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

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TITLE

EVALUATION OF MOLECULAR DIAGNOSTIC TESTS FOR INTESTINAL SCHISTOSOMIASIS IN A RURAL AREA IN THE STATE OF BAHIA, BRAZIL

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ABSTRACT

Among neglected tropical diseases, schistosomiasis stands out for presenting an important degree of morbidity, affecting thousands of people throughout Brazil. Currently, disease control is mainly based on parasitological diagnosis by Kato-Katz (KK) and treatment of infected individuals. However, despite being extremely specific, KK does not present the same performance in relation to its sensitivity when applied in samples of individuals from low endemic areas. This fact is relevant since nowadays the majority of the endemic areas in Brazil present low endemicity for disease. Therefore, an effective diagnosis, with wide application in the detection of active infections and in the precise monitoring of cure after treatment, represents an essential instrument for knowing the real prevalence of schistosomiasis and to guide controlling actions. In this sense, this work proposed to evaluate diagnostic tests based on real-time PCR (qPCR) and Loop-Mediated Isothermal Amplification (LAMP) in order to improve disease diagnoses, due to its ease of execution, stability of reagents and performance in clinical evaluation. All tests were conducted blindly. Stool samples collected from residents of Conde, BA, a high endemicity area in the state of Bahia, were examined by KK and Helmintex technique (HTX). After sample examination, a positivity rate of 34.3% (IC95%: 27.7-42) and 45.3% (IC95%: 37.4-54.4) was observed with KK and HTX techniques, respectively. Participants who were positive for S mansoni eggs by KK or HTX were treated and collected new stool samples 30, 180 and 360 days after treatment. Total DNA was extracted from 500 mg of feces using the commercial QIAamp Power Fecal Pro Kit (Qiagen, Germany), following the manufacturer's recommendations. Extracted DNA was analyzed and quantified in the Nanodrop and amplified by qPCR and LAMP techniques. The qPCR's results were interpreted considering a cut-off point of Ct 42, and demonstrated a positivity of 24.07% (IC95%: 18.9-29.7) at T0, before treatment. No samples were positive at T30. At T180 and T360 the positivity rates were of 2.56 and 12.12%, respectively. Regarding LAMP results, a positivity of 55.64% (IC95%: 49.4-61.6) was observed before treatment, while at T30, T180 and T360 the positivity rates were 46.65; 44.73; and 9.09%, respectively. Compared to KK, qPCR showed lower positivity, while LAMP showed higher positivity, before treatment. After treatment, LAMP continued to show high positivity, while qPCR presented drastically reduced positivity. After opening the database of study participants, it will be possible to carry out further analyzes to determine which diagnostic technique performed best in the endemic area studied.

KEYWORDS

Diagnosis; qPCR; LAMP; Schistosoma mansoni

FINANCIAL SUPPORT

FAPEMIG; PIBIT/FIOCRUZ; FIOCRUZ