Case Study

Cryptosporidial Infection of Lower Respiratory Tract in a Budgerigar (Melopsittacus undulates)

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ABSTRACT
Cryptosporial and bacterial co-infection is reported in a budgerigar with clinical manifestations of septicemia and respiratory tract infection. Microscopically large number of round to oval 2-5μm cryptosporidial organisms were found to be lodged on the parabronchial epithelial cells of the respiratory tract. The bacterial colonies were seen around the parabronchial spaces of the lung tissue. It is suggested that the C. baileyi is the most likely cryptosporidium species which caused respiratory cryptosporidiosis in the budgerigar.

Keywords: budgerigar, respiratory, cryptosporidium, bacteria

INTRODUCTION

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respiratory tract (Lindsay and Blagburn, 1990; Pavlasek 1999, Ryan 2009). Out of the three identified cryptosporidium species, only *C. meleagridis* is a known threat to human beings and animals, particularly, young animals, children and immunosuppressed individuals (Akiyoshi et al 2003, Lindsay & Blagburn 1990). In the present study, respiratory cryptosporidial and bacterial co-infection is reported in a budgerigar.

**CASE HISTORY**

The diseased bird was an adult female budgerigar showing clinical signs of anorexia, severe diarrhoea (creamy-yellow), wet vent, fever, respiratory distress, which finally lead to death of the animal. The cere was asymmetric; the upper part of the right nare had a nodule and the left nare showed ulceration covered by crust. The bird's carcass was necropsied, tissue samples were taken from the lung tissue, liver, kidneys, spleen and intestinal tract were fixed in a buffered formaldehyde solution, selected tissue samples were processed in a tissue processor, paraffin blocks were made and 5 micron thick tissue sections were stained with Hematoxylin and Eosin method. No attempt was made to isolate bacteria. Selected parts of the formalin fixed segments were post-fixed in 2.5% glutaraldehyde solution and processed through standard method for transmission electron microscopy (TEM). The ultra-thin sections stained with uranyl-acetate and lead citrate were examined under a Zeiss LEO 900 transmission electron microscopy.

**DISCUSSION**

Macroscopically, the carcass was relatively cachectic, subcutaneous tissues, lungs and other visceral organs were severely congested. The intestine was edematous. The content of gizzard was cream-yellow. The cere was necrotic and empty air sacs were inflammed and thickened. Microscopically, hyperemia, congestion and degenerative changes of kidney and liver parenchyma were noticed. The lung tissues were congested and edematous. There were present of multiple colonies of the rode-shaped or cocoid bacteria located in the vinicity of the parabronchial tissues. The nature of the bacteria was not identified. A number of 2-5 microns round to oval hematoxylin stained cryptosporidia organisms were seen on the bronchial epithelium within the parasitoferrous vacuoles' (Figures 1 and 2).

![Figure 1](image1.jpg)

**Figure 1.** The lung tissue section stained with Harris H&E. the cryptosporidial organism are seen within parasitiferous vacuels (arrows). HE ×1000.

![Figure 2](image2.jpg)

**Figure 2.** Transmission electron micrograph of *cryptosporidium* schizont. The merozoites are present; Fo (Feeder organ), M (Merozoite). Scale bar= 0.5 µm.

In spite of severity of the cryptosporidial and bacterial infections, inflammatory cells at the site were scanty. The species of the cryptosporidium was not
determined. However, as mentioned by many workers, C. baileyi is a cryptosporidium species which is associated with respiratory cryptosporidiosis in various species of domestic and wild birds (Abe & Iseki 2004, Goodwin et al 1996, Graczyk et al 1996, Lindsay & Blagburn 1990, Mason & Hartley 1980, Parlasek 1993, Ryan et al 2003, Sreten & Varga 2000) therefore it is suggested that the most likely species of cryptosporidium caused infection in the budgerigar is C. baileyi. Various environmental stressors and viruses cause immunosuppresstion could cause birds to be vulnerable to protozoal infections (Abe & Iseki 2004, Lindsay & Blagburn 1990, Ryan et al 2003, Sreten & Varga, 2000). It seems birds kept under captivity in animal sanctuaries or as pet birds, may prone to acquire infectious disease, as seen in the present study. In Iran budgerigar parakeets are popular companion sold in pet shops and kept in bird's parks and zoos. The cryptosporidium infected birds could be considered as important sources of the organisms to domestic or cage birds, therefore the birds harboring cryptosporidium organisms must be detected and strict hygienic measures should be taken into consideration.

References


