

## PREVALENCE AND RISK FACTORS ASSOCIATED WITH CLINICAL CASES OF PET ANIMALS IN DHAKA CITY, BANGLADESH

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### ABSTRACT

This study aimed to determine the prevalence of most common clinical cases of dog, cat and rabbit reported at MM Hossain's Pet Clinic, Dhaka, Bangladesh. One thousand and two hundred (n=1200) clinical cases were recorded during the period from March 2020 to July 2022. Among them, dog, cat, and rabbit covered 21%, 65.5% and 12.5% cases, respectively. Parasitic disease was the highest prevalent case (25%) in dogs followed by gastritis (11.51%), wound (10.71%), dermatitis (7.54%), conjunctivitis (6.75%), and kennel cough (5.16%) ( $p<0.001$ ). Likewise, parasitic disease followed by wound, viral disease, and diarrhea were the more prevalent clinical cases in cats (23.31%, 18.05%, 6.77%, and 5.64%, respectively) ( $p<0.001$ ). In case of rabbit, traumatic injuries and fracture was the highest reported case (16.67%) followed by parasitic infestation, diarrhea, and dermatitis (13.33%, 13.33%, and 12.00%, respectively) ( $p<0.001$ ). Clinical cases were more prevalent in male dogs than female dogs (56.75% vs 43.25%) ( $p<0.05$ ), and dogs more than 6 months of age had more reported clinical cases compared to 1-6 months of aged dogs (65.08% vs 34.92%) ( $p<0.05$ ). Local breed of cats showed higher prevalence of clinical cases than that of cross breed (66.54% vs 33.46%), male cats had higher prevalence compared to female cats (59.40% vs 40.60%), and cats at the age of 1-6 months represented higher prevalence than those more than 6 months of age (62.16% vs 37.84%) ( $p<0.05$ ). Male rabbits represented as higher reported clinical cases than female rabbits (72.67% vs 27.33%) ( $p<0.05$ ). Overall, Parasitic infection/infestation was the prominent reported clinical cases in pet dogs, cats, and rabbits. Proper prevention and therapeutic management should be carrying out to reduce the prevalence of parasitic diseases of pets.

**Key words:** clinical cases, pet animals, prevalence, risk factors

### INTRODUCTION

Day by day rearing pets is becoming very popular in Bangladesh. People care about caring for pets like dogs, cats and rabbits for passing their free time (Hossain and Kayesh, 2014). The tendency to keep companion animals is increasing daily among the people of modern society. Pets have become an essential part of the family, and are repeatedly considered as family members (Yadav *et al.*, 2017). In many households, pet animals contribute to the physical, social and mental well-being of children and their owners (Dohoo *et al.*, 1998; Robertson *et al.*, 2000; Parvez *et al.*, 2014). Dogs are serving as a companion and act as a workforce (Singh *et al.*, 2014). Dogs and cats are the most frequent household pets around the world, but there are also many other vertebrates that share our household environment (Chomel *et al.*, 1992). Pets keeping is usually related with certain responsibilities like housing, disease management and responsible for pet ownership with negative consequences for public health when neglected (William *et al.*, 2002). Pets some times are responsible for the transmission of zoonotic pathogens to human (Dada *et al.*, 1979; Robertson *et al.*, 2000; Molyneux, 2004). Since 19<sup>th</sup> century, rabbits became as pets in western nations. Recently, rabbit makes a mutual relationship with its owners through better understanding.

Several clinical diseases frequently affect pets. Among them, the viral diseases such as rabies, infectious canine hepatitis, canine distemper, canine parvovirus infections, feline Panleukemia, and feline calici viral infections are very common in the Indian sub-continent like Bangladesh (Biswas *et al.*, 1996; Samad, 2011). Bacterial diseases such as leptospirosis, brucellosis, kennel cough, clostridial infection etc are more common in pets. Furthermore, household pets are playing an important role in transmitting zoonotic diseases (Kornblatt and Schantz 1980; Plant *et al.*, 1996; Geffray, 1999).

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Therefore, clinical diseases of pets especially in Dhaka city, the highest number of pets rearing city, is needed to investigate. Though the incidence of clinical diseases and conditions of pet animals has already been performed in different areas of Bangladesh (Tarafder and Samad, 2010; Mahmud *et al.*, 2014; Parvez *et al.*, 2014; Yadav *et al.*, 2017). However, the prevalence of clinical diseases in pet animals in Dhaka city is less documented. It was reported earlier that the overall prevalence of clinical diseases in the Dhaka city area in dogs, cats and rabbits were 71.50%, 18.70% and 9.80% respectively (Runa *et al.*, 2016). However, the risk factors associated with the clinical cases of pets were not understood well. Therefore, this study conducted to know the prevalence of clinical diseases of pet animals in Dhaka city, Bangladesh along with the assessment of risk factors affected systems of the body and the etiology of pet diseases.

## MATERIALS AND METHODS

### Research Area and Duration

The study was carried out in Dr. MM Hossain's Pet Clinic at Dhaka city from the period of March 2020 to July 2022. A total of 1200 cases were examined during the study period out of them 252 were dogs, 798 were cats and 150 were rabbits. The clinical examinations of diseased animals were performed on basis of complaints of owners of patients, history of clinical diseases and clinical examinations of patients.

### Data Collection

The data were collected according to the owner's complaints, visual examinations like body condition, behavior, gesture, posture, skin lesions, salivation, nasal and ocular discharge, distension of the abdomen, locomotors disturbances etc.

### Determination of Age of Animals

The age of individual animals was determined by interviewing the Owners of the animals and the examination of teeth of animals.

### Methods of diagnosis of diseases

Based on the history from owners, physical examination, clinical signs and clinical examination of animals, the presumptive diagnosis of different diseases or clinical cases were performed.

### Study Design

Clinical cages of three different groups of animals such as dogs, cats and rabbits were noted down.

### Clinical examination of patient:

Distant inspection started with the observation of the general attitude of the patient such as attentiveness, dullness, depression, and anorexia attentively inspected. After that, normal and abnormal posture and gait examined according to the condition of the dog, cat, and rabbit. Close inspection of the animals performed by the visual examination. Separation of hairs, light palpation and close direct inspection was performed to detect hair, coat and skin abnormalities. Skin lesions, nature of lesions such as foul odorous discharge, crusts, scale and dandruff, location and distribution of those lesions also performed. In addition, external parasites like ticks, lice, fleas, flies and larvae of flies identified during the close inspection.

### Physical examination

For the identification of wounds first of all visual inspection was performed and then categorizing the wound whether it septic, lacerated, incised, punctured, perforating, abrasions or hematoma for a more precise diagnosis. In required cases, needle punctures were also conducted. Visual inspection of pulse rate, respiration and rectal temperature was recorded and then different organs and systems of the body of animals were performed by using palpation, percussion and auscultation. Mouth gag and local anaesthesia were also used for the clinical examination of the animals. Extension and flexion, and needle puncture were also performed when required.

### Laboratory diagnosis

Faecal samples and skin scrapings were examined with a compound microscope at the department of Microbiology and Parasitology of Sher-e-Bangla Agricultural University (SAU), Dhaka. Collected

blood and urine samples were tested at the department of Anatomy, Histology and Physiology of SAU, Dhaka for routine and specific diagnosis. X-Ray or imaging was performed at Teaching and Training Pet Hospital and Research Centre at Purbachal, Dhaka to diagnose the musculoskeletal and chest diseases in required cases.

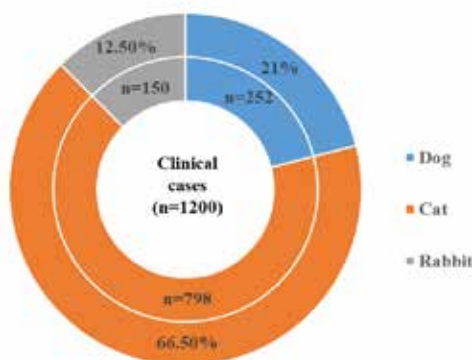
#### Statistical analysis

The data collected from each patient were entered into MS Excel (Microsoft office excel-2013, USA). All data obtained from this study were analyzed by Pearson's Chi-square test using the Minitab17 program (Minitab Ltd., UK). Significant differences were declared as  $p < 0.05$ .

## RESULTS AND DISCUSSION

### Prevalence of various clinical cases in pet dogs, cats and rabbits

Twelve hundred (1200) cases of different clinical cases were recorded in Dr. MM Hossain's Pet Clinic in Dhaka city, Bangladesh during the period from March 2020 to July 2022. The overall prevalence of clinical cases was 21.00%, 66.50% and 12.50% in dogs, cats and rabbits, respectively (Fig. 1). A similar study was conducted by Yadav *et al.* (2017), who reported that the overall proportional prevalence of clinical diseases and disease conditions in dogs, cats and rabbits were 44.32%, 34.28% and 21.39% respectively. Sarker *et al.* (2015) further reported that the overall proportional prevalence of clinical diseases in dogs and cats was 75.00% and 25.00%, respectively. The variation of finding among different studies might be due to other study areas and periods.



In this study, parasitic disease was the highest prevalent case (25%) in dogs followed by gastritis (11.51%), wound (10.71%), dermatitis (7.54%), conjunctivitis (6.75%), and kennel cough (5.16%) ( $p < 0.001$ ) (Table 1). Likewise, parasitic disease followed by wound, viral disease, and diarrhea were the more prevalent clinical cases in cats (23.31%, 18.05%, 6.77%, and 5.64%, respectively) ( $p < 0.001$ ) (Table 2). In case of rabbit, traumatic injuries and fracture was the highest reported case (16.67%) followed by parasitic infestation, diarrhoea, and dermatitis (13.33%, 13.33%, and 12.00%, respectively) ( $p < 0.001$ ) (Table 3). The findings of this study is in agreement with Parvez *et al.* (2014) who reported more parasitic cases in dogs (51.54%) and cats (54%). Yadav *et al.* (2017) further reported the parasitic diseases as the most frequent clinical cases in dog (24.42%) and cat (23.31%), while traumatic injuries and fracture was higher in rabbits (16.87%). In contrast, Sarker *et al.* (2015) reported low prevalence of parasitic diseases, which were 14.77% in dogs and 13.33% in cats. The reason might be due to performing de-worming reported by Sarker *et al.* (2015).

**Table 1. Occurrence of clinical cases of pet dogs according to their breed, sex and age.**

Cases	Overall			Breed				Sex				Age						
	No.	%	p-value	Local		Cross		p-value	Male		Female		p-value	>6 Months		p-value		
				No.	%	No.	%		No.	%	No.	%		No.	%			
Diarrhoea	15	5.95		8	3.17	7	2.78	0.796	8	3.17	7	2.78	0.796	8	3.17	7	2.78	0.796
Gastritis	19	11.51		17	6.75	12	4.76	0.353	18	7.14	11	4.37	0.194	7	2.78	22	8.73	0.005
Pneumonia	6	2.38		3	1.19	3	1.19	1.000	3	1.19	3	1.19	1.000	6	2.38	0	0.00	0.014
Kennel cough	13	5.16		5	1.98	8	3.17	0.405	8	3.17	5	1.98	0.405	8	3.17	5	1.98	0.405
Dermatitis	19	7.54		11	4.37	8	3.17	0.491	11	4.37	8	3.17	0.491	4	1.59	15	5.95	0.012
Conjunctivitis	17	6.75		5	1.98	12	4.76	0.090	9	3.57	8	3.17	0.808	4	1.59	13	5.16	0.029
Otitis	9	3.57		7	2.78	2	0.79	0.096	5	1.98	4	1.59	0.739	0	0.00	9	3.57	0.003
Canine distemper/Hepatitis	5	1.98		3	1.19	2	0.79	0.655	4	1.59	1	0.40	0.180	0	0.00	5	1.98	0.025
Bacterial diseases	12	4.76		7	2.78	5	1.98	0.564	8	3.17	4	1.59	0.248	6	2.38	6	2.38	1.000
Parasitic diseases	63	25.00	<0.001	34	13.49	29	11.51	0.529	36	14.29	27	10.71	0.257	20	7.94	43	17.06	0.004
Protozoal diseases	2	0.79		2	0.79	0	0.00	0.157	2	0.79	0	0.00	0.157	0	0.00	2	0.79	0.157
Fungal diseases	6	2.38		2	0.79	4	1.59	0.414	4	1.59	2	0.79	0.414	0	0.00	6	2.38	0.014
Endometritis & pyometra	4	1.59		3	1.19	1	0.40	0.317	0	0.00	4	1.59	ND	0	0.00	4	1.59	ND
Pregnancy detection	4	1.59		2	0.79	2	0.79	1.000	0	0.00	4	1.59	ND	0	0.00	4	1.59	ND
Wound	27	10.71		20	7.94	7	2.78	0.012	16	6.35	11	4.37	0.336	16	6.35	11	4.37	0.336
Abscess	2	0.79		2	0.79	0	0.00	0.157	2	0.79	0	0.00	0.157	2	0.79	0	0.00	0.157
Neuter	5	1.98		2	0.79	3	1.19	0.655	5	1.98	0	0.00	ND	0	0.00	5	1.98	ND
Parvo virus	7	2.78		2	0.79	5	1.98	0.257	4	1.59	3	1.19	0.705	7	2.78	0	0.00	0.008
Spaying	7	2.78		3	1.19	4	1.59	0.705	0	0.00	7	2.78	ND	0	0.00	7	2.78	ND
<b>Total</b>	<b>252</b>	<b>100.00</b>	-	<b>138</b>	<b>54.76</b>	<b>114</b>	<b>45.24</b>	<b>0.131</b>	<b>143</b>	<b>56.75</b>	<b>109</b>	<b>43.25</b>	<b>0.032</b>	<b>88</b>	<b>34.92</b>	<b>164</b>	<b>65.08</b>	<b>&lt;0.001</b>

ND= not done; No.= Number, %= percentage

Table 2. Occurrence of clinical cases of pet cats according to their breed, sex and age.

Cases	Overall			Breed			Sex			Age						
	No.	%	p-value	Local		Cross		Male		Female		>6 Months				
				No.	%	No.	%	No.	%	No.	%	No.	%			
Diarrhoea	45	5.64		27	3.38	18	2.26	24	3.01	21	2.63	35	4.39	10	1.25	<0.001
Gastitis	33	4.14		20	2.51	13	1.63	22	2.76	11	1.38	20	2.51	13	1.63	0.223
Pneumonia	36	4.51		24	3.01	12	1.50	20	2.51	16	2.01	26	3.26	10	1.25	0.008
Urinary disorder	8	1.00		5	0.63	3	0.38	6	0.75	2	0.25	0	0.00	8	1.00	0.005
Poisoning	30	3.76		22	2.76	8	1.00	18	2.26	12	1.50	22	2.76	8	1.00	0.011
Dermatitis	28	3.51		18	2.26	10	1.25	16	2.01	12	1.50	8	1.00	20	2.51	0.023
Conjunctivitis	24	3.01		12	1.50	12	1.50	14	1.75	10	1.25	15	1.88	9	1.13	0.221
Otitis	24	3.01		14	1.75	10	1.25	14	1.75	10	1.25	14	1.75	10	1.25	0.414
Bacterial diseases	24	3.01	<0.001	15	1.88	9	1.13	16	2.01	8	1.00	4	0.50	20	2.51	0.001
Viral diseases	54	6.77		40	5.01	14	1.75	36	4.51	18	2.26	44	5.51	10	1.25	<0.001
Parasitic diseases	186	23.31		132	16.54	54	6.77	114	14.29	72	9.02	126	15.79	60	7.52	<0.001
Protozoal diseases	21	2.63		15	1.88	6	0.75	14	1.75	7	0.88	16	2.01	5	0.63	0.016
Fungal diseases	21	2.63		12	1.50	9	1.13	12	1.50	9	1.13	16	2.01	5	0.63	0.016
Pregnancy detection	12	1.50		12	1.50	0	0.00	0	0.00	12	1.50	0	0.00	12	1.50	ND
Orthopedic surgery	54	6.77		36	4.51	18	2.26	36	4.51	18	2.26	42	5.26	12	1.50	<0.001
Wound	144	18.05		102	12.78	42	5.26	82	10.28	62	7.77	108	13.53	36	4.51	<0.001
Spaying	24	3.01		10	1.25	14	1.75	0	0.00	24	3.01	0	0.00	24	3.01	ND
Neuter	30	3.76		15	1.88	15	1.88	30	3.76	0	0.00	0	0.00	30	3.76	ND
<b>Total</b>	<b>798</b>	<b>100.00</b>	-	<b>531</b>	<b>66.54</b>	<b>267</b>	<b>33.46</b>	<b>474</b>	<b>59.40</b>	<b>324</b>	<b>40.60</b>	<b>496</b>	<b>62.16</b>	<b>302</b>	<b>37.84</b>	<b>&lt;0.001</b>

ND= not done; No.= Number, %= percentage

**Table 3. Occurrence of clinical cases of pet rabbits according to their breed, sex and age.**

Cases	Overall			Sex				Age				
	No.	%	p-value	Male		Female		1-6 months		>6 Months		p-value
				No.	%	No.	%	No.	%	No.	%	
Diarrhoea	20	13.33		14	9.33	6	4.00	13	8.67	7	4.67	0.180
Dermatitis	18	12.00		13	8.67	5	3.33	10	6.67	8	5.33	0.637
Pneumonia	12	8.00		9	6.00	3	2.00	9	6.00	3	2.00	0.083
Conjunctivitis	8	5.33		6	4.00	2	1.33	4	2.67	4	2.67	1.000
Coccidiosis	12	8.00		10	6.67	2	1.33	8	5.33	4	2.67	0.248
Poisoning	4	2.67	<0.001	2	1.33	2	1.33	3	2.00	1	0.67	0.317
Parasitic infestation	20	13.33		15	10.00	5	3.33	8	5.33	12	8.00	0.371
Alopecia	10	6.67		7	4.67	3	2.00	4	2.67	6	4.00	0.527
Traumatic injuries and fracture	25	16.67		19	12.67	6	4.00	16	10.67	9	6.00	0.162
Abscess	5	3.33		3	2.00	2	1.33	2	1.33	3	2.00	0.655
Others	16	10.67		11	7.33	5	3.33	7	4.67	9	6.00	0.617
<b>Total</b>	<b>150</b>	<b>100.00</b>	-	<b>109</b>	<b>72.67</b>	<b>41</b>	<b>27.33</b>	<b>84</b>	<b>56.00</b>	<b>66</b>	<b>44.00</b>	<b>0.142</b>

ND= not done; No.= Number, %= percentage

## **Influence of breed, sex and age on the prevalence of clinical cases in pet animals**

Clinical cases were more prevalent in male dogs than female dogs (56.75% vs 43.25%) ( $p < 0.05$ ), and dogs more than 6 months of age had more reported clinical cases compared to 1-6 months of aged dogs (65.08% vs 34.92%) ( $p < 0.05$ ) (Table 1). Our findings are supported by Yadav *et al.* (2017) who revealed that clinical cases were higher in male than female dogs (58.72% vs 41.28%), and in dogs, more than 6 months compared to dogs less than 6 months of age (68.02% vs 31.98%). The findings of this study further are in partial agreement with the report of Tarafder and Samad (2010) who stated that the prevalence of clinical cases was higher in old (48.12%) followed by adults (34.33%) and young dogs (17.55%). The local breed of cats showed a higher prevalence of clinical cases than that of crossbreed (66.54% vs 33.46%), male cats had a higher prevalence compared to female cats (59.40% vs 40.60%), and cats at the age of 1-6 months represented higher prevalence than those more than 6 months of age (62.16% vs 37.84%) ( $p < 0.05$ ) (Table 2). Likewise, Yadav *et al.* (2017) showed that clinical cases of cats were higher in males (58.65%), in the local breed (79.70%), and in cats less than 6 months of age (51.13%). Male rabbits represented higher reported clinical cases than female rabbits (72.67% vs 27.33%) ( $p < 0.05$ ) (Table 3). This finding is in agreement with the results of Yadav *et al.* (2017) who reported more clinical cases in male than female rabbits (71.11% vs 22.88%). Likewise, Sarker *et al.* (2015) and Parvez *et al.* (2014) reported that male rabbits had higher clinical cases than female rabbits. The reason for higher recorded clinical cases in male dogs, cats, and rabbits might be due to the preference of males as pets by the pet owners to avoid the unnecessary stress of special care and management hazard for female pets during the gestation period along with the reproductive noise. Wound infection was reported as a higher percentage in male dogs compared to female dogs ( $p < 0.05$ ). This is due to the movement of male dogs are more frequent than female dogs. Parasitic diseases, gastritis, dermatitis, conjunctivitis, otitis, canine distemper/hepatitis, and fungal diseases were more prevalent in dogs more than 6 months of age; however, pneumonia, and parvovirus infection showed higher prevalence in 1-6 months of aged dogs ( $p < 0.05$ ). The reasons behind of this, some diseases are age specific. Parasitic diseases, wound infection, viral diseases, orthopaedic surgery, pneumonia, poisoning, and protozoal diseases were more reported in local breed cats compared to cross-breed cats ( $p < 0.05$ ). Male cats were more prone to parasitic diseases, viral diseases, and orthopaedic surgery than female cats ( $p < 0.05$ ). The more reported clinical cases of cats at the age of 1-6 months were parasitic diseases, wound infection, viral diseases, orthopaedic surgery, diarrhoea, poisoning, protozoal diseases, and fungal diseases; however, dermatitis, bacterial diseases, and urinary disorder were more prevalent in cats more than 6 months of age ( $p < 0.05$ ). Most of the pets Owners who have the high social standard they rear crossbred animals and so they medicate their pets properly as compared with others. Our study further reported that male rabbits were more prone to traumatic injuries and fracture, parasitic infestation, and coccidiosis compared to female rabbits ( $p < 0.05$ ). This is because of movement of male rabbits are more as compared with the female rabbits. All the pets such as dogs, cats, and rabbits of this study were infected with parasitic infections or infestations, which might be associated with poor hygiene and not performing regular de-worming. In conclusion, pet dogs, cats, and rabbits were infected by different clinical diseases and conditions along with the increased number of voluntary surgery in Dhaka city, Bangladesh. Parasitic infections and/or infestations appeared as the most significant clinical disease in all pets. Therefore, care should be taken by pet owners to prevent or reduce parasitic infection and/or infestation through regular deworming and good hygiene practices.

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