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Case Report

Identification of Canine parvovirus from an adult Saluki-dog in A pet's clinic in Saudi

O. Al-Tayib
Eng. Abdullah Bugshan Research Chair for Growth Factors and Bone Regeneration (GFBR), College of Dentistry, King Saud University, Riyadh, Saudi Arabia.

***Corresponding author**
Omer Altayib
Email: altayibomar@gmail.com

Abstract: A 3-years old Saluki-dog of recently-vaccinated male in Saudi experienced signs of severe hemorrhagic gastroenteritis. Due to the symptoms canine parvovirous infection was suspected as the etiologic cause of this disease. On the basis of the clinical outcomes and the presence of Canine parvovirus antigen in the stool samples from the affected dog confirmed by using a commercial in-clinic fecal antigen SensPERT® rapid test kit. Fecal sample was found to be canine parvovirous-positive whoever, the dogs was vaccinated before. A concern was raised about whether the available commercial vaccine (which contained a live, attenuated strain of parvovirous) could have caused full immunization against the infection or not. Since its emergence in the late 1970s, canine parvovirus type- 2 has spread worldwide and is recognized as an important canine fetal pathogen worldwide including developmental countries. To date this variant has been identified in many countries worldwide but there have been no reports yet of its presence in Saudi Arabia. This case report therefore represents the first published evidence of the involvement of canine parvovirus-2 in a severe outbreak of typical hemorrhagic gastroenteritis in an adult Saluki-dog from Saudi Arabia.
Keywords: Canine parvovirus; Saluki-dogs; bloody diarrhea; vaccination

INTRODUCTION

Canine parvovirus infection (CPV) is one of the most frequent causes of death in the young puppies worldwide. It is belongs to a member of the genus Parvovirus of the family *Parvoviridae* and contains negative single strand DNA about 5.2 kb in length, it was first reported in the late 1970's [1]. CPV is one of the viral diseases, showing hemorrhagic enteritis, leukopenia, nausea and myocarditis in puppies over the age of 2 months. It has been reported in several species, such as domestic dogs, coyotes, wolves and foxes. Whereas the newer genotypes can also infects cats [2]. On the other hand, the treatment usually involves extensive hospitalization, due to the severe dehydration and damage to the intestines, and treatment of infected dog consists of supportive care to correct dehydration and electrolyte abnormalities, fluid losses, control vomiting and prevent secondary infections. Thus, treatment ideally requires Intravenous (IV) fluids to achieve adequate rehydration, antiemetic such as metoclopramide, and antibiotic injections such as ampicillin®, and/or enrofloxacin® [3]. Therefore the disease is best prevented by ensuring that vaccinations are carried out appropriately, and survival rate depends on how quickly CPV is diagnosed. To our knowledge, reports on common diseases and disorder in dogs and puppies referred to veterinary medical center from Saudi Arabia, is an extremely rare. Whoever, CPV infection cases in dogs might be physiologic ileus mixed and/or miss diagnostic with another canine diseases. Salukis are still not taken in among Saudis as pets but they are recognized as a tradition of Saudi Arabia. To our knowledge, this is the first report of CPV-2 infection in a saluki-dog with vaccination failed from Saudi Arabia.

CASE REPORT

Back ground

Parvo viruses of carnivores include three closely related antonymous parvoviruses: canine parvovirus (CPV), feline panleukopenia (FPV) and mink enteritis virus (MEV).These viruses' case variety of serious disease, especially in young canine. Diarrhea is a common and multi factorial condition in dogs, the etiology of which is often incompletely understood, CPV-2 emerged as a new pathogen of dogs when outbreaks of myocarditis and hemorrhagic gastro enteritis were observed in young puppies, almost simultaneously in Europe and north of America [4]. CPV-2 is a truly new pathogen of dogs that emerged in the late 1970s. Initially seen as epidemic disease in all dogs, parvoviral enteritis is now primarily a disease of 1 – 6 months- old dogs.

CPV-2 Test Kit (Fig-1**)**

For the detection of canine parvovirus antigens from fecal specimen based on the IC test technique, we used this test which developed by VetAll Laboratories, Kyunggi-Do, Korea. SensPERT® CPV. It is one of the tests used for primary screening. It contains two molecules containing double bonds in their structure, being possible their detection the antigen of the CPV in canine feces. The test results can appear on Control (C) and Test (T) lines, where the principles of IC test are applied, and a purple band should always appear regardless of the virus antigens. SensPERT® test kit structure containing: a test, 1 ml diluents (buffer), as well as, disposable dropper, and swab for sample collection. The test kits should be stored at temperature between (2~30^{o} C).

Method Validation

Control line (C) in CPV test kit should always appear regardless of the presence of the antigen of CPV in the fecal sample. If (C) line only appears the test should consider negative (n-CPV). If this line does not appear, the test should be considered invalid and should be tested again with another kit. Test line (T) in test kit should be appearing with (C) line and the test should be considered positive (p-CPV). If (T) line was only appearing the test should be considered invalid (i-CPV) and should be tested again with another kit. In case both (T) line and (C) lines do not appear, the test should be considered invalid and should be tested again with another kit. One-step rapid test of CPV antigens results between 5~10 min, otherwise consider the test results as invalid after 10 min (Fig. 1).

p-CPV[a]	**C**	**T**	
n-CPV[b]	**C**	**T**	
i-CPV[c]	**C**	**T**	
i-CPV[d]	**C**	**T**	

Fig. 1: SensPERT CPV Test Kit (CPV Ag). (**a**) Tests consider positive if both (C-T) lines appear. (**b**) Test consider negative if only C- line appeared. (**c**) If T-line was only appearing and/or both (C-T) lines were not appeared as in **(d)** the tests considered invalid and tested again with another new kits. Within 5-10 minutes we considered the test results.

CASE HISTORY

A Saluki dog (3years-old) belong to Saudi prince from Riyadh used as a hunter dog was complaining of severe loss of appetite, fever, abdominal pain, vomiting, and bad smelling bloody diarrhea followed by severe dehydration. According to his owners, this dog had been vaccinated the first and the booster shots, using modified- live virus vaccine "Dopamine® Max 5 for Dodge. Iowa. USA". A recommended vaccination schedule for dogs start at 6 weeks of age, then revaccinated 4 weeks later almost at the age of 10 weeks. The dogs showed the typical symptoms of canine parvovirus infection with nausea, loss of appetite and hemorrhagic diarrhea. In order to find the causative etiologic agent of bloody diarrhea, fresh samples of feces had been taken and stored in universal (30 ml) labeled vials with at least 5 g of fecal matter. For the diagnostic examination a fecal sample was checked for the virus isolation, with one step SensPERT® parvovirus test kit (CPV Ag), manufactured by Vital Laboratories- Korea, for the rapid detecting of CPV antigen in the dogs feces (Figure 1). The test showing strong positive reaction within 5-8 minutes and confirmed that the fecal sample was found to be canine parvovirous-positive. In addition to that, blood sample (~5 ml) was send to the laboratory examination as a complete blood count (CBC) routine test. Blood tests were found as follows: "white blood cells (WBCs): 1.8×10^{9}/L (with 81.8% lymphocytes and 13.0% granulocytes), RBCs: 7.49×10^{12}/L, HGB: 16.2 g/dl, HCT: 46.9%, MCV: 62.7 fl, MCH: 21.6 Pg, MCHC: 34.5 g/dl".

Treatment recommendations commonly involve a combination of antiemetic to relieve more chronic symptoms of nausea, vomiting. In addition to that, more aggressive treatments including hospitalization for intravenous (IV) hydration using fluids therapy with lactated ringer's solution and ringer's with glucose. In addition, antibiotic injections were also given IV as (Betamox®) amoxicillin which was changed later to enrofloxacin® at 5 mg/kg every 12 hours had been given to reduce the secondary infections followed by the viral infections. Despite intensive treatment for consecutive 4 days, her condition continued to worsen and so later that day the dog was died. Therefore, the disease is best prevented by ensuring that vaccinations are carried out appropriately, supplemented by quickly diagnostic tools to detect the virus.

DISCUSSION

Saluki-dog is one of the most popular dog breeds in Saudi Arabia. Whoever, this type of dogs breed has adapted so well to the natural habitat of the desert. In addition to that, the Saluki has not only been bred by the Bedouin in this area as a hunter for thousands of years, but as a beautiful, elegant, intelligent and loyal companion dog.

The studies on CPV infection have been carried out intensively in a variety of canine and feline species since 1980. CPV2 infections can infects all dog breeds, age and sex. Nevertheless, the severity of the infection depends on the animal's age, stress level, breed, and immune status, particularly in puppies younger than 12 weeks, because they lack protective immunity and have an increased number of actively dividing cells [2]. Previous observations have demonstrated that CPV is highly contagious dog's virus disease, dogs can be infected as a result of contact with contaminated feces or vomits, and the infectious virus survives for at least one year in the dog environment [5]. Moreover, the mortality rate between infected dogs reaches 91%. However, according to the speed of diagnosis and aggressive treatment of the parvovirus in dog populations, the mortality rates may varies and survival rates may approach 80-95% [6]. There are only few published studies that describe infections with the newer types of CPV [7]. On the other hand, there is also discussion concerning whether the newer types of CPV-2, may cause more severe signs and infection than the original one [8]. Most of the commercial vaccines formulations contain only the original attenuated strain CPV-2. There is a discordance about the cross protection that these vaccines provides against the new variants. Only one study reports the complete protection by the original CPV type 2 based vaccines against challenge with any of the CPV circulating strains [9]. On the other hand, many of the currently used vaccines are modified live virus vaccines based on the original virus type CPV isolated at the end of the 1970's. There are, however, still many cases of clinical parvovirus occur in young animals, and vaccines should contain the newest antigenic types of a given virus, as this implies the most complete protection [10]. Furthermore, several studies have been reported that the routinely used type of vaccines for dogs is critical and recommended to protect against CPV infection [11-12]. Whoever, differentiation between the strains is not performed routinely as the treatment and clinical signs are similar. In addition, there is no specific anti-viral therapy for CPV infection.

Interestingly, this saluki-dog had been vaccinated the first and the booster shots, whoever the fecal sample test confirmed the finding of the virus and it cause the death for this patient. Whoever, this was in line with the previous study found that, there were a higher number of vaccinated yet infected animals [8-13]. Obviously many things can interfere with a successful vaccination, such as transportation and storage conditions of the vaccine vials, the moment of vaccination and the clinical condition of the animals etc., but the high incidence of demonstrated infection in these vaccinated animals only fuels the ongoing dispute an enteric infection [10].

Although, despite widespread vaccination, CPV remain the major causes of highly rates of morbidity and mortality, particularly in unvaccinated dogs, in all pet shops, and in animal shelters where several animals are affected simultaneously [13-14].

In daily veterinary practices, a confident technique; safe, economical, and rapid diagnostic tests with minimum training of the personnel, will encourage timely use of the test, based on the quick detect of the diseases and help manage outbreaks in canine populations. Therefore, there are several tests and methods to diagnose CPV infection including: virus isolation, hemagglutination, molecular methods and immunochromatography (IC) tests such as SensPERT® parvovirus rapid test kit which had been used in this case [15]. The most commonly diagnostic tool had been used recently is IC tests due to its rapid result, user-friendly format, and relatively low cost in comparison with other tests. On the other hand, other tests in spite of their sensitivity and specificity are still time consuming, labor-intensive, and need the expertise of specialists [16].

This case underlines that proactive prevention such as full vaccination, deworming and a very effective precautionary and disinfecting measures should be taken due to the high resistance of these pathogen in the dog environment is really needed. Although, still intensive research and complete knowledge is required to improve control strategies against canine parvovirus. Whoever, in spite of a large number of highly efficient vaccination protocols; this disease still represents the most prevalent virus in dogs.

CONCLUSION

To conclude, canine viral diseases need more attention. Whoever, any up normal clinical signs occur in dogs may be a sign of a serious illness, indicating at least the need for stool sample in addition to the importance of the total blood count work to investigate a possible diagnosis. Whoever, regarding the most important outcomes of the parvovirus infection in dog populations, thus SensPERT® parvovirus rapid test kit (CPV Ag) may have a place in any veterinary clinics, and veterinarians' doctors in pet clinics must follow the properly and updating diagnostic protocol against viral infections as these diseases can be deadly.

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