

**BALANTIDIUM COLI INFECTION IN HAMADRYAS BABOON (*PAPIO HAMADRYAS*)
IN SAUDI ARABIA: A CASE REPORT**

O. Al-Tayib and K. A. Abdoun*

Eng. A.B. Research Chair for Growth Factors and Bone Regeneration, College of Dentistry, King Saud University, Riyadh, Saudi Arabia.

Department of animal Production, College of Food and Agriculture Sciences, King Saud University, Riyadh, Saudi Arabia.

*Corresponding Author E-mail: abdounn@yahoo.com

ABSTRACT

Blantidium coli (*B. coli*) is one of the most important causes of gastroenteritis in non human primates (NHPs), it mainly affects the colon of the host, and usually it is not pathogenic and due to the resistance of the host it rarely causes a serious disease. We here describe a case of *Balantidium coli* infection (Balantidiasis) in a 5 years old male hamadryas baboon (*Papio hamadryas*) in a pet shop in Saudi Arabia. The baboon had shown loss of appetite, and watery diarrhea. Two days later he started vomiting, and had shown severe bloody diarrhea. Microscopical examination for fecal sample revealed ciliated protozoa identified as *Balantidium coli*, which confirmed the diagnosis of balantidiasis.

Key words: Balantidium coli, hamadryas baboon, non-human primate, Saudi Arabia

INTRODUCTION

B. coli is a flattened oval protozoan parasite covered with cilia which belongs to the family of *Balantidiidae*. It is commonly infects human, non-human primates (NHPs), cattle's, camels, horses, rats, hamster, pigs and dogs, and has a world-wide distribution (Flynn *et al.*, 1973; Headley, 2008; Randhawa, 2010). NHPs are one of the major concerns in the public health worldwide, and play a big role in the transmission of the diseases and pathogens to human and animal populations (Wolfe *et al.*, 2005). *Balantidium coli* has been frequently reported as one of the most important causes of gastrointestinal infections in NHPs worldwide (Nakauchi, 1999). The prevalence of zoonotic intestinal parasites of hamadryas baboons (*Papio hamadryas*) including *Balantidium coli* has been reported in south and north-western Saudi Arabia (Ghandour *et al.*, 1995). In addition to that, *Papio hamadryas* has been considered as a maintenance host of *Schistosoma mansoni* in Saudi Arabia (Zahed *et al.*, 1996). *Balantidium coli* infection was recognized for the first time in two patients with dysentery (Malmsten, 1857). Pigs act as carriers to this parasite, where they have been considered as an important reservoir for the transmission of the disease. Thus, people in contact with pigs were more likely to be infected (Esteban *et al.*, 1998; Sharma and Harding, 2003). On the other hand, several studies has been reported the clinical importance of *B. coli* infection in a public health due to the fact that some of NHPs were symptomless carriers, and they could

transfer the parasite without any clinical signs of balantidiasis (Walker, 1913; Cockburn, 1948). *B. coli* is usually non pathogenic, but due to the factors which may lower the resistance of the host; it may cause a serious illness in the rest of the body (Headley, 2008). This is the first report on *B. coli* infection in a baboon kept in pet shop in Riyadh, Saudi Arabia.

Case Report: Five years old (5.4 kg) male baboon (*papio hamadryas*), was examined for intermittent diarrhea, and abdominal distension (Fig. 1). The clinical history revealed that the baboon had a severe watery diarrhea and anorexia 3 days before. Supportive therapy was initiated and Betamox® (Amoxicillin, IM Injection) was used for 2 days without improvement of the condition. Thereafter, bloody mucoid diarrhea was observed. During the physical examination, the baboon was febrile, and had signs of dehydration. Fresh samples of feces had been taken and stored in universal 30ml labeled vials with at least 3g of fecal matter. Samples were stored in 10% formalin until available for laboratory processing. Transport time to the laboratory was 30 to 45 min. Laboratory examination of the fecal samples revealed a plenty of trophozoites around 50µm long and 35µm broad, identified as *B. coli* trophozoite (Fig. 2). A short course of tetracycline and metronidazole had been given to this baboon, three times a day for 10 days to eradicate the infection. On the following day, the clinical symptoms disappeared and a fresh fecal sample taken from the baboon was negative for intestinal parasites.



Figure 1: Five years old male baboon with balantidiasis (A). *Balantidium coli* infection maintained during handling and cleaning baboon colonies (B). Note baboon feces on the wall and cage, and the cage space which may allow customer to feed and hold this baboon.

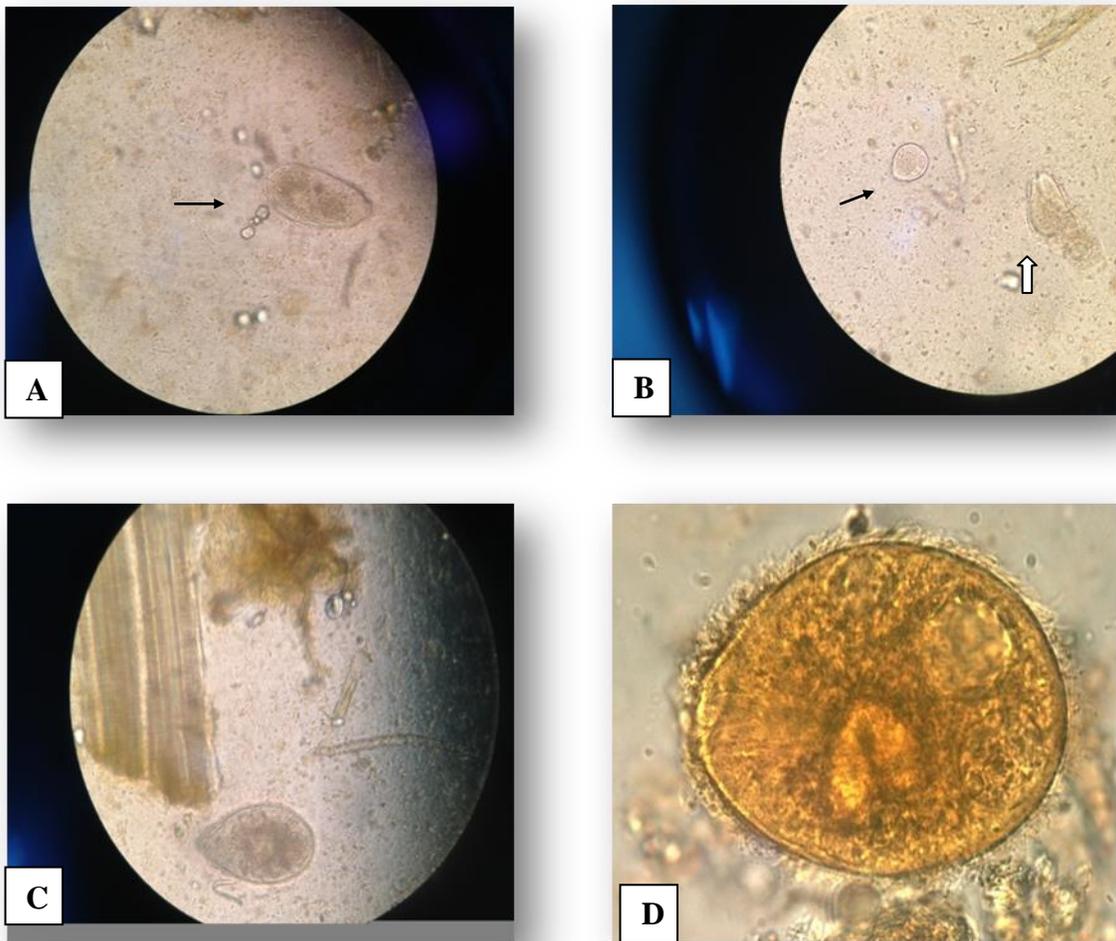


Figure 2: Laboratory examination of the baboon stool samples (A). Fecal samples revealed a plenty of *Balantidium coli* trophozoites (B, C). Higher magnification of *Balantidium coli* trophozoite showing the short cilia covering its surface (D).

DISCUSSION

B. coli infection is spread among a wide range of animal population, including baboons, rats, hamster and infrequently cats and dogs (Schuster, 2008). All these types of animals could be available under one roof in pets' shops, making the case more interesting and represents a potential risk for human infection, especially animal owners. The prevalence of zoonotic intestinal parasites of *Papio hamadryas* including *Balantidium coli* has been reported from significant baboon groups in south-western and north-western of Saudi Arabia (Ghandour *et al.*, 1995). The occurrence of *B. coli* has been reported among numerous primates including great apes, Old World and New World monkey worldwide (Nakauchi, 1999; Lévesque *et al.*, 2007; Labs *et al.*, 2010). According to Verwji *et al.* (2003) the occurrence of parasitic and protozoan infections is low among captive primates, due to routine treatment with antihelminthics and antiprotozoal compounds. However, Kilbourn (2003) reported in a comparative survey that the prevalence of parasites including *B.coli* was higher among semi captive primates compared to wild ones. The higher prevalence of *B. coli* infection in captive baboons may be the result of the captive conditions, mode of life and the available diet for baboons in captivity which is low in fiber, but rich in starch food that may enhance the parasites growth (Pomajbiková *et al.*, 2010). Although, pigs are known as the most common reservoir of *B. coli* (Esteban *et al.*, 1998), in Muslims countries such as Saudi Arabia where no pigs are reared due to religious reasons, wild boars, rats, camels, and human-to-human transmission are mainly involved in the transmission of the *B.coli* infection (Solymani, 2004; Cox, 2005). Furthermore, the extensive contamination of water and food sources, are considered as the most common mechanism of transmission of the disease (Yazar *et al.*, 2004; Schustr, 2008; Roberts, 2009). In the case reported here, the baboon had no history of deworming. Therefore, probably, the mode of transmission of this parasitic infection to the baboon might have been through contaminated diet and water (Poudyal *et al.*, 2011). In addition, the role of baboons as potential reservoirs and possible source for zoonotic transmission should not be underestimated, because of the importance of balantidiasis in public health. People in contacts with pets' animals where baboons are abundant should take precaution to avoid human infection. This case underlines that *B. coli* should be considered as a possible pathogen in baboons with watery or bloody diarrhea, which should not be allowed to have a contact with humans or other pets around prior to treatment and eradication of the infection. Certain steps should be taken to prevent blantidiasis such as education of personal hygiene, water sanitation, and treating asymptomatic carriers with antibiotics. Furthermore, regular antihelminthics and

parasitic medication for baboons in pet's shops is of great importance.

Conclusion: This report underlines that *P. hamadryas* should be considered as a possible source of *B. coli* infection in pet shops, and could play a role in the epidemiology of zoonotic protozoan infection. Thus, personal hygiene, antiparasitic protocols, routine investigations, and providing fresh foods and clean water for both humans and animals, should be taken into account as the easiest tools to prevent balantidiasis. Further studies are required to provide valuable information of pets' diseases, where much remains unknown regarding the zoonotic infections in pet's animals, particularly in primates. That might have great importance in the field of public health.

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