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Detection of *Encephalitozoon hellem* in Nasal Washings, Conjunctival and Vaginal Swabs of Immunocompromised Patients in Kano, Nigeria

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With 3 tables and 10 references

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ABSTRACT

Background: Microsporidia are widespread small unicellular, obligate intracellular parasites. They are found to flourish in patients with collapsing immune system, which are also caused by diseases due to cases other than HIV/AIDS. This study aimed at detecting the presence of this parasite in immunocompromised patients in Kano, Nigeria.

Methods: Nasal washings, conjunctival and vaginal swab samples were examined for *Encephalitozoon hellem* spores by the modified Giemsa staining technique.

Results: Nasal washings examination showed that *Encephalitozoon hellem* were detected in 4/202 (1.98%) of HIV/AIDS and 0/38 HIV-negative patients. The difference in infection rates was not significant (X^2, $p>0.05$). *E. hellem* was also detected in 1/32 (3.13%) of TB/HIV-negative patients but none was recorded among the 23 TB/HIV/AIDS patients. In the vaginal swabs, spores of *E. hellem* were detected in 7/71 (9.86%) of HIV/AIDS patients while none occurred among the 13 HIV-negative, 8 TB/HIV/AIDS and 10 TB/HIV-negative patients. There was a significant difference ($p<0.05$) between the HIV/AIDS and HIV-negative patients. *E. hellem* spores were not detected in any of the patient's conjunctival scrapings.

Conclusion: Although detection of *E. hellem* in immunocompromised patients has not been described previously in this area, the results of this study may be of great importance in the treatment of encephalitozoonosis especially in immunodeficient patients.

Key words: Microsporidia, AIDS, *Encephalitozoon*
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Introduction

The discovery that Microsporidia appear as a serious pathogen in clinical cases of AIDS started a new era in Microsporidia research. The AIDS epidemic has revealed their propensity for infecting human. To date four genera of Microsporidia have been identified in human infections namely, *Nosema, Encephalitozoon, Enterocytozoon* and *Pleistophora* [Cali *et al.*, 1991].

Microsporidia are detected by their highly characterized resistant spores ingested by hosts [Canning and Lom,

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1986]. Spores can be found in faeces, urine, cerebrospinal fluid, sputum, nasal washing, conjunctival scrapings and vaginal smears. *Encephalitozoon* species causes intestinal infections frequently associated with nephritis, sinusitis or bronchitis [Kotler, 1995]. This study was aimed at detecting the presence of this parasite in immunocompromised patients in Kano, Nigeria. To our knowledge there are no records describing the presence of this parasite in this area.

Materials and Methods

Patients involved in this study were in- and out-patients of the Infectious Disease Hospital, Kano, Nigeria. The total number of subjects was 321 consisting of HIV/AIDS, HIV-negative, TB/HIV/AIDS and TB/HIV-negative patients. Each patient provided fresh samples of nasal washings, conjunctival and vaginal swabs upon admission. For Microsporidial investigation, smears of these samples were prepare on different glass slides, air-dried, fixed with absolute methanol and stained with 10% Giemsa solution for 35 min, and examined at ×1000 magnification as described by Van-Gool *et al.*, [1990, 1993]. Giemsa stained spores are broadly oval with the cytoplasm staining light gray-blue with a dark stained nucleus.

Results

In the nasal washing samples, *Encephalitozoon hellem* were detected in 4 (1.98%) of the 202 HIV/AIDS patients and none from the 38 HIV-negative patients examined. There was no significant difference in their infection rates (X^2, $p>0.05$). Of the 32 TB/HIV-negative patients, 1 (3.13%) had *E. hellem* as against the none recorded among the 23 TB/HIV/AIDS patients (Table 1).

Vaginal swab examinations showed that *E. hellem* were detected in 7 (9.86%) of 71 HIV/AIDS patients, while none occurred in 13 HIV-negative, 8 and 40 TB/HIV/AIDS and TB/HIV-negative patients, respectively (Table 2) There was a significant difference ($p<0.05$) between the infection rates of the HIV/AIDS and HIV-negative patients.

E. hellem were not detected in 207 HIV/AIDS, 46 HIV-negative, 28 TB/HIV/AIDS and 40 TB ptients without HIV infection in their conjunctiva scraping samples (Table 3).

Table 1. Prevalence of *E. hellem* in nasal washings of immunocompromised patients in Kano, Nigeria

Nasal washing samples	No. examined	No. positive	(%)
HIV/AIDS patients	202	4	1.98
HIV-negative patients	38	0	0.00
TB/HIV/AIDS patients	23	0	0.00
TB/HIV-negative patients	32	1	3.13
Total	295	5	–

Table 2. Prevalence of *Encephalitozoon hellem* in vaginal swabs of immunocompromised patients in Kano, Nigeria

Nasal washing samples	No. examined	No. positive	(%)
HIV/AIDS patients	71	7	9.86
HIV-negative patients	13	0	0.00
TB/HIV/AIDS patients	8	0	0.00
TB/HIV-negative patients	40	0	0.00
Total	132	7	–

Discussion

This study described an emerging extra-intestinal protozoon in Kano, Nigeria, where there is little or no study. The microsporidium from the corneal, conjunctival and nasal epithelia of an AIDS patient has previously been identified as species of *Encephalitozoon* [Metcalfe *et al.*, 1992]. In the present study, *E. hellem* were detected in

the nasal washing and vaginal swabs of the HIV/AIDS and some TB patients, but not in the HIV-negative patients which conforms with earlier reports that Microsporidia occurs in immunocompromised patients particularly in HIV/AIDS patients [Orenstein, 1991; Hollister *et al.*, 1995].

Table 3. Prevalence of *Encephalitozoon* species in conjunctival scrapings of immunocompromised patients in Kano, Nigeria

Nasal washing samples	No. examined	No. positive	(%)
HIV/AIDS patients	207	0	0.00
HIV-negative patients	46	0	0.00
TB/HIV/AIDS patients	28	0	0.00
TB/HIV-negative patients	40	0	0.00
Total	321	0	0.00

Scant data are available on extra-intestinal microsporidiosis in immunocompromised African adults [Cegielski *et al.*, 1999] and little or nothing is known about encephalitozoonosis in Nigeria. Also several serological surveys for antibodies to *Encephalitozoon* species in human has suggested widespread subclinical infections [Omalu *et al.*, 2003] which might lead to full-blown clinical diseases when an individual becomes immunocompromised either by HIV/AIDS, tuberculosis or tropical diseases such as malaria, schistosomiasis, etc.

These findings raise the question of speciation in the genus *Encephalitozoon* that might be of importance in the treatment of encephalitozoonosis especially in immunodeficient patients.

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