

## HUMAN BERTIELLOSIS IN GOIÁS, BRAZIL: A CASE REPORT ON HUMAN INFECTION BY *Bertiella* sp. (CESTODA: ANOPLOCEPHALIDAE)

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### SUMMARY

The authors report on a new case of human Bertiellosis in a 2-year old female patient who was born in Goiânia-Goiás (Brazil) and has had history of permanent dwelling in an area frequently visited by simians in Mato Grosso (Brazil). At the time of diagnosis the patient showed inappetence, abdominal pain, and loss of weight. Eggs and proglottids were found in her stool and were identified as *Bertiella* sp. The objective of this report is to register the third case of human Bertiellosis in Brazil, characterizing one more case of helminthic zoonosis.

**KEYWORDS:** Anoplocephalidae; *Bertiella*; Human Bertiellosis; Zoonosis.

### INTRODUCTION

The Anoplocephalidae family includes heterotaxenic cestodes that use mites as intermediate hosts. In their adult phase, these cestodes are parasites of reptiles, birds, and mammals. The subfamily Anoplocephalinae comprises all Anoplocephalidae transmitted by oribatid mites, including the genus *Bertiella*<sup>2,9,16,17,19,21</sup>.

Cestodes of the genus *Bertiella* have been reported as parasites in marsupials, rodents, dermopterans, and primates in Asia, Africa, Australia, Oceania, and the Americas<sup>2,5,12,15,16,17,21</sup>. The species *B. studeri* and *B. mucronata* in the genus *Bertiella* can infect humans. Human Bertiellosis caused by *B. studeri* was first detected by BLANCHARD (1913)<sup>6</sup> in a 8-year old female patient from Mauritius Island. On the other hand, CRAM (1928)<sup>10</sup> registered the first case of *B. mucronata* infection in a young patient from Cuba. Both species are very similar and they require a specialist to discriminate between them<sup>24</sup>. Since the initial records, several cases of human Bertiellosis have been reported in the literature, with findings in Latin America, including case reports of *B. mucronata* infection in Cuba, Brazil, Argentina, and Paraguay<sup>1,9,10,11,16,18,20,21</sup> and *B. studeri* infection in the United States<sup>27</sup>. Moreover, CRAM (1928)<sup>10</sup> and CAMERON (1929)<sup>7</sup> considered human Bertiellosis endemic in the West Indies. Both authors declared their lack of knowledge about the mode and time of introduction of Bertiellosis in that region. DENEGRI & PEREZ-SERRANO (1997)<sup>16</sup> carried out a comprehensive review of all human cases of Bertiellosis reported in the literature, describing a higher prevalence of human infection caused by *B. studeri* when compared to *B. mucronata*. The authors also emphasized the increased potential of this helminthic zoonosis<sup>16</sup>.

In order to complete its life cycle, the genus *Bertiella* requires a definitive host, generally a mammal, as well as an intermediate host, an oribatid mite which is an important component of the soil fauna<sup>13,15,16,21,24</sup>. Accidental ingestion of the intermediate host infected with cysticercoids becomes the way of contamination for the vertebrate host<sup>14,15,24</sup>.

In Brazil, the first human case of parasitism by *B. mucronata* was described by PESSOA (1930)<sup>21</sup> in a 29 year-old patient from São Paulo and a second report on human infection was described by COSTA *et al.* (1967)<sup>9</sup> in a patient from Formiga (Minas Gerais)<sup>9,11</sup>. The main objective of this article is to report on a third case of human parasitism by *Bertiella* sp. (Cestoda - Anoplocephalidae) in Brazil.

### CASE REPORT

The present report refers to a 2-year old female patient born in the city of Goiânia state of Goiás but who has also lived in the State of Mato Grosso, Brazil in a rural area known to be inhabited by simians. The patient's mother reported that "maggots" were being spontaneously eliminated by the child in the intervals between evacuation. The child exhibited abdominal pain, inappetence, vomiting and weight loss. She was not hospitalized and after parasitological diagnosis follow up was not possible because the patient has not returned to the University.

### MATERIALS AND METHODS

Fecal samples were evaluated by the following methods: spontaneous sedimentation, Faust and colleagues, Baermann-Moraes and sieving. Eggs and proglottids were collected from fresh feces from the patient.

Forty eggs were measured using the micrometrical ocular technique. After sieving, proglottids were fixed by compression in cold 10% formaldehyde solution and subsequently stained with Blachin carmine.

## RESULTS

Eggs were typical, measuring approximately 40 µm (39 µm – 41 µm) of diameter, containing one rugged embryonic membrane and a bifurcated pyriform apparatus at its center (Fig. 1 and 2). Proglottids were released attached to each other, in variable numbers. The mature proglottids were much broader than long containing numerous testes, genital pores irregularly alternated and vagina surrounded by well developed cylindrical cells.



Fig. 1 - Eggs of *Bertiella* sp. showing a bifurcated pyriform apparatus (PA), 400x.



Fig. 2 - Eggs of *Bertiella* sp. showing one rugged embryonic membrane (EM) and a bifurcated pyriform apparatus (PA), 400x.

## DISCUSSION

The genus *Bertiella* (Stiless and Hassal, 1902) is characterized by medium-sized forms with well-marked segmentation, a short neck,

irregularly alternated genital pores and one set of genitalia per segment. Other characteristics include numerous testes scattered in the proglottid's parenchyma, cirrus pouch well developed, with an internal seminal vesicle. The vagina is surrounded by a layer of glandular cells and gravid uterus presented as a transverse tube filled with eggs with well-developed pyriform apparatus<sup>28,29</sup>. CHANDLER (1925)<sup>8</sup> recognized six human-infecting species while CRAM (1928)<sup>10</sup> considered three species able to infect humans and nineteen, occurring in other mammals<sup>28</sup>. BAER (1927)<sup>4</sup> classified the genus *Bertiella* into two species occurring in primates, *B. studeri* in the Eastern Hemisphere and *B. mucronata* in the Western Hemisphere. The other species, he regarded as synonymous of *B. studeri* whose range of primate hosts included *Homo sapiens*, *Simia satyrus*, *Anthropithecus troglodytes*, *Hylobates hoolock*, *Cercopithecus pygerythraeus*, *Cercopithecus schmidtii*, *Cynomolgus sinicus* and *Cynomolgus fascicularis*<sup>28,29</sup>.

The cases of human parasitism by *Bertiella* are frequently accidental and are generally associated with common dwelling areas for humans and monkeys. Despite the reduced number of reported cases, approximately 56, recent reports have demonstrated an increase in both human and non-human primate infections<sup>1,3,6,7,9,16,24,27</sup>.

*Bertiella* diagnosis is made through the presence of eggs and proglottids in patient's feces. Proglottids can also be spontaneously released and, in these cases, adequate identification requires skilled professionals and is fundamental for the diagnosis<sup>12,16,21,24,26</sup>.

Oribatid mites are the intermediate hosts and are natural components of the soil fauna. Therefore, their worldwide geographic distribution makes prophylactic attempts difficult<sup>16,21,24</sup>. POPE (1966)<sup>22</sup> and SANTA CRUZ *et al.* (1995)<sup>23</sup> emphasized the remarkable increase of *B. mucronata* infected monkeys in Argentina, reaching 420% higher rates in the last years<sup>22,23,25</sup>. Although this helminthic zoonosis is endemic in countries such as West Indies, low prevalence numbers are found in Brazil. *Cebus apella* is a common simian species in Central West Brazil but there are no reports of *Bertiella* species infecting these primates in the state of Goiás.

We report the third case of human bertiellosis in Brazil and the first in the state of Goiás. Drugs used in the treatment for cestoda, such as quinacrine, niclosamide, praziquantel and albendazole have been prescribed to treat the human bertiellosis. The helminth is not well adapted to the human species and intense weight loss is an important clinical sign of the infection<sup>21</sup>. Information about therapy regimen implemented, parasitological cure and current patient clinical status could not be obtained because, after diagnosis, the patient and her parents have not returned to our laboratory at the University.

## RESUMO

### Parasitismo humano por *Bertiella* sp. (Cestoda-Anoplocephalidae) no Estado de Goiás, Brasil

Relata-se o encontro de um novo caso de bertiellose humana em paciente do sexo feminino, 2 anos, natural de Goiânia, Estado de Goiás com histórico de permanência em área freqüentada por símios no Estado de Mato Grosso. A paciente apresentava inapetência, dores abdominais, emagrecimento e eliminava nas fezes ovos e proglotes que foram

identificados como *Bertiella* sp. O objetivo do presente trabalho é registrar o encontro do terceiro caso de parasitismo humano por *Bertiella* sp. (Cestoda-Anoplocephalidae) no Brasil, caracterizando mais um caso de zoonose helmíntica.

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