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A Survey of Diagnosis and Treatment of Pet Canine Parvovirus Disease in China

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Abstract: The aim of the survey was to investigate epidemiology, diagnosis and therapy situations of pet Canine Parvovirus (CPV) disease in China and to provide data for further anti-CPV drug development. Questionnaire survey was carried out in 30 veterinary clinics in Beijing, Xi'an, Zhengzhou, Tianjin and Hanzhong in December, 2009. The proportions of CPV dogs in all clinic treated dogs were 15.64, 19.37 and 20.51% in 2007, 2008 and 2009, respectively with an increasing tendency. About 32.00% CPV positive dogs were vaccinated. Most of the unvaccinated dogs were puppies. Imported vaccine produces were used in 93.33% clinics and homegrown vaccines in 33.33% clinics (some clinics used both vaccines included). The CPV antigen test kits made in Korea were used in 96.67% clinics. As for the treatment, the average duration was 5.5 days and 90.00% clinics used CPV Monoclonal Antibody (McAb) while 42.70% of the total payment was expended in CPV McAb. The CPV McAbs were usually combined used with other drugs in treatment. Therefore, it was hard to evaluate the McAb drug effect. The McAb products are the main sources for CPV diagnosis and treatment. Information of CPV treatment is inadequate in China therefore, more surveys, technologies and produces should be developed in CPV diagnosis and therapy.

Key words: Canine Parvovirus (CPV), questionnaire survey, pet dog, Monoclonal Antibody (McAb), cost, China

INTRODUCTION

The Canine Parvovirus (CPV) disease is a kind of highly contagious and infectious disease caused by Canine Parvovirus type-2 (CPV-2) (Shackelton *et al*., 2005). Canine parvovirus disease characterized by depression, vomiting and hemorrhagic (Decaro *et al*., 2007). The CPV-2 disease was first reported in China in 1982 (Wang *et al*., 2005). Along with the increasing number of pet dogs in China in recent years, CPV disease has emerged as a veterinary public health concern that affects puppy mainly for its high mobility and motility (Zhang *et al*., 2010). At the same time, the diagnosis and treatment of CPV disease have explored a burgeoning of veterinary medical market rapidly. However, there is a lack of the first-hand data of CPV treatment in China for which comprehensive understanding and data supporting to the situation of CPV's epidemiology, diagnosis, treatment costs and the market scale are required. This investigation analyzed these issues based on questionnaire survey.

MATERIALS AND METHODS

Survey respondents: The 30 pet clinics were investigated among them there were 14 in Beijing, 9 in Xi'an, 5 in Zhengzhou, 1 in Tianjin and 1 in Hanzhong.

Methods: This survey started by delivering questionnaires to the clinics in December, 2009. The contents of the questionnaires mainly included the number of treated dogs and CPV dogs among them of each clinic during 2007-2009, CPV diagnosis, treatment and vaccination methods, costs of medication as well as the feedback from the clinician. Data were collected and analyzed after the questionnaires being taken back.

RESULTS

The proportion of dogs infected with CPV in all treated dogs: The number of treated dogs and CPV-infected dogs of each clinic during 2007-2009 was collected and

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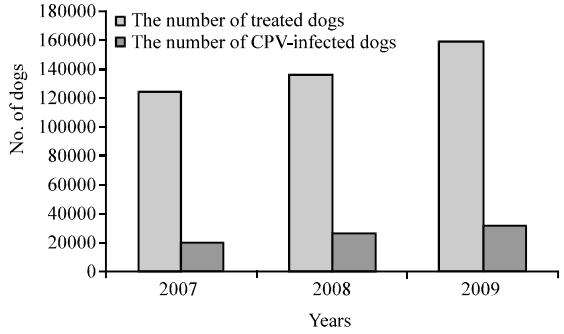

Fig. 1: The proportion of CPV-infected dogs in all treated dogs

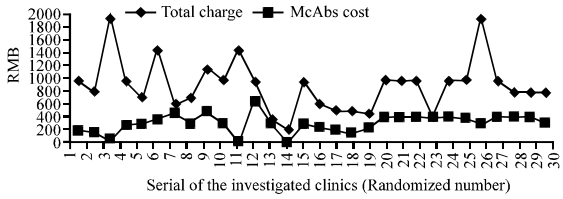

Fig. 2: The proportion of McAbs drug cost in total charge

analyzed. The proportion of CPV-infected dogs in treated dogs was 15.64% (19261 cases from 123150 in all 30 clinics), 19.37% (26193 from 135200) and 20.51% (32265 from 157300) in 2007, 2008 and 2009, respectively with an increasing tendency (Fig. 1).

The proportion of vaccinated dogs in treated CPV-infected dogs: According to the survey, 32.00% CPV-infected dogs were previously vaccinated however, most of the sick puppies had not been vaccinated. Imported vaccines were used in 93.33% (28/30) of the clinics. Of these vaccines, the intervert pentavaccines (Holland) were used most in 90.00% (27/30) of the clinics; the Merial Hexavaccines (France) were used in 26.67% (8/30) of the clinics; the Pfizer (USA) and Fort dodge (USA) vaccines were used in 16.67% (5/30) of the clinics. The 6.67% (2/30) clinics used homegrown vaccines only while 26.66% (8/30) clinics used both imported and homegrown vaccine produces.

The diagnosis of CPV disease: According to the survey, the symptom diagnosis was usually the first step then CPV antigen test kits of which used in 96.67% (29/30) clinics were made in Korea was used specifically to suspected dogs. The average diagnosis fee was 37 RMB (1 RMB ≈ 0.115 Euro or 0.147 Dollar) that accounts for about 4.10% of the total cost. It was found that there were mainly three problems in the CPV antigen test kit according to the clinician's complains: first, false positive results were high; second, it was hard to find the sick dogs during the incubation period for the low density of virus; third, there were still some mutated CPV virus which cannot be tested by current produces.

The therapy of CPV disease: According to the investigation, the treatment lasted for 5.5 days in average and the payment was around 913 RMB. So far, 82.00% of the treatment was effective and no specifically effective drug against CPV disease had been developed. The McAb were used as the supportive treatment by 90.00% (27/30) clinics. The average proportion of McAb cost in total fee was 42.70% (Fig. 2). All the anti-CPV McAbs used in these 27 clinics were made in China. The McAb was combined used with other specific, supportive and symptomatic therapy and medicines in all 27 clinics. A few pet owners gave up the treatment because of the high cost (small proportion, no data available based on clinicians' memory). Through the investigation, there were many kinds of anti-CPV McAbs drug produces available in Chinese markets. However, most of them were sold without approval by veterinary drug administration authority (Ministry of Agriculture) according to the survey as well as a survey in 2006 (EB/OL). Interferon and non specific immunoglobulin were also used in the treatment for enhancing the immune ability of sick dogs (Elia *et al*., 2005). Some anti-vomiting drugs and styptic drugs were also used as supportive treatment.

Clinician's attitudes: According to the investigation, only 30.00% (9/30) clinics expected a lower price of the products while all the clinics (30/30) thought that the treatment effect of the new drug (s) should be improved. Therefore, the clinicians had more expectations on high-quality drugs. It showed that most of the CPV antigen test kits and anti-CPV vaccines used in these clinics were imported indicating a larger market quotient possessed by imported drugs rather than homegrown drugs.

DISCUSSION

It is reported that >10 million dogs were bred in China in 2004. By 2007, this number reached 21 million. With the increase of dogs' number, the CPV infection had also increased, this demonstrated that the preventative strategies and clinical treatment of CPV disease could become the key point of research.

According to the investigation, all of the CPV antigen test kits and most anti-CPV vaccines (93.33%) in the pet markets were imported indicating a large space for Chinese researchers and manufacturers to improve their products. The investigation also revealed some problems in imported products such as false positive results and immune failure.

Drug combination is one of the characteristics of anti-CPV treatment and it meets the need of treatment (Kalli *et al*., 2010). However, problems such as drugs' abuse, increased costs and unwariness of single drug's effect may occur.

CONCLUSION

This survey demonstrated that the cure rate of CPV disease was not that high, especially for the puppies. As mentioned before, most anti-CPV McAbs used in Chinese veterinary markets were illegal without drug approval by Chinese Ministry of Agriculture. The reasons for the manufacturers' avoiding applying for a drug license could be the high costs, the long time and the complicated new drug application procedures. Furthermore, it was difficult to evaluate the effect of anti-CPV McAbs due to its combination with other drugs in treatment. It is demanded that drugs' ingress into the markets and the usage of drugs should be controlled from the point of view to regulate veterinary drug markets and to protect animal hosts' profit. It has revealed that all the clinics participated in the investigation focus more on the curative effect and the quality of the products. This reflected that the animal hosts had strong consuming ability and intense expectation to the curative effect. The leading competition in these markets would lie in the curative effect and the quality of the medicine, rather than low price.

In addition because of the different consuming abilities and treatment habits in different regions and also because of the limited sample size in the present study, further investigations should be conducted in order to get comprehensive information on the situation of CPV disease and its treatment in China.

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