

A survey of the diversity of human enteric protoctistan parasites and the associated risk factors in urban Zvishavane, Zimbabwe

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ABSTRACT

Community based survey of the diversity of human enteric protoctistan parasites was done on a random sample of 300 individuals in urban Zvishavane, Zimbabwe from December 2007 to May 2008. Stool, fruit, vegetable, water and pest sample specimens were analysed using the following techniques; permanent stains, microscopic analysis and the formol-ether concentration method. Stool specimen analysis showed that 98 individuals (32.67%) of the population were infected with enteric protoctistan parasites. Infestation by *Enterocytozoon bieneusi* (30.1%), *Cryptosporidium parvum* (18.4%), *Entamoeba histolytica* (16.5%), *Encephalitozoon intestinalis* (14.6%), *Cyclospora cayetanensis* (12.6%) and *Giardia lamblia* (7.8%) were noted amongst the residents. The 20-35 age group accounted for half (47.96%) of the infections. Infection frequencies were higher in the high density areas (HDAs) than in the low density areas (LDAs). There were significant differences in infection levels between residents in southern and northern HDAs ($t_c = 3.226$, $p < 0.01$). However there were no significant differences in infection loads between southern and northern LDAs ($t_c = 1.912$, $p > 0.05$). Risk factors included age, host density, pregnancy, infection by HIV or recent surgery. Improving the socio-economic conditions and raising awareness on issues related to intestinal parasitosis would aid in decreasing the infection levels in urban Zvishavane.

Keywords: parasites, enteric, protoctistan, diversity, infections, prevalence, risk factors, gastro-intestinal tract.

INTRODUCTION

Intestinal parasitic infections are a major health problem in many developing countries. Factors contributing to this problem include geographic and socio-economic ones as well as unpredictable factors such as natural disasters. The optimum environmental conditions (such as temperature in water bodies) for the viability of the parasite infective forms are compounded by poverty, malnutrition, high population densities, lack of awareness on issues related to enteric parasite infections, low health status of individuals and the unavailability of potable water (WHO, 1998).

Ravdin (1988) as cited by Smyth (1996) stated that in developing countries, amoebiasis accounts for 450 million cases of enteric parasitosis per annum and about 100 000 deaths. Insufficient research, lack of attention to issues pertaining to parasitic diseases and lack of follow up treatment are barriers to decreasing rates of parasite infection in most developing countries (Sayyari *et al.*, 2005).

Much research has been done on the prevalence and diversity of enteric parasites in various countries (Stark *et al.*, 2007, Oritz, 1980, Sayarri *et al.*, 2005)

but little has been done to determine the risk factors associated with parasite infections in the areas being investigated. In light of the problems the enteric protoctistan parasites pose to man, it is crucial to also investigate factors that shape the probability of acquiring parasite infection and the risk of developing pathology caused by the parasites. An integrated approach is vital for the efficient eradication of enteric parasitosis. Therefore, this study investigates the diversity of enteric parasites while at the same time determining the factors responsible for this diversity.

Study area: The study was carried out between December 2007 and May 2008, in Zvishavane town, Zimbabwe. It is at an altitude of 950m (en.wikipedia.org/wiki/Zvishavane, Zimbabwe) and receives an average rainfall of below 500 mm per annum, most of it received during the rainy season (October-February). The rainy season is interspaced by dry spells and temperature ranges between 8°C-32°C with 30% relative humidity (Thurston, 1999).

There are ten residential areas in Zvishavane town. The residential areas are divided into northern and southern residential areas. In the north are the following low density residential areas; Mimosa park,