XVII INTERNATIONAL SYMPOSIUM ON
SCHISTOSOMIASIS
PERSPECTIVES ON SCHISTOSOMIASIS ELIMINATION
NOVEMBER 10-13TH 2024 | SALVADOR - BAHIA

Indicate the format in which you wish to present your work: ☒ Poster ☐ Oral Presentation

TITLE

PHARMACOGENETICS AND PRAZIQUANTEL: CYP2C19 PHENOTYPES FREQUENCIES IN ALAGOAS STATE, BRAZIL

AUTHORS

Andrade, M.R.[1]; Correia, G.M.A.[1]; Santos, T.R.[1]; Santos, M.L.[1]; Freitas, H.A.[1]; Paz, M.N.V.T.[1]; Costa, A.R.R.S.[1]; Nogueira, K.R.C.[1]; Lindenau, J.D.[2]; Muniz, Y.C.N.[2]; Hausmann, L.D.[2]; Botton; M.R.[3]; Marques, C.S.[1]; Sortica, V.A.*[1]

AFFILIATIONS

[1] Universidade Federal de Alagoas
[2] Universidade Federal de Santa Catarina
[3] Universidade Federal do Rio Grande do Sul

ABSTRACT

Human schistosomiasis is a chronic parasitic disease resulting from infection by trematode worms of the Schistosoma genus. It mainly affects impoverished populations who are unaware of its potential for transmission from water sources. In Brazil, an estimated 2.1 million people live in schistosomiasis-endemic areas. The treatment used for symptomatic cases and schistosomiasis prophylaxis is based exclusively on Praziquantel. Studies have shown significant variability in the cure rate and effectiveness of treatment for schistosomiasis in different countries. Recent studies in populations from schistosomiasis-endemic African countries have shown that part of this variability is due to genetic variants in the cytochrome P450 isoforms. Pharmacokinetics studies with children of southern Ethiopia, Rwanda, and Tanzania who received Praziquantel preventive chemotherapy showed that carriers of CYP2C19 defective variant alleles *2 and *3 had significantly higher mean Praziquantel plasma concentration than CYP2C19 *1/*1 homozygotes or *17 carriers, which could lead to a higher risk to toxicity. The impact of genetic variants on the population treated in schistosomiasis-endemic regions in Brazil is unknown. The study aims to estimate the frequencies of the CYP2C19 phenotypes in a population of the Alagoas state, Brazil. A total of 423 healthy subjects were genotyped for the CYP2C19 *2 (rs4244285), *3 (rs4986893), and *17 (rs12248560) functional alleles with TaqMan™ assays by real-time PCR. The subjects were primarily males (63.5%), with a mean age of 39.5. In the study population, the CYP2C19 alleles *1, *2, and *17 showed frequencies of 64.2%, 17.4%, and 18.4%, respectively. The *3 allele was not present in the population. Based on the *1, *2 and *17 haplotypes, the population presented the phenotypes of 40.9% extensive metabolizer (*1/*1), 28.6% intermediate metabolizer (*1/*2 + *2/*17), 3.1% poor metabolizer (*2/*2), 24.1% rapid metabolizer (*1/*17), and 3.3% ultrarapid metabolizer (*17/*17). The results indicate that only 40% of the population should metabolize Praziquantel at the expected rates. Approximately 30% of the population may have a slower rate of metabolization of Praziquantel, which may raise its plasma concentration and increase the chance of adverse effects with treatment. Similarly, up to 27% of the population may metabolize Praziquantel more quickly than expected, thus not reaching the desired concentration, which could reduce the effectiveness of the treatment. Further studies are needed to investigate these phenotype impacts on schistosomiasis-treated patients in Brazilian endemic regions.

KEYWORDS

Schistosomiasis; Treatment; Polymorphism; Cytochrome p450

FINANCIAL SUPPORT

National Council for Scientific and Technological Development – CNPq; Department of Science and Technology of Secretariat of Science, Technology, Innovation and Health Complex of Ministry of Health of Brazil – MoH