Giardia lamblia: Isolation, Axenization and Characterization of a Strain from an Asymptomatic Patient from Belo Horizonte, MG, Brazil


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The biological importance of these differences remains unknown, but it could alter the host-parasite relationship and might also modify the immune response or resistance of the host (TE Nash 1989 Exp Parasit 68: 238-241, TE Nash & DB Keister 1985 J Infect Dis 152: 1166-1171).

Here we report the isolation, axenization and characterization of a G. lamblia strain from Belo Horizonte, MG, Brazil. Growth curves, polyacrylamide gel electrophoresis of protein extract and isoenzymes profiles were performed and compared with the axenic Portland strain (ATCC30888).

Cysts of G. lamblia were obtained from the feces of a 4-year old asymptomatic child, living in Belo Horizonte. The cysts were isolated and concentrated by centrifugation on a sucrose gradient, according to I.C. Roberts-Thomson (1976 Gastroenterol 71: 57-61). Approximately 1 x 10^8 cysts were treated with floxacin (20 mg/ml) and nistatine (1.000 U/ml) dissolved in 5.0 ml of a 2% HCl solution for seven days, at 4°C. The cysts were subsequently washed five times by resuspending them in distilled water after centrifugation at 1.000g for 5 min. Washed cysts were inoculated into 15 ml of TYI-S-33 culture medium suplemented with bovine bile (0.06%) and 250mg/ml streptomycin and 200 U/ml penicillin G, and incubated at 37°C. Cultures, examined three days later, had abundant trophozoites. Subculturing in the same medium was done. After the third passage, antibiotics were not included in culture media. Culture samples, inoculated into thiglycolate and agar-blood were passages five times to confirm axenicity. The isolate was then considered to be axenic and designated BHRF92. The growth curve of BHRF92 strain was similar to that obtained for the Portland strain. Protein extracts from both strains were submitted to polyacrylamide gel electrophoresis and presented qualitatively and quantitatively distinct profiles (Fig. 1). Comparison of the electrophoretic profiles of trophozoites suggest that there is a considerable antigen heterogeneity between the BHRF92 strain and the Portland. The isoen-zymatic characterization was performed using malate dehydrogenase (MDH) (EC1.1.1.37), 6-phosphogluconate dehydrogenase (6PGDH) (EC1.1.1.44), glucose-6-phosphate dehydroge-nase (G6PDH) (EC1.1.1.49), glucose phosphate isomerase (GPI) (EC5.3.1.9.), phosphoglucomu-tase (PGM) (EC2.7.5.1.), alanine aminotransferase (ALT) (EC2.6.1.2.) and aspartate aminotransferase (AST) (EC2.6.1.1.).
The isoenzyme analysis revealed differences in six enzyme patterns (GPI, MDH, PGM, 6PGDH, ASAT and ALAT) and homogeneity in one enzyme (G6PDH). The GPI and 6PGDH presented more remarkable differences. (Fig. 2). The two strains showed distinct zymodemes as has been demonstrated for others G. lamblia strains from various geographical location (MA Betram et al. 1983 J Parasit 69: 793-801, Meloni loc. cit.).

This is the first report on the isolation, axenization and characterization of G. lamblia from Minas Gerais. The differences in G. lamblia strains can be correlated with variable clinical manifestations, host responses and treatment efficacy of human giardiasis (Korman loc. cit.). Also, the differences could be important for clinical diagnostic and therapeutic. These preliminary data present information on a strain of G. lamblia that could be taken as a reference for further comparisons.