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Case Report

Zoonotic balantidiasis in camel from Saudi Arabia

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Abstract: A 3-year old male Arabian camel was presented for anorexia, fever, watery mucoid diarrhea. In order to find the cause of disease, blood and fecal samples were examined. The present organism was diagnosed as *Balantidium coli* trophozoites. To the author knowledge, the present case is the first report of parasitic infections with zoonotic importance in camel from Saudia. There is special need to a regular detection and deworming for Arabian camels with all respect to its zoonotic potentials in public health issues. Whoever, camels are the most principle domestic animals with highly significant population in Saudi Arabia.
Keywords: Camel; Saudi Arabia; *B. coli*; zoonotic

INTRODUCTION

In many parts of the world and especially in developing countries in Africa and Asia where most of peoples were subjected to harsh conditions; the importance of camel as an essential source of food and milk of the utmost importance. Therefore it playing extremely important role such as an economic, social and ecological roles compare to other domesticated animals in the arid and semi-arid desert environmental conditions [1].

Balantidium coli (*B.coli*) is a flattened oval organism covered with cilia and considered as one of the most important protozoan parasites belongs to the family of *Balantidiidae.* It is commonly presence in the intestinal tract of wide ranges of wild, domestic animals and human [2-3]. Since *B.coli* infections is most commonly reported worldwide in pigs, balantidiasis is very common in pigs, and it is generally accepted that pigs are the main natural reservoir hosts of this zoonotic protozoa disease for humans [4]. Whoever, several reports had been confirmed that, *B. coli* can emerge as a significant pathogen that is able to cause disease in uncommon mammalian hosts such as cattle [5], and horse [6]. Additionally, there are few reports about the presence of *B. coli* in camel fecal samples [7-8]. However, to date, both *B.coli* infections have never been reported from Saudi Arabia in large animals including camels, to the best of our knowledge, there is no previous report of camel balantidiasis in Saudi Arabia and there is a little information about the consequences and the importance of the disease in public health, whereas people in contact with camels were more likely to be infected. This study describes the occurrence of *B. coli* infection in a 3 years old camel, and is the first report of camel balantidiasis in Riyadh, Saudi Arabia which is considered as an extremely rare and unique case in veterinary fields, and supports the proposed role of camels as a reservoir host for *B.coli*. Also it will provide baseline data for further work on balantidiasis in camel.

CASE HISTORY

A 3 year-old, male Arabian camel (*Camelus dromedaries*) was complaining of loss of appetite, increasing of the temperature, watery and/or mucoid badly diarrhea fallowed by mild dehydration was admitted to our clinic. In the back ground history of this case; the camel had refused food for the last three days and it was depressed. According to the owners, there was watery, bad smelling, bloody and mucoid feces (three- five times per day) with noticeable anorexia and weight loss, developed clinical signs and diarrhea before three days later. Physical examination for these camel revealed mild abdominal tenderness and increased sounds of intestine and fever. In laboratory examination, a complete *blood* cells count (CBC test) and the other hematological parameters were determined in blood sample which was collected from jugular vein puncture (almost~5 ml of blood) for both hematological and biochemical examination work; whoever in the blood routine tests were determined in blood with (EDTA) anti-coagulant by using Electronic Counter (Model ZB1, Coulter Electronics, Hialeah, USA); and were found as follows: WBCs: 9.2×10^{9}/L, RBCs 6.14 $\times10^{12}$/L, HGB: 7.4 g/dl, and HCT: 17.6 %,

although the serum tests results as follows: Creatinine was: 8.09 mg/dl, total protein: 50.43 G/L, total bilirubin: 0.004 mg/dl, AST: 344.27 U/L, and ALT: 36.55 U/L.

In order to find the causative etiologic agent of diarrhea, Fresh sample of feces were obtained from the animal and stored in universal 30 ml labeled vials with at least 10 grams of fecal matter for the laboratory tests. Whoever, the parasitological examination revealed a plenty of enteric parasite, these organisms were identified as *Balantidium co*li (*B .coli)* trophozoites (Fig.1). Therefore, this camel was treated with short course of Terramycin® (Pfizer, USA), and metronidazole (Flagyl®) had been administered for seven days to eradicate the disease, later deworming as fenebendazole tablets and subcutaneously (SC) injecting of Ivermectin® had been used and repeated after two weeks. Finally the camel made an uneventful total recovery, with no further clinical signs to date. Following the treatment, the symptoms rapidly and completely resolved, and subsequent clinical examination revealed no further problems.

DISCUSSION

In many parts of the world and especially in developing countries where most of peoples were subjected to harsh conditions like Saudi Arabia, camels are one of the most principle domestic animals in this area, and up to date its milk and meat considered an important animal proteins source for nomads and urban daily life, and playing extremely important role such as economic, social and ecological roles compare to other domesticated animals in the arid and semi-arid desert environmental conditions [1]. Thereby, a single infection with balantidiasis in camels in Saudi Arabia considered an extremely important public health challenge for the future. The main natural reservoir hosts for *B.coli* worldwide are pigs. Whoever, balantidiasis still reported in Muslims countries including Saudi Arabia where pigs are not reared under any circumstances due to religious reasons [9-10]. Recently, several reports are mainly proposed that, camels are likely involved in the transmission of the human infections in these regions [8-11]. Additionally, a study from Saudi Arabia, confirmed that domestic animals are responsible in the epidemiology of this protozoan parasite, due to the fact that vegetables were found contaminated with the *B.coli* cyst [12]. Due to the fact that, camels are the best suited domestic animal than any other species in arid and semi-arid region conditions including Saudi Arabia, it seems that camels should considered being the most important natural reservoir hosts for human infection. However, in this area camels share habitat with humans, roaming freely, and fecal contamination of food and water occurs.

This protozoan parasite is usually associated with intestinal, and infects the caecum and colon of the patients causing gastrointestinal symptoms and the transmission is direct and commonly occurs through contaminated water and food [13]. In most cases, it lives as a commensally organism in healthy human and animals. However, in invasive cases, *B.coli* can invade the mucosa of the colon and extra-intestinal infections may occur, producing a local generalized peritonitis with perforations [4]. Furthermore, *B.coli* can spread through the peritoneal cavity via circulatory or lymphatic systems to lung [14]. However, several studies had been reported that, *B.coli* will perforate the large intestine to lungs with immunocompromised patients [15-3]. In addition to that, it can involve the patient's urinary system and the *B.coli* trophozoites were repeatedly found in the urine sediment [16]. More recently, involvement of bone by *B. coli* had been reported, and it case osteomyelitis of the spine [17].

Since *B. coli* are most commonly reported protozoan parasite in pigs, balantidiasis is very common in pigs [13]. To date, however, *B.coli* has never been reported in large animals including camels in Saudi Arabia. To the author's knowledge, the present case is the first report of camel balantidiasis which is considered as an extremely rare and unique case in veterinary fields, which suggests that balantidium can occur rarely in camels. Whoever, Arabian camels in this area should also be considered as a possible source of enteric zoonotic parasites, which represent a great importance in public health issue. Furthermore, veterinary clinicians should keep in mind that, the importance of fecal examinations cannot be ignored, and the attitude that "it's just a fecal" must be eradicated to manage and provided the proper care for these internal parasites infecting. Moreover, this finding indicates the necessity of using an anthelmintic drug for increasing the health and productivity of camels, although, to prevent transmission of these infections to humans/animals. Additionally, in many parts of the world and especially in developing countries where most of peoples were subjected to harsh conditions like Saudi Arabia, camels are one of the most principle domestic animals in this area, and up to date its milk and meat considered an important animal proteins source for nomads and urban daily life, and playing extremely important role such as economic, social and ecological roles compare to other domesticated animals in the arid and semi-arid desert environmental conditions [1]. Thereby, a single infection with balantidiasis in camels in Saudi considered an extremely important public health challenge for the future.

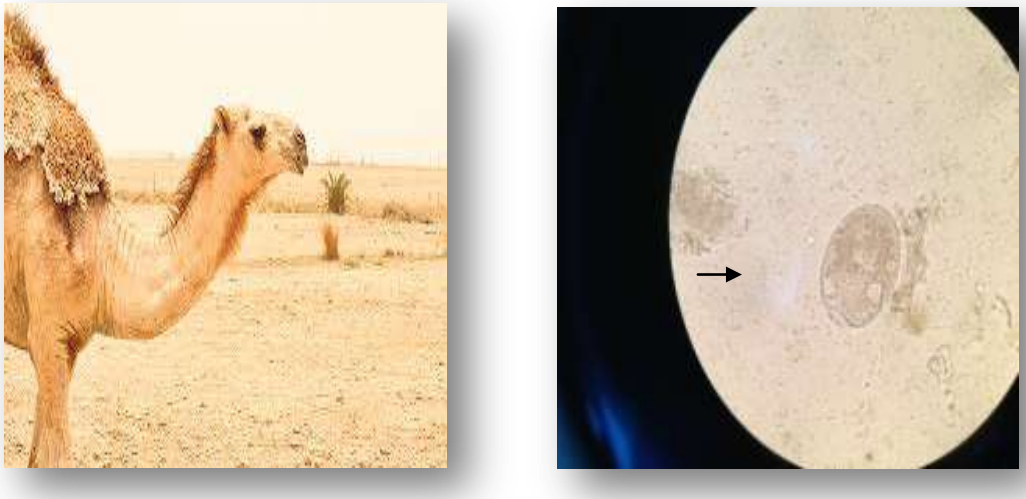

Fig. 1: Laboratory examination of male Arabian camel stool samples from Saudi Arabia. Fecal samples revealed a plenty of *Balantidium coli* (*B.coli*) trophozoites.

CONCLUSION

This case reported demonstrate that, Arabian camels must be highly considered as a possible source of intestinal zoonotic infections in Saudi Arabia, particularly, in rural areas where camels are abundant and where camel dung could contaminate soil and water. In addition, the result of this report assumes that camels are probably the most crucial missing link of such important zoonotic diseases in this area. Thus, this work may pave the way and/or provide baseline data for further studies which may focus on this public health issue.

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