Seasonal prevalence and incidence of Cryptosporidium spp. and Giardia duodenalis and associated diarrhoea in children attending pre-schools in Kafue, Zambia

Prevalence, incidence and seasonal variation of Cryptosporidium and Giardia duodenalis were studied over a 12-month period in 100 children from four pre-schools in Kafue, Zambia. Questionnaire data and a single stool sample were collected monthly from each child. Samples were processed using a commercial kit (Meridian Diagnostics Inc., USA) and oocysts visualised by immunofluorescence microscopy. Cryptosporidium was detected in 30.7% (241/786; 95% CI = 27.5-33.9) while G. duodenalis was detected in 29.0% (228/786; 95% CI = 25.8-32.2). A total of 86% experienced one or more episodes of cryptosporidiosis while 75% had giardiasis. Cumulative incidence per 100 children was 75.4 for Cryptosporidium and 49.0 for G. duodenalis. Both infections were significantly more common in the wet compared to the dry season (34.8%, 162/466 vs. 24.7%, 79/320, P = 0.003 and 35.2%, 164/466 vs. 20.0%, 64/320, P <0.001, respectively). Thus, risk ratios (RR) were 1.41 (95% CI = 1.13-1.77) and 1.76 (95% CI = 1.38-2.27) for Cryptosporidium and Giardia, respectively. Diarrhoea was significantly associated with cryptosporidiosis (RR = 1.23, 95% CI = 1.03-1.47; P = 0.029) but not with giardiasis (RR = 1.12, 95% CI = 0.91-1.53; P = 0.26). We conclude that gastro-intestinal protozoal infections are highly prevalent among children attending pre-school in peri-urban Zambia highlighting the need for further studies of risk factors.