



Prevalence of Parvovirus Infection in Household Dogs with Special Reference to its Effects on Some Blood Parameters

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Abstract

Canine parvovirus (CPV) is one of the most important viral diseases causes enteritis in puppies. Neglected cases usually dead due to severe dehydration and anemia as sequels to enteritis and bloody diarrhea associated with leukopenia which plays an important role in lowering of the animal immunity and defense mechanisms. In the current study detection of this infection was depended on clinical examination and confirmed by using fast sero-diagnostic kit. Twenty-eight animals out of one-hundred were suspected and showed the main clinical signs of enteritis including vomiting and diarrhea. Results revealed that 20 animals were positive for the CPV infection. Animals of four months old were more susceptible, especially German shepherd dogs. Significantly decrease of the total RBCs count, HCT, Hemoglobin, leukocytes and lymphocytes levels were reported in the clinically infected animals

Key words:

Dog, Parvo virus, Sero-diagnosis

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1. INTRODUCTION

Canine parvovirus (CPV) is one of the most common highly contagious viral diseases in dogs. The clinical picture of this disease usually occurs in two forms; intestinal and cardiac forms. The enteric form is the most common and characterized clinically by vomiting, diarrhea, paleness of the visible mucous membranes, anorexia and weight loss. Cardiac form is less common; it usually affects the cardiac muscles of very young puppies and ended with death (Cunningham, 1993 and Streck et al., 2009). The infected dogs usually have a heavy concentration of the virus in their feces which cause contamination of the breeding kennels and dog shelters (Appel et al., 1978, 1979 and Chollom, et al., 2013). Transmission of this infection may be occurring through direct or indirect contact between infected and susceptible dogs. Improper vaccination protocol and vaccination failure can also lead to a CPV infection. Some dog breeds, such as Rottweiler, Doberman Pinschers, Pit

Bulls, Labrador, Retrievers, German shepherd, English Springer Spaniels, and Alaskan sled dogs, are most susceptible to this infection (Cote, 2011). This study aimed to record the prevalence of CPV infection in one hundred housed dogs admitted to Jockey veterinary clinic, which is licensed veterinary clinic in EL-Minia governorate during period from January 2015 till May 2016.

2. MATERIALS AND METHODS

2.1 Animals

One hundred of household dogs of different breeds, ages and sexes were admitted to the clinic. All of those animals were examined for the detection of CPV infection, in addition to five German shepherd dogs were considered as a control group.

2.2 Sampling:

Fecal and blood samples were collected from each dog suffer from diarrhea or apparently healthy dogs (Coles, 1986).

2.3 Clinical examination

All animals were examined clinically according to Ettinger, (2010) and Cote, (2011).

2.4 Hematological analysis:

The following parameters were measured; total red blood cells count (T. RBCs), hemoglobin concentration (HGB), hematocrit (HCT) and total white blood cells count (T.WBCs) according to Charles (2002).

2.5 Differential leucocytic count (DLC):

Blood smears were prepared immediately after taking the whole blood samples, allow these smears to dry then fixed and stained with Giemsa stain 8%, washed and dry by air then examined by using Olympus microscope and Oil immersion lens at x1000 magnification (Coles, 1986).

2.6 Sero-diagnosis

Fast direct Sero-diagnosis was carried out immediately on fecal samples by using of FASTest® PARVO Card Test Kit for detection of parvovirus specific antigens CPV-1, CPV-2, CPV-2a, CPV-2b and CPV-2c. FASTest® PARVO Card contains two different monoclonal antibodies. The mobile monoclonal antibodies bound to colloidal gold particles are located in the conjugate pad; the second is immobile located on the test line. If the feces sample contains parvovirus antigens, these will be caught by the mobile antibodies forming antigen-antibody-complexes. Migrating laterally across the membrane these complexes will form a pink-purple test line in the Test zone. Unbound complexes migrate further on to the Control zone where they are bound by the immobile monoclonal antibodies forming a pink-purple control line according to the manufacture instructions.

2.7 Statistical analysis:

Statistical analysis was conducted using SPSS 16.0 for windows (SPSS, Chicago, USA) and was carried out using one way analysis of variance. Data were expressed as mean \pm SD.

3. RESULTS AND DISCUSSION:

Canine Parve virus infection (CPV) is one of the most common destructive diseases in dogs, especially

unvaccinated animals as well as animals blow six months old. It is responsible for serious morbidity and mortality (Decaro et al., 2006a, b). The obtained result revealed that twenty animals of different ages and breeds were confirmed positive by using FASTest® PARVO Card Test Kit (Vetlab Supplies Limited Unit-Hill Park Broomers Hill Lane Pulborough). Negative samples may be due to the early stage of infection and the titers of specific antibodies still below the detectable levels or occurrence of other pathogens such as internal parasites as well as dietary problems. All examined animals shown the characteristic clinical signs of Parvo virus infection include lethargy, anorexia, persistent vomiting and foul-smelling diarrhea varying in color from bloody to yellow with traces of blood (Table 1, Figure 1). The vomiting and bloody diarrhea is closely related to the erosive and inflammatory processes of the stomach and intestinal mucosa (Loukas, et al, 2005, Mccaw & Hoskins, 2006 and Streck et al., 2009). These findings were in agreement with previous studies, which reported that vomiting and diarrhea are the first to be observed, causing the animals to become lethargic and depressed, as well as anorexia as the disease progresses (Cunningham, 1993). These signs could be correlated early by early detection; diagnosis and treatment of the infected dog avoid the dehydration and improve the animal's state. Infection and spread of this virus can be occurring by direct and indirect contact between susceptible and diseased animals, especially in animal shelters as well as contaminated feed stuff and water. This may be contributed to the virus is shed at high titers in feces of infected dogs and the excretion period may last longer, allowing a higher opportunity for contact between the virus and the new hosts even after recovered. Animals at this time usually considered as asymptomatic reservoirs; neglected vaccination was one of the main risk factors in this case (Clegg, et al., 2015). Animal's age plays an important role in the incidence of the infection; animals of four months old were more susceptible for this infection if compared with other ages (Tables 2). Animals breed also has a direct effect on the animal's susceptibility for this infection. German shepherd dogs were more susceptible, followed by Rottweiler, Griffon, Pit Bulls and Bullmastiffs breeds, respectively (Table 3). The observed results revealed that foreign breeds are more susceptible for this infection and this finding was in agreement with Nelson and Couto, 1998. The high incidence in German shepherd dogs may be because it's one of the most preferred breed in

Egypt. The obtained result revealed significant alteration of the blood picture in positive animals, including significantly decrease of the RBCs, Hg, HCT, WBCs and lymphocytes. This comes into agreement with some previous studies which reported significant correlation between the degree of leukopenia and prognosis (Woods, et al., 1980 and O’Sullivan, et al., 1984) (Tables 3& 4, Figure 2).

Table 1: Examined animals and positive cases

| Examined Animals | Clinically suspected | % | Sero-positive | % |
|------------------|----------------------|----|---------------|----|
| 100 | 28 | 28 | 20 | 20 |

Table 2: Positive cases according to their ages

| Age | positive | % |
|------------|----------|-----|
| ↓ 2 months | 2 | 10 |
| 2 months | 4 | 20 |
| 4 months | 10 | 50 |
| 6 months | 4 | 20 |
| Total | 20 | 100 |

Table 3: Positive cases according to their breeds

| Breeds | positive | % |
|-----------------|----------|-----|
| German Shepherd | 12 | 60 |
| Rottweiler | 3 | 15 |
| Griffon | 3 | 15 |
| Pit Bulls | 1 | 5 |
| Bullmastiffs | 1 | 5 |
| Total | 20 | 100 |

Table 4: Hematological Findings

| Animals' Groups | Negative group | Positive group | Control group |
|---|----------------|----------------|---------------|
| RBC X10 ⁶ /mm ³ | 5.742±0.918 | 3.098±0.732** | 5.767±1.100 |
| HGB g/dl | 9.492±0.750 | 6.00±1.00** | 13.199 ±1.269 |
| HCT % | 38.889±1.764 | 20.889±4.137** | 47.889±7.097 |
| WBCs X 10 ³ /mm ³ | 6.942±1.424 | 5.182±1.318** | 7.994±1.936 |
| Lymphocytes % | 8.822±1.225 | 5.888±0.882** | 9.659±1.589 |



Figure 1 (A) Young dog infected with Parvo Virus, (B) Bloody diarrhea from this infected dog, (C) Column with the fecal samples during its preparation for the Fast test and (D) Positive result of the fast test, Pink line was developed above the line of the control

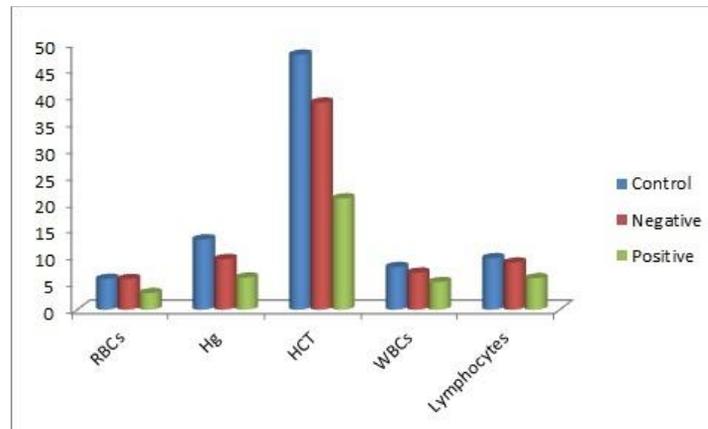


Figure 2 Chart showing the variation in blood parameters in between positive, negative and control groups.

4. CONCLUSION

Canine parvovirus (CPV) is one of the most important diseases affecting dogs, especially young unvaccinated animals cause enteritis, dehydration and significance decrease of the total RBCs count, HCT, Hemoglobin levels with a significance decrease in leukocytes and lymphocytes which are the main causes of death in infected animals, especially with neglected treatment and care. Fast sero-diagnostic kit is recommended tool for rapid detection of this infection and should be used side by side with clinical examination.

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