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CRYPTOSPORIDIA IN ECTOTHERMS AND HUMAN CONTACTS

By

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الكربتوسبوريديا في الحيوانات ذات الدم البارد والانسان المخالط لهم

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أجريت هذه الدراسه لمعرفة مدى أصابة حيوانات ذوات الدم البارد والعمال المخالطين لهم بطفيل الكريبتوسبوريديا . وقد تم جمع عينات البراز من الاعداد الممكنه الموجوده بحديقة الحيوان ثم فحصها بعد صبغها بصبغة الزيل نيلسون المعدله . ووجد أن (٢٠٪) مصاب بالطفيل وهو التمساح النيلى و (١١٪) من العمال المخالطين لهذه الحيوانات . وعند أجراء العدوى الصناعيه لفئران سويسريه بيضاء بالطور المعدى لهذا الطفيل المعزول من الانسان والتمساح النيلى وجد امكانية نقل هذا الطفيل بين الانسان وهذه الحيوانات .

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SAMMARY

Investigations were carried out on Cryptosporidia protozoa infecting Ectotherms and their attendants in Giza zoological gardens, Giza governorate. Faecal samples were taken from one greek tortois (*Testudo graeca*), two Nile crocodile (*Crocodylus niloticua*), one egyptian tortoise (*Testudo Kleinmanni*) and one Sudanese tortoise (*Testu soloata*). Faecal samples from nine attendants, one from each, were examined for the same purpose. Samples were stained by the modified Ziehl-Neelsen technique which revealed Cryptosporidia oocysts in one attendant (11%) and one Nile crocodile (20%). The experimental infection in mice and the measurements of oocysts of both man and Ectotherms in natural and experimentally infected mice indicated the possible transmission of infection between man and ectotherms.

Keywords: Cryptosporidia, ectotherms and human.

INTRODUCTION

Cryptosporidium is a protozoan parasite, which completes its life cycle on intestinal and respiratory surface epithelium of mammals, birds and reptiles *LEVINE, 1985)*. Cryptosporidium was first recognized in the gastric glands of the laboratory mouse by *TYZZER in (1907)*. The infection has been recorded in seven orders of mammals, four orders of birds, two orders of fish and one order of reptiles *(O'DONOGHUE* et al., *1987)*> Cryptosporidia infection is prevalent, in particular, in young ages and in the immunosupressed hosts *(RONCORONI* et al., *1989)*. The resulting disease is reviewed as" AIDS-related zoonosis" *ECKERT, 1989)*. The organisms in reptiles were found, histologically, on the microvillus border of the gastric epithelium with some pathologic changes, yet the source of infection was unknown*(BROWNSTEIN* et al., *1977)*. Therefore, the present work has been carried out to postulate the importance of Cryptosporidium, infecting Ectotherms from the zoonotic point of view.

MATERIALS AND METHODS

Faecal samples from 5 Ectotherms and their 9 attendants in Giza zoological gardens were freshly collected individually in plastic bags. Smears were prepared singly from each specimen,

air-dried then stained using the modified Ziehl-Neelsen technique *(HENRIKSEN and POHLENZ, 1981)*. The films were fixed in absolute methanol for 10 minutes, then immersed in concentrated cold fuchsin (1.0g fuchsin, 10 ml ethanol and 90 ml of 5% phenol) for 5 minutes. The slides were then rinsed with tap water for 2 minutes, decolourized with 10% sulphuric acid for 30 seconds and rinsed again in tap water for 2 minutes. Counter staining with 5% malachite green (5.0 g of malachite green, 100 ml of 10% ethanol) was done for one minute. The smears were rinsed with tap water, air-dried and examined microscopically by the oil immersion lens to detect Cryptosporidium oocysts.

Concentration of oocysts from positive cases was carried out by sheather's sugar solution(*ANDERSEN, 1981)*, to be used for experimental infection. 16 Swiss baby mice, obtained from a clean colony, maintained in Animal Health Research Institute, were orally inoculated with 0.2 ml of the oocysts suspension. After experimental infection, daily examination of faecal material was carried out by the modified Ziehl-neelsen method, to determine the first appearance of oocysts and the patent period.

RESULTS

Microscopic examination of faecal smears from crocodile showed Cryptosporidia oocysts stained dark red on a green back ground using modified Ziehl-Neelsen stain. They measured 4.95 x 4.37 microns and 4.00 x 5.00 microns during natural and experimental infections respectively. The same picture appeared on examination of attendants facal samples.

Microscopic examination of faecal samples revealed Cryptosporidia oocysts in one out of nine attendants (11%). Concerning Ectotherms, one Nile crocodile out of five proved to be infected with Cryptosporidia (20%).

Regarding experimental infection, oocysts recovered from the attendant produced active infections in four mice out of six and in five out of six mice in case of Ectotherms. In each case, two mice were left as control.

DISCUSSION

Cryptosporidiosis has been reported in Egypt in human beings as well as different species of animals *(SALEM, 1989).MIKHAIL* et al. *(1989)* recorded the infection in man in Aswan (9%), while *SALEM (1989)* found a percentage of 7.3% in human beings in Giza. The variation in the infection may be a

function of several factors such as the frequency of contact with animals *(MABROUK, 1986)* and the lack of personal immunity *(CANCRINI* et al., *1989)*.

Clear evidence about Ectotherms infection with Cryptosporidia is still lacking. *BROWNSTEIN* et al. *(1977)* reported Cryptosporidiosis in 15 snakes. In the present study, the detection of Cryptosporidia oocysts in the Nile crocodile is considered to be the first record in such species of Ectotherms in Egypt. the source of infection of these animals may be the attendants themselves who are always in contact with them in the zoo gardens. Mountain rats given to them as feed may be naturally infected with this parasite and contribute to such parasitosis in the crocodile. The infection is maintained between the crocodile and the attendants. This has been proved here by the successful cross transmission of the isolated oocysts from both man and Ectotherms to mice.

The prepatent period of the parasite in mice experimentally infected with oocysts of human origin was 3-7 days and the patent period was 2-9 days. In this respect, *SALEM (1989)* reported on a prepatent period of 4 days and a patent period up to 10 days in experimentally infected mice. On the other hand, mice infected with oocysts recovered from crocodile began to shed oocysts on the 3^{th} - 5^{th} days post-infection and continued for 10-15 days. *SALEM (1989)* recorded the first appearance of oocysts on the 5^{th} - 13^{th} day post-infection in mice infected with oocysts from animal origin, and the infection continued for 9-31 days. In either case, these patent periods can give suitable chance to the parasite to be transmitted to contacts or contaminate the environment. Accordingly, the crocodile may be considered as a maintenance host responsible for the dissemination of such zoonosis.

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