

Research Article



Disease Prevalence and Therapeutics of Pet Dogs at Central Veterinary Hospital (CVH), Bangladesh

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Abstract | Keeping dogs as pets is increasing in Bangladesh; however, they may be infected by several diseases as well as pose a serious health hazard to pet owners through the transmission of zoonotic diseases. This study aimed to investigate the disease prevalence and drug use among pet dogs at the Central Veterinary Hospital (CVH) in Bangladesh. Ninety (90) pet dogs that were brought to the CVH were the subjects of a two-month cross-sectional prospective study that took place between July and August of 2022. Patient owners' complaints, clinical disease histories, and patient clinical examinations were used to diagnose the clinical diseases. The most common clinical diseases in dogs were viral infections (55.56%), followed by bacterial infections (17.78%), other diseases (10%), fungal infections (8.89%), and parasitic infestations (7.78%) ($p < 0.001$). Among them, canine parvovirus (28.89%) and viral fever (18.89%) were more common than other illnesses ($p < 0.001$). Crossbreeds had the highest occurrence of clinical diseases (about 29%), followed by German shepherd breeds (24%), local breeds (20%), Labrador breeds (13%), Pug breeds (9%), and Doberman breeds (5%) ($p < 0.001$). Male dogs had a higher percentage of clinical cases (about 69% vs. 31%) than female dogs ($p < 0.001$). Dogs aged seven months to three years had a higher percentage of reported clinical cases (62%) than dogs of other ages ($p < 0.001$). Breed, sex, and age all had a substantial impact on the disease categories ($p < 0.05$). In pet dogs, ceftriaxone was the most often prescribed antibiotic. The results of this study offer interesting information about the most common diseases in pet dogs and the drugs used for the treatment of them.

Keywords | Age, antibiotics, breed, clinical diseases, pet dogs, sex

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INTRODUCTION

Dogs may be the most frequent household pets in the world, having adapted to live with humans in every country, including Bangladesh (Chomel, 2014; Hossain et al., 2022; Ansari-Lari and Oroji, 2023). They have improved the social, emotional, and physical health of their owners—especially the younger ones (Dohoo et al., 1998; Robertson et al., 2000; Leonard et al., 2012). Dogs belong to the family Canidae and order Carnivora. *Canis familiaris* is the official designation for the domesticated dog. There are about 400 breeds of *Canis familiaris*, ranging in

size and shape from the tiny teacup chihuahua to the large Irish wolfhound (Dysko et al., 2002).

In Bangladesh, keeping pets is becoming more and more common. For passing the time during their leisure, people are concerned about taking care of pets especially dogs (Hossain and Kayesh, 2014; Garoma and Diba, 2022). Nevertheless, despite the positive outcomes, the intimate relationship between dogs and people continues to pose a serious risk to public health since dogs act as reservoirs of infectious disease agents that can be transferred to humans and other household animals (Robertson et al., 2000;

William et al., 2002; Molyneux, 2004; Colella et al., 2020; Ng-Nguyen et al., 2020; Kouamo et al., 2021; Mendoza Roldan and Otranto, 2023). According to Tarafder and Samad, (2010), at least 36 significant zoonotic diseases are acquired from dogs globally. Although Bangladesh has been linked to the presence of several significant zoonotic diseases acquired from dogs, there are nevertheless relatively few inland reports on this subject. Consequently, it is necessary to look into diseases in dogs, particularly in Dhaka, due to the presence of a large number of pet population. While studies on the clinical diseases in pets have been conducted in various parts of Bangladesh (Tarafder and Samad, 2010; Mahmud et al., 2014; Parvez et al., 2014; Yadav et al., 2017; Hasib et al., 2020; Hossain et al., 2022), there is comparatively little information available regarding the prevalence and associated risk factors of these conditions in dogs in Dhaka city. Furthermore, right choice of drugs is the key to treat clinical diseases. Keeping all the points in our mind, the goal of the current study was to ascertain the prevalence, associated risk factors as well as drug usage of clinical diseases in pet dogs that were brought to the Central Veterinary Hospital (CVH) in Dhaka to receive medical attention.

MATERIALS AND METHODS

RESEARCH AREA AND DURATION

The study was employed 90 pet dogs that were brought to the Central Veterinary Hospital (CVH) in Dhaka between July and August of 2022. All the animals were registered in the patient registered book, including breed, age, sex, and complaint of the owners.

METHODS OF DIAGNOSIS OF DISEASES

The complaints of patient owners, clinical disease histories, and patient clinical examinations were considered as the basis for the clinical evaluations of diseased animals. Diagnosis of clinical diseases was carried out based on clinical signs and reported symptoms, rather than diagnostic tests (Tarafder and Samad, 2010). Moreover, a thorough medical history, including vaccination status, travel, food, and environmental history, as well as information about any possible intoxication sources was taken carefully from the owners.

STATISTICAL ANALYSIS

Each patient's data was gathered and entered into Microsoft Excel (Microsoft Office Excel-2013, USA). Using the Minitab17 software (Minitab Ltd., UK), the Pearson's Chi-square test was used to evaluate all of the study's data. A significance level of $p < 0.05$ was assigned to differences.

RESULTS AND DISCUSSION

PREVALENCE OF CLINICAL DISEASES OF PET DOGS AT CVH

Ninety clinical cases of dogs were recorded at CVH, Dhaka, Bangladesh, during the period from July to August 2022. The prevalence of clinical diseases in dogs according to disease name and categories are presented in Figure 1 and Figure 2, respectively. The most common clinical case during the study period was canine parvovirus (28.89%), followed by viral fever (18.89%), salmonellosis (14.44%), dermatomycosis (8.89%), canine distemper (6.67%), lice infestation (5.56%), malnutrition (5.56%), gastritis (4.44%), leptospirosis (3.33%), mite infestation (2.22%), and rabies (1.11%) (Figure 1) ($p < 0.001$). According to disease categories, the highest prevalence was found in viral diseases (55.56%), followed by bacterial diseases (17.78%), miscellaneous diseases (10%), fungal diseases (8.89%), and parasitic infestation (7.78%) (Figure 2) ($p < 0.001$). Islam et al. (2019) conducted a similar study; however, they reported viral diseases as the second highest clinical cases (23.37%) after parasitic diseases (25.37%). Parvez et al. (2014) and Yadav et al. (2017) also conducted similar studies; however, prevalence varies among all the above-mentioned studies, which might be due to the demography and the period of studies. Sultana et al. (2016) reported that canine parvovirus infection was the second-highest clinical disease in pet dogs (15.95%), which was next to skin diseases (18.69%). However, in this study, the most prevalent clinical diseases in dogs were viral diseases, especially canine parvovirus, and viral fever, which may be due to not vaccinating the dogs or vaccination failure. Furthermore, the low prevalence of parasitic diseases and dermatitis observed in the present study indicates the carefulness of the pet's owners. Association of disease categories with breed, age, and sex of pet dogs.

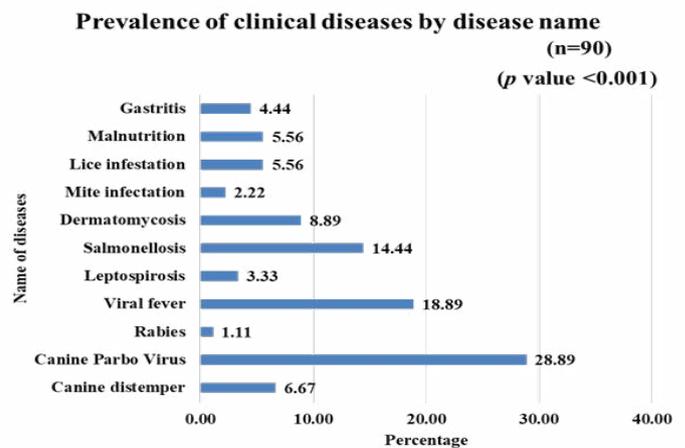


Figure 1: Prevalence of clinical diseases of dogs according to name of diseases at CVH.

Prevalence (%) of clinical diseases by disease categories

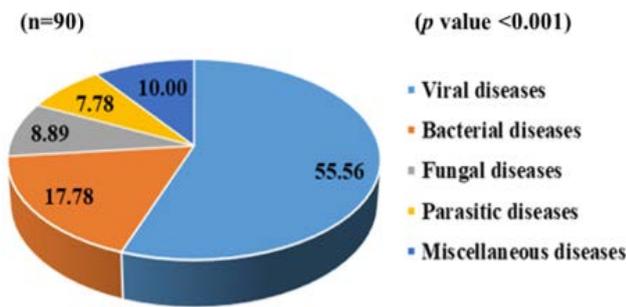


Figure 2: Prevalence of clinical diseases of dogs according to diseases categories at CVH.

Figure 3 shows the prevalence of clinical disorders in dogs by age, sex, and breed. At CVH (Figure 3A) ($p < 0.001$), the breeds showed different degree of clinical diseases where approximately 29% in Cross breed, approximately 24% in German Shepherd, approximately 20% in Local breed, approximately 13% in Labrador, approximately 9% in Pug, and approximately 5% in Doberman. This is consistent with the earlier research conducted by Mahmud et al. (2014) and Islam et al. (2019). Viral diseases were the most common disease category among German shepherds, the local breed, and Crossbreeds when compared to other breeds ($p < 0.05$); nonetheless, Cross breeds had the highest prevalence of viral infections relative to other breeds ($p < 0.05$) (Table 1). This research suggests that breed significantly affects clinical diseases in pet dogs.

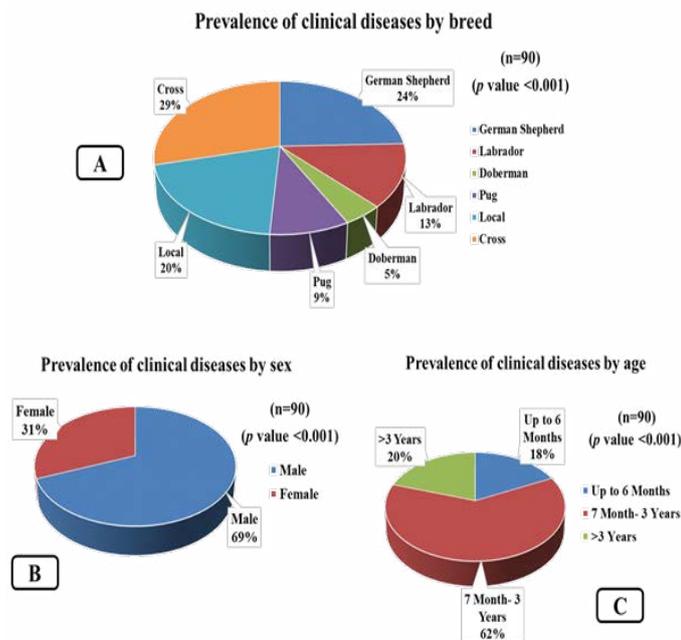


Figure 3: Prevalence of clinical diseases of dogs according to breed (A), sex (B) and age (C).

Male dogs had a higher prevalence of clinical cases (about

69% vs. 31%) compared to female dogs (Figure 3B) ($p < 0.001$). Out of all the disease categories, viral diseases were the most common in both males and females ($p < 0.05$); nevertheless, males were more likely than females to have viral diseases (Table 2). The results of Yadav et al. (2017), who found that male dogs had a greater illness prevalence than female dogs (58.72% vs 41.28%), corroborated this finding. According to this research, sex significantly affects the relationship between illness and pet dogs.

Dogs aged seven months to three years had higher reported clinical cases (62%) than dogs older than three years (20%) and dogs less than six months (18%) (Figure 3C) ($p < 0.001$). In every age group, viral infections were the most common disease category ($p < 0.05$). With the exception of miscellaneous disorders ($p < 0.05$), dogs aged 7 months to 3 years had a higher prevalence of all disease categories (Table 3). Similarly, dogs older than six months had a higher risk of developing clinical diseases (68.02% vs. 31.98%) than dogs younger than six months, according to Yadav et al. (2017). Additionally, young dogs had a reduced proportion of clinical cases (17.55%), according to Tarafder and Samad (2010). Young dogs may have fewer infections because of the extensive attention their pet owners provide for them. This discovery implies that the occurrence of clinical illnesses in domestic dogs is influenced by age.

PATTERN OF DRUGS USAGE FOR THE TREATMENT OF CLINICAL DISEASES OF PET DOGS

Various medications, including antibiotics, antihistamines, NSAIDs (non-steroidal anti-inflammatory medicines), antifungals, anthelmintic agents, vitamins, and minerals, were utilized for therapeutic purposes. Table 4 displays the findings of the medication use pattern for the treatment of clinical diseases in dogs. Ceftriaxone, a third-generation cephalosporin, was the most often given antibiotic (90%). As an anthelmintic and an antihistamine, pheniramine maleate and ivermectin were suggested, respectively. Meloxicam was the NSAID that was utilized the most after tolfenamic acid. When it comes to treating fungal infections, griseofulvin and fluconazole are equally useful. The best supplements were combinations of vitamins and minerals. According to Hasib et al. (2020), the most commonly prescribed antibiotic for pets was ceftriaxone. The types of clinical conditions influence the medications selected for therapeutic usage.

To sum up, pet dogs came to CVH to receive treatment for various clinical conditions. In dogs, viral infections seemed to be the most common clinical condition. Age, sex, and breed can affect the likelihood of developing clinical illnesses. NSAIDs, anthelmintics, antifungals, antihistamines, and various antibiotics were utilized therapeutically.

Table 1: Association of clinical diseases of dogs between disease categories and breed.

| Disease categories | German Shepherd | Labrador | Doberman | Pug | Local | Cross | p value |
|------------------------|-----------------|----------|----------|----------|------------|------------|---------|
| Viral diseases | 12 (13.33) | 5 (5.56) | 3 (3.33) | 4 (4.44) | 10 (11.11) | 17 (17.78) | 0.007 |
| Bacterial diseases | 4 (4.44) | 3 (3.33) | 0 (0.00) | 1 (1.11) | 3 (3.33) | 5 (5.56) | 0.261 |
| Fungal diseases | 4 (4.44) | 2 (2.22) | 0 (0.00) | 0 (0.00) | 2 (2.22) | 0 (0.00) | 0.075 |
| Parasitic diseases | 0 (0.000) | 1 (1.11) | 1 (1.11) | 0 (0.00) | 3 (3.33) | 2 (2.22) | 0.320 |
| Miscellaneous diseases | 2 (2.22) | 1 (1.11) | 0 (0.00) | 3 (3.33) | 0 (0.00) | 3 (3.33) | 0.275 |
| p value | 0.001 | 0.323 | 0.075 | 0.083 | 0.003 | <0.001 | |

Table 2: Association of clinical diseases of dogs between disease categories and sex.

| Disease categories | Male | Female | p value |
|------------------------|------------|------------|---------|
| Viral diseases | 34 (37.78) | 16 (17.78) | 0.011 |
| Bacterial diseases | 11 (12.22) | 5 (5.56) | 0.134 |
| Fungal diseases | 6 (6.67) | 2 (2.22) | 0.157 |
| Parasitic diseases | 6 (6.67) | 1 (1.11) | 0.059 |
| Miscellaneous diseases | 5 (5.56) | 4 (4.44) | 0.739 |
| p value | <0.001 | <0.001 | |

Table 3: Association of clinical diseases of dogs between disease categories and age.

| Disease categories | Up to 6 Months | 7 Month- 3 Years | >3 Years | p value |
|------------------------|----------------|------------------|------------|---------|
| Viral diseases | 10 (11.11) | 30 (33.33) | 10 (11.11) | <0.001 |
| Bacterial diseases | 3 (3.33) | 11 (12.22) | 2(2.22) | 0.010 |
| Fungal diseases | 1 (1.11) | 6 (6.67) | 1 (1.11) | 0.044 |
| Parasitic diseases | 0 (0.00) | 6 (6.67) | 1 (1.11) | 0.012 |
| Miscellaneous diseases | 2 (2.22) | 3 (3.33) | 4 (4.44) | 0.717 |
| p value | 0.001 | <0.001 | 0.003 | |

Table 4: Percentage of drugs used for treatment of diseases of dogs.

| Name of the drugs | Generic name | Percentage of Usage (%) |
|---------------------------------|--|-------------------------|
| Antibiotics | Amoxicillin | 5 |
| | Ampicillin | 5 |
| | Ceftriaxone (3 rd generation) | 90 |
| Anti-histamines | Pheniramine maleate | 100 |
| NSAIDs | Tolfenamic acid | 60 |
| | Meloxicam | 40 |
| Antifungals | Griseofulvin | 50 |
| | Fluconazole | 50 |
| Anthelmintic | Ivermectin | 100 |
| Vitamin and Mineral Supplements | Vitamin+minerals | 90 |
| | Multivitamins | 10 |

Therefore, through routine immunization and appropriate cleanliness measures, pet owners should take precautions to avoid or decrease viral infection.

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CONFLICT OF INTEREST

The authors have declared no conflict of interest.

This study revealed that the disease categories in pet dogs are influenced by age, sex, and breed. It also showed that the most widely prescribed antibiotic for dogs is ceftriaxone.

AUTHORS CONTRIBUTION

Sharma SK, Rahman ANMI, and Islam M conceived and designed the experiments. Sharma SK collected data after clinical examinations. Rahman ANMI and Islam M performed statistical analyses. Sharma SK and Islam M wrote the first draft of the manuscript. The final draft of the manuscript has been read by all authors and approved.

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