found under infectious disease category. There was total 6 types of disease were diagnosed presumptively and some mixed infections were found in this category namely canine parvovirus disease, canine distemper disease, dermatophytosis, Babesiosis, Rabies and parasitic infestation. The other 42 dogs were categorized under non-infectious disease according to their general body condition and sign-symptoms.Clinical findings of the investigated infectious diseases by which they are diagnosed are demonstrated below:

Table 1: Clinical Findings of the investigated infectious diseases in the study

Name of disease	Causal agent	Clinical findings
Canine distemper disease	○ Canine distemper virus	✓ Conjunctivitis, Rhinitis, pneumonia. ✓ Diarrhea, vomiting, fever. ✓ Ataxia, Hyperesthesia, paresis. ✓ Enamel Hypoplasia. ✓ Hyperkeratosis.
Canine parvovirus disease	○ Canine parvovirus	✓ Fever, Depression. ✓ Vomiting with or without

		blood. ✓ Diarrhea with or without blood with a very foul odor. ✓ Crying, gasping for breath.
Dermatophytosis	○ *Microsporum Canis* ○ *Microsporum gypseum* ○ *Trichophyton mentagrophytes*	✓ Circular patches of alopecia. ✓ Pruritus with annular, popular and pastular lesion. ✓ "Cigarette-ash" like crust. ✓ Exudative furunculosis. ✓ Depigmentation of nose.
Rabies	○ Rabies virus	✓ Restlessness and irritability. ✓ Voice is altered. ✓ Bumps into object. ✓ Chew and swallow stones, wood, carpet and straw. ✓ Attempted to bite other animal or people. ✓ Jaw and eyelids drops, barking. ✓ Hydrophobia.
Ecto- parasite	○ *Sarcoptes scabei* ○ *Dermodex canis*	✓ Scabies was found in ear margins, elbows, hocks and abdominal area. ✓ Pinnal-pedal reflex.
Babesiosis	○ *Babesia canis* ○ *Babesia gibsoni*	✓ Fever with increased pulse and respiration rate. ✓ Listlessness, irregular appetite. ✓ onstipation. ✓ Ocular and nasal discharge. ✓ Icteric condition.

3.1 Prevalence of diseases in different sex

In total population, female was most susceptible (54.10%) rather than male (45.90%). Study did not show any significant relation between diseases and sex (p-value 0.409).

Table 2: Sex-wise Prevalence(%) of the diseases in dogs

Disease name		**Male no. (%)**	**Female no. (%)**	**Total (%)**	***P*- Value**
Infectious Disease	Canine Distemper	8(6.56)	4(3.28)	12(9.84)	X^2= 7.191 ***P***= 0.40
	Canine Parvovirus	12(9.84)	17(13.93)	29(23.77)	
	Dermatophytosis	11(9.02)	12(9.84)	23(18.86)	
	Rabies	3(2.46)	1(0.82)	4(3.28)	
	Ecto parasite	2(1.64)	3(2.46)	5(4.10)	
	Babesiosis	1(0.82)	-	1(0.82)	
	Mixed infection	1(0.82)	5(4.10)	6(4.92)	
Miscellaneous non-infectious disease		18(14.75)	24(19.67)	42(34.43)	
Overall		56(45.90)	66(54.10)	122(100)	

X^2 = Chi-squared value, $P \leq 0.05$ indicate a significant association

3.2 Prevalence of diseases in different breed

In total population, there were four different breeds namely Doberman (9), German shepherd (23), Labrador (5)and Local breed (85) records were found.Among these, local breed had the highest prevalence of 69.67% followed by German shepherd 18.86%, Doberman 7.38% and Labrador breed 4.10%. There was the statistically significant relation of diseases in response to breed with a p-value0.001.

Table 3: Breed-wise Prevalence (%) of diseases in dogs

Disease name		Doberman no. (%)	German Shepherd no. (%)	Labrador no. (%)	Local no. (%)	Total	*P*-Value
Infectious Disease	Canine Distemper	2(1.64)	4(3.28)	2(1.64)	4(3.28)	12(9.84)	X^2= 45.78 ***P*** = 0.001
	Canine Parvovirus	3(2.46)	7(5.74)	-	19(15.57)	29(23.77)	
	Dermatophytosis	-	5(4.10)	-	18(14.75)	23(18.86)	
	Rabies	-	-	-	4(3.28)	4(3.28)	
	Ecto parasite	-	1(0.82)	-	4(3.28)	5(4.10)	
	Babesiosis	-	-	1(0.82)	-	1(0.82)	
	Mixed Infection	-	1(0.82)	1(0.82)	4(3.28)	6(4.92)	
Miscellaneous non-infectious disease		4(3.28)	5(4.10)	1(0.82)	32(26.23)	42(34.43)	
Overall		9(7.38)	23(18.86)	5(4.10)	85(69.67)	122(100)	

X^2 = Chi-squared value, ***P***-value≤ 0.05 indicate a significant association

3.3 Prevalence of diseases in different age groups

There arethree age groups(up to 6 months, 7-36 months and over 36 months) in the study. the prevalence was found highest in the group of 7-36 months 47.54% followed by over 36 months of age 27.87% and up to 6 months age 24.60%. Study shows a significant relation between diseases and age groups, where p- value is 0.027.

Table 4: Age-wise Prevalence (%) of diseases in dogs

Disease name		Up to 6 months no. (%)	7-36 months no. (%)	Over 36 months no. (%)	Total no. (%)	*P*- Value
Infectious Disease	Canine Distemper	7(5.74)	5(4.10)	-	12(9.84)	X^2= 25.86 ***P***= 0.02
	Canine Parvovirus	11(9.02)	14(11.48)	4(3.28)	29(23.77)	
	Dermatophytosis	3(2.46)	13(10.66)	7(5.74)	23(18.86)	
	Rabies	-	3(2.46)	1(0.82)	4(3.28)	
	Ecto parasite	-	1(0.82)	4(3.28)	5(4.10)	
	Babesiosis	-	-	1(0.82)	1(0.82)	
	Mixed Infection	1(0.82)	3(2.46)	2(1.64)	6(4.92)	
Miscellaneous non-infectious disease		13(10.66)	17(13.93)	12(9.84)	42(34.43)	

Overall	30(24.60)	58(47.54)	34(27.87)	122(100)

X^2 = Chi-squared value, ***P*** ≤ 0.05 indicate a significant association

4. DISCUSSIONS

This study reported the most prevalent dog diseases in Khulna city area of Bangladesh as infectious disease and miscellaneous non-infectious diseases. The current study was designed to fill a critical data gap relating to disorder prevalence information(miscellaneous non-infectious disease group) that has been identified as a constraint to improve dog welfare [8,9,10].

Overall diseases in dogs, prevalence of infectious diseases (65.57%) was higher than miscellaneous non-infectious diseases (34.43%) shown at table 1. Among the infectious diseases, parvovirus infection (23.17%) showed highest prevalence followed by Dermatophytosis (18.86%), Canine distemper (9.89%), Mixed infections (4.92%), Parasitic infestation (4.10%) etc. From the estimation of the study, parasitic infestation shows lower prevalence than the findings by Hossainet al. [11] that revealed thehighest prevalence is in parasitic infestation (40.048%)and deworming the dogs were the main reason of lower prevalence rate here.

The sex wise highest prevalence of diseases in dog was observed in the female (54.10%) than male (45.90%) which is nearly in accordance with a previous report by Hossain et al.[11]that also showed prevalence in female (57.416%) is higher than in male (42.584%). However, the findings of the present study are not supported by Islam et al. [12] that reported female dogs having lower prevalence.

The highest prevalence of diseases in dog was found in local breed (69.67%), followed German shepherd (18.86%), Doberman (7.38%), Labrador (4.10%) which is supported by both Hossain et al. [11] and Mahmud et al.[13] but German shepherd showed a higher prevalence in an earlier study by Sarker et al. [14]. It may be because of different topographic region and a variation in environment in Khulna. However, studyshowed a significant association between breeds with diseases (p=0.001).

Prevalence of diseases according to age group in my study was highest at 7-36 months (47.54%) age followed by >36 months (27.87%) and less than 6 months (24.60%). Current study is dissimilar with the findings of Islam et al. [12] who found highest prevalence in >36 months age groups but Soumitra et al.[15] reportedthat the highest prevalence of dog diseases is higher in more than 18 months of age. Age groups of the dogs have showna significant association with diseases (*p=0.027*)shown at table 4.

CONCLUSION

It is concludedthat increasing number of disease and disorder in dogs is a great challenge for rearing them as pet in Khulna city. By increasing more public awareness through different voluntary campaign about housing facilities of dogs, vaccination schedule, disease management and therapeutic management of those diseases will be helpful to prevent diseases, ensure the good health of the dog, minimize health hazards to owner and will inspire them to keep dogs as their trustable company.Moreover, this study may help the veterinarians to be more cautious about the most occurring disease in Khulna city and to be prepared for the needed treatment and vaccination accordingly. Further extensive studies are necessary to design in this regard.

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