Medical Research Institute

Department of Parasitology

INTESTINAL MICROSPORIDIA INFECTION IN LEUKEMIC CHILDREN: MICROSCOPIC AND MOLECULAR DETECTION

A Thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy

In

Applied and Molecular Parasitology

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2019

ENGLISH ABSTRACT

Microsporidia are obligate intracellular opportunistic parasites, infections have been described to occur in rigorously immunocompromised individuals, mainly human immunodeficiency virus (HIV) patients, organ transplantation recipients or oncology patients. Limitations to correct microscopic diagnosis of microsporidia include size of the organism presenting a challenge even to a highly trained laboratory technician. The present study aimed to evaluate the performance of modified trichrome stain (MTS) and conventional polymerase chain reaction (PCR) in diagnosis of microsporidia among leukemic children with further speciation. One hundred leukemic children on chemotherapy were recruited from El-Shatby hospital, Alexandria University. Microsporidia were detected in 23/100 of the children examined by MTS and in 29/100 by PCR utilizing pan-specific primer. The 29 positive samples were then subjected to PCR for speciation using species specific primers. *Enterocytozoon bieneusi* (*E. bieneusi*) was found to predominate in 20 cases, *Encephalitozoon intestinalis* (*E. intestinalis)* in three cases and two cases had co-infection, the remaining four samples were not amplified with either *E. bieneusi* or *E. intestinalis* specific primers. By deoxyribonucleic acid (DNA) sequencing of unspeciated samples, three samples shared high homology with *Encephalitozoon hellem* (*E. hellem*) in GenBank and one sample with *Encephalitozoon cuniculi* (*E. cuniculi*). MTS and PCR showed good agreement in diagnosing microsporidiosis. Relative to PCR, MTS exhibited 72.4% and 97.2% sensitivity and specificity respectively with 90% accuracy. As for the association between microsporidiosis and different demographic and environmental variables, no significant difference between any of the studied variables and microsporidia infection as diagnosed by both techniques was found. Colic and fever were significantly associated with microsporidiosis as diagnosed by either techniques. The prevalence of microsporidia infections in leukemic children undergoing chemotherapy at a level of 29%, points to the fact that these pathogens should be considered when other etiological agents cannot be found. Staining could be suggested as a preliminary routine test for those children with the advantage of being of low-cost and simpler technique than PCR. The use of sensitive and discriminative molecular tool will contribute to determining the true prevalence of microsporidiosis.