

A retrospective study on pet diseases and their medical interventions in Xi'an, China

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Abstract: Background: Number of pets in China is tremendously increasing due to urbanization and rapid development of economy, and in 2010 more than 100 million pets were reported in China. Infectious diseases in pets show great concern on human health due to close contacts; therefore, it is very important to study pet diseases and their medical intervention. **Objectives:** Objectives of present study were to diagnose and treat different diseases caused by various infectious agents among hospital admitted pet animal patients, especially dogs and cats. **Methods:** Present study was conducted from September 15th, 2011 to September 14th, 2013 in university teaching pet hospital in Xi'an, and a total of 613 out of nearly 700 cases were selected for study. Pet diseases were classified into various categories on the basis of condition by organ systems. **Results:** 583 dog cases (95.11%) and only 30 cat cases (4.89%) were reported. 13 predominant diseases were analyzed, respiratory disorders (15.99%, 98/613) were common in dogs (15.61%, 91/583) and cats (23.33%, 7/30); followed by skin disease (dermatitis) (14.85%, 91/613), canine parvovirus disease (14.36%, 88/613) and gastrointestinal disease (12.56%, 77/613). **Conclusions:** Respiratory disorders, skin disease (dermatitis), canine parvovirus disease and gastrointestinal diseases were common and were highly prevalent in autumn. Antibiotics, especially broad-spectrum were widely applied. Data source was limited and each case could not be followed up, however, these kinds of studies are important in better understanding of pet health situation and in promoting rational veterinary medical interventions and rational policies in veterinary public health.

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1. Introduction

The companion animals have been becoming an important part of modern society and their population has also been tremendously increased in China. Nearly 25% Chinese keep pets, and in 2010 more than 100 million pets in China were reported and more than half of them were dogs (Meng, 2010). With the rapid development of economy and urbanization in China, the number of companion animals is continuously increasing. Nevertheless, the pet diseases have becoming one of the major veterinary public health concerns and showing growing impact on human health due to the close contacts between humans and pets. Therefore, a better understanding of the distribution and classification of pet diseases and their medical interventions could be the basis of promoting rational veterinary applications, and will also provide useful reference to public health sector.

2. Material and Methods

Study Area: The study was conducted in the university teaching pet hospital located in Xi'an, the capital city of Shaanxi province, China. The Xi'an city is in the geographical center of China with four distinct seasons and with all-year average temperature

of 13.5°C. The population of Xi'an is approximately 8.4 million with middle level socio-economic development. The chosen university pet hospital has been the biggest and most modern pet hospital in northwestern China with well qualified veterinarians and well-equipped facilities.

The Records: A total of 613 out of nearly 700 cases were selected with confirmed diseases and complete medical history, from September 15th, 2011 and September 14th, 2013. The selection criteria were (i) if a pet was prescribed repeatedly for the same disease, it was recorded as one case with one prescription (the prescription given at the first day of hospitalization) and (ii) the selected cases must contain full information including pet breed (of both the species i.e. dogs and cats), type of disease and prescribed drug(s) or medical intervention(s). Furthermore, the diseases were classified into different categories on the basis of disease conditions by organ systems. The fluctuations in case numbers of top four diseases (diseases of respiratory tract, skin diseases (dermatitis), canine parvovirus disease and gastrointestinal diseases) in each season were recorded.

3. Results

3.1. Analysis on basis of types of pet diseases

Only two kinds of pet species i.e., dogs and cats, have been frequently admitted in hospital during the study period. Majority of the cases were dogs, 95.11% (583 cases) and, however, small number of cat cases were also recorded, 4.89% (30 cases).

As shown in Table 1, a total of 13 types of predominant diseases were analyzed from 613 cases. Respiratory disorders (15.99%, 98/613) were the most common diseases in dogs (15.61%, 91/583) and cats (23.33%, 7/30), following with skin disease (dermatitis) (14.85%, 91/613), canine parvovirus disease (14.36%, 88/613) and gastrointestinal disease (12.56%, 77/613). However, the prevalence of benign neoplasm was very low (0.49%, 3/613). Specific diseases and case numbers of each disease are summarized in Table 1.

3.2. Analysis of prescriptions for major diseases

Nine frequently used therapeutic drugs in 5 predominant diseases are listed in Table 2, and supportive therapies such as Dextrose, Vitamins and Calcium preparation, access to fresh water, restriction to exercise were also commonly used in some treatments (data not shown).

As shown in Figure 1, the Ceftriaxone, a broad-spectrum and third generation cephalosporin antibiotic was the most frequent used antibiotic in the studied pet hospital.

4. Discussions

In our present study only two pet species were investigated i.e., dogs and cats, and majority of the cases (95.11%) were dogs. The findings in our study are in agreement with the data from other countries (Mani and Maguire, 2009) that have complete pet diseases structures; but on contrary we showed simple pet structure in Xi'an and implies the owner's orientation in pet choosing. Different pet structures in the societies lead to different pet health situations and require different pet health resources and policies. Diseases such as celiac disease and benign neoplasm were not recorded in cats, probably due to the small number of cat patients.

According to our observations, the proportion of infectious diseases (influenza, upper respiratory tract infections, pneumonia, fungus infections, *demodex*, *sarcoptes scabiei*, skin abscesses, canine parvovirus disease, gastroenteritis, diarrhea, *babesiosis*, *coccidian*, *tapeworm*, *toxocariasis*, canine distemper and eye inflammation) within 613 cases was considerably high (60.85%). Canine parvovirus, influenza virus, canine distemper virus

and *babesiosis* were the most common infectious pathogens in dogs; followed by fungus, coccidian and tapeworm the common zoonotic infections in dogs, cats and human. Among the non-infectious diseases the gastrointestinal disorders and physical trauma were the most common recorded cases, while only three neoplasm cases were recorded, and intriguingly no cancer case was recorded. However, in the US and Australia the most common diseases occurring in dogs and cats are musculoskeletal, dental disease, diseases of gastrointestinal tract and obesity (Freeman et al, 2006). These differences indicate that the structure of pet diseases in China is quite different from developed countries. These differences might be due to the high prevalence of recorded diseases in China, unvaccination, high medical treatment cost, different pet public health situation and/or probably due to different attitudes, knowledge and behaviors of pet owners towards pet diseases, especially diabetes, cancers and obesities.

Furthermore, it was observed that seasonal variations also play significant role in the prevalence of diseases in pets as high prevalence of diseases was recorded in May (71 cases) and September (91 cases), while lowest cases were recorded in January (33 cases) and December (34 cases), (Figure 2). Certain different types of medicines were included in pet treatment regime, however, yet surgery was also performed in some particular cases such as fractures, pyometra, dystocia, urethral stone, hernia and neoplasm.

The antimicrobial resistance in companion animals is an emerging problem and data of antimicrobials used curing the diseases in pets is significantly important in the development of national policies to control antimicrobial resistance. In our study, it was recorded that broad-spectrum antibiotics were widely used and our findings are consistent with recent studies from Australia, Italy, Finland and UK (Watson and Maddison, 2001; Rantala et al, 2004; Thomson et al, 2009; Escher et al, 2011; Mateus et al, 2011). The extensive use of ceftriaxone, a relatively expensive third-generation cephalosporin antibiotic might be due to the high safety and high efficiency of the drug and might also be interest based by the pet hospital. However, widespread usage of broad-spectrum antibiotics can be an indicator of wrong diagnosis of clinical conditions, thus might lead to rapid spread of antimicrobial resistance. Therefore, better awareness of rational antibiotics use in pet health sector should be further addressed and the programs of rational antibiotic use should also be better designed.

Table 1. The distribution of each systematic disease in dogs and cats

Classification of diseases	Diseases	Number of cases			Rate of disease (%)
		Dogs	Cats	Total	
Respiratory disorder	Influenza	66	7	73	74.49
	Asthma	9	0	9	9.18
	Upper respiratory tract infection	6	0	6	6.12
	Tracheal collapse	5	0	5	5.1
	Pneumonia	3	0	3	3.06
	Tracheostenosis	2	0	2	2.04
				98	
Dermatitis	Fungus infection	40	5	45	49.45
	<i>Demodex</i>	19	0	19	20.88
	<i>Sarcoptes scabies</i>	18	0	18	19.87
	Skin abscesses	9	0	9	9.89
				91	
Canine parvovirus disease	Canine parvovirus disease	88	0	88	100
				88	
Gastrointestinal disease	Dyspepsia	16	0	16	20.78
	Gastroenteritis	11	2	13	16.88
	Constipation	13	0	13	16.88
	Gastric dilatation	12	0	12	15.58
	Diarrhea	8	0	8	10.39
	Foreign body	5	1	6	7.79
	Twisted intestines	6	0	6	7.79
	Anal-gland disease	3	0	3	4
				77	
Traumatism	Fracture	33	2	35	50.73
	Wound	32	0	32	46.38
	Arthritis	2	0	2	2.9
				69	
Parasite disease	Babesiasis	20	0	20	44.44
	Coccidian	10	1	11	24.44
	Tapeworm	10	0	10	22.22
	Toxocariasis	4	0	4	8.89
				45	
Canine distemper	Canine distemper	39	0	39	100
				39	
Nutritional&metabolic disease	Liver failure	18	2	20	66.67
	Hypocalcaemia	5	5	10	33.33
				30	
Genitourinary disorder	Pyometra	8	1	9	33.33
	Dystocia	6	2	8	26.66
	Urethral stone	8	0	8	26.66
	Renal failure	2	0	2	7.41
				27	
Cardiovascular disease	Hypertension	12	0	12	54.55
	Anemia	4	1	5	22.72
	Heart disease	5	0	5	22.72
				22	
Celiac disease	Seroperitoneum	10	0	10	58.82
	Celiocele	7	0	7	41.18
				17	
Eye disease	Eye inflammation	6	1	7	100
				7	
Benign neoplasm	Mammary neoplasm	3	0	3	100
				3	

Note: Rate of disease (%) means the proportion of the case number of each definite disease in its classification. For instance, Influenza (73) represented 74.49% of all cases of respiratory disorders (98).

Table 2. The major medicines used in the treatment of 6 common pet diseases

Canine Parvovirus Disease (n=88)			Influenza (n=73)			Parasitic diseases (n=45)			Fungal infection (n=45)			Canine distemper (n=39)		
Drug	Frequency	Rate (%)	Drug	Frequency	Rate (%)	Drug	Frequency	Rate (%)	Drug	Frequency	Rate (%)	Drug	Frequency	Rate (%)
CPV McAb ^a	88	100	Anisodamine	49	67.12	Anisodamine	25	55.56	econazole nitrate	20	44.44	CDV McAbb	39	100
Interferon-γ	88	100	Ceftriaxone	42	57.53	Ceftriaxone	25	55.56	Griseofulvin	19	42.22	Interferon-γ	39	100
Anisodamine	88	100	Interferon-γ	21	28.77	Tilmicosin	22	48.89	Amoxicillin	15	33.33	siRNA anti-virus injection	39	100
Ceftriaxone	82	93.18	Azithromycin	15	20.55	Febantel	18	40	Cefixime	15	33.33	Anisodamine	28	71.79
siRNA anti-virus injection	81	92.05	Cefixime	11	15.07	Toltrazuril	16	35.56	Aspirin	12	26.67	Ceftriaxone	28	71.79
Aspirin	13	14.77	siRNA anti-virus injection	10	13.7	Antondine Injection	12	26.67	Otomax	10	22.22	Aspirin	23	58.97
Azithromycin	5	5.68	Aspirin	10	13.7	Aspirin	10	22.22	Aminopyrine	10	22.22	Azithromycin	10	25.64
Ampicillin	4	4.55	Amoxicillin	9	12.33	Interferon-γ	10	22.22	Ceftriaxone	8	17.78	Amoxicillin	9	23.08
Amoxicillin	4	4.55	Ampicillin	8	10.96	Plato ^c	8	17.78	Anisodamine	5	11.11	Bavirin	4	10.26

^a CPV McAb: Canine Parvovirus Monoclonal Antibody; ^b CDV McAb: Canine Distemper Monoclonal Antibody; ^c Plato: A brand name mainly contains praziquantel and albendazole

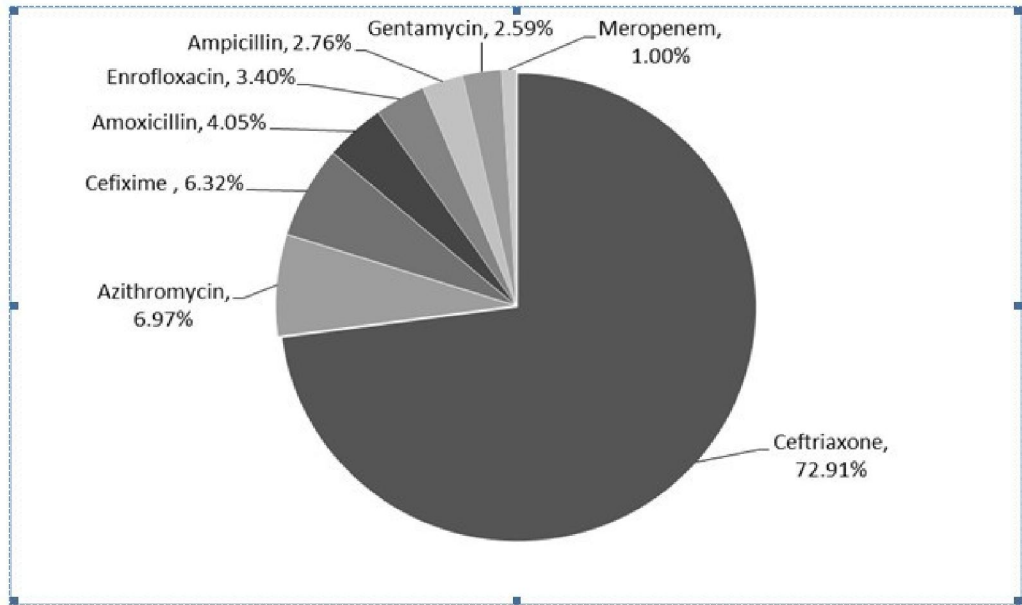


Figure 1. Proportion of each antibiotic used in treatment

Note: totally 8 kinds of antibiotics were used in 604 cases for 617 times (Any antibiotics applied no matter once or multiple times in each case is considered “one time used” here). Ceftriaxone was the most frequent used antibiotic in many different diseases with the usage rate of 72.91% (456/617) in all antibiotics. Some antibiotics, such as Amoxicillin, could be applied in different dosage forms, yet considered as one types of antibiotic here.

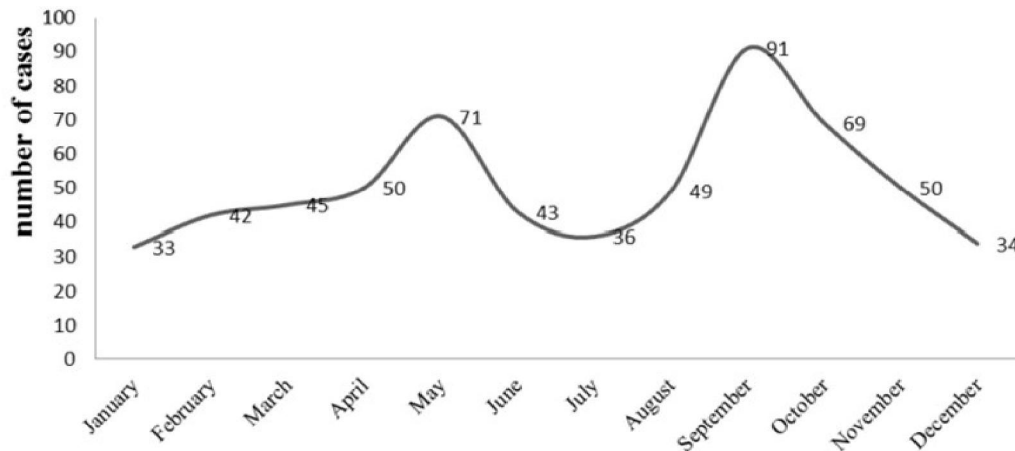


Figure 2. The distribution of 613 cases in each month

Conclusions

To our knowledge, the present study is the first systemic investigation on pet diseases structure and treatment in China. The occurrence of the respiratory disorders, skin disease (dermatitis), canine parvovirus disease and gastrointestinal diseases were most common among pets and higher prevalence was recorded in autumn. Broad-spectrum antibiotics were widely applied and the Ceftriaxone was the most frequently prescribed antibiotic. Although the data source was limited and we could not follow up the treatment effect of each case, however, such kind of investigations are important in better understanding of pet health situation and in promoting rational medical interventions and rational policies in veterinary public health.

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References

1. Meng G. Current situation and development prospect of pet industry in China. Qinghai. *J Ani Vet* 2010; 40: 38-40.
2. Mani L and Maguire, JH. Small animal zoonoses and immunocompromised pet owners. *Top. Companion. Anim Med* 2009; 24: 164-74.
3. Freeman LM, Abood SK, Fascetti AJ, Fleeman LM, Michel KE, Laflamme DP, Bauer C, Kemp BL, Doren Van JR, Willoughby KN. Disease prevalence among dogs and cats in the United States and Australia and proportions of dogs and cats that receive therapeutic diets or dietary supplements. *J Am Vet Med Assoc* 2006; 229: 531-34.
4. Watson AD, Maddison JE. Systemic antibacterial drug use in dogs in Australia. *Aust Vet J.* 2001; 79: 740-46.
5. Rantala M, Hölsö K, Lillas A, Huovinen P, Kaartinen L. Survey of condition-based prescribing of antimicrobial drugs for dogs at a veterinary teaching hospital. *Vet. Rec* 2004;155: 259-62.
6. Thomson KH, Rantala MH, Viita-Aho TK, Vainio OM, Kaartinen LA. Condition- based use of antimicrobials in cats in Finland: results from two surveys. *J Feline Med Surg* 2009; 11: 462-66.
7. Escher M, Vanni M, Intorre L, Caprioli A, Tognetti R, Scavia G. Use of antimicrobial in companion animal practice: a retrospective study in a veterinary teaching hospital in Italy. *J Antimicrob Chemother* 2011; 66: 920-27.
8. Mateus A, Brodbelt DC, Barber N, Stärk KD. Antimicrobial usage in dogs and cats in first opinion veterinary practices in the UK.. *J Small Anim Prac* 2011; 52: 515-21.

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