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Asian Pacific Journal of Tropical Biomedicine

journal homepage: www.elsevier.com/locate/apjtbOriginal article <http://dx.doi.org/10.1016/j.apjtb.2017.01.026>

The road towards sustainable control of schistosomiasis in the Democratic Republic of Congo: Pre-assessment of staff performance and material resources in endemic regions

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ARTICLE INFO

Article history:

Received 7 Sep 2016

Received in revised form 16 Nov, 2nd

revised form 12 Dec 2016

Accepted 31 Dec 2016

Available online 24 Jan 2017

Keywords:

Schistosomiasis

Control

Performance staff and material resources

Democratic Republic of Congo

ABSTRACT

Objective: To improve knowledge and practice of health staff as well as the availability of material resources for diagnosis and management of schistosomiasis in two endemic provinces of DRC (Kinshasa and Bas-Congo).

Methods: Structured interviews were performed using questionnaires with staff from 35 healthcare facilities in 9 health zones (HZ) of Kinshasa and 2 HZ in Bas-Congo.

Results: Schistosomiasis was reported to be present in all the included HZ. Health staff knew the most important symptoms of schistosomiasis, but advanced symptoms were more accurately reported in Bas-Congo. Knowledge of symptoms related to schistosomiasis such as anemia ($P = 0.0115$) and pollakiuria ($P = 0.0260$) was statistically different in both two provinces. Kato-Katz technique and urine filtration were unavailable in both provinces. Parasitological diagnosis was mostly performed using the direct smear method. PZQ was available in 70% of the health facilities, all situated in Bas-Congo. Diagnosis and treatment mostly relied on symptoms and cost more in urban area than in rural.

Conclusions: Though knowledge on schistosomiasis among health staff appears sufficient, substantial efforts still must be made to improve the availability of diagnostic tools and treatment in the health facilities in DRC.

1. Introduction

Schistosomiasis is a poverty-related chronic helminthic disease affecting 78 countries [1]. More than 230 million individuals need treatment over the world: among them, 220 million are in the African region [1,2]. One hundred thirty millions of people are symptomatic with 105 million bearing complication and 4.4

thousand of people die due to the disease [3]. Most of the schistosomiasis cases are found in sub-Saharan Africa, with *Schistosoma haematobium* (*S. haematobium*) and *Schistosoma mansoni* (*S. mansoni*) being the main species infecting humans [1,4].

The Democratic Republic of Congo (DRC) is one of the largest countries in Africa and one of the poorest countries worldwide. Years of war have left the country's health system in total disarray. Since a long time, schistosomiasis has been known to be endemic in certain provinces of DRC [5]. However, recent figures to support these data are not available. Indeed, the most recent national prevalence data available were generated over 30 years ago [6]. In 2009, the Ministry of Health adopted a national plan against neglected tropical diseases including schistosomiasis [7]. The main objective of the national plan regarding schistosomiasis is to reduce morbidity and mortality

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Foundation Project: This work was supported by the World Health Organization (WHO/TDR), project ID A61119.

Peer review under responsibility of Hainan Medical University. The journal implements double-blind peer review practiced by specially invited international editorial board members.

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of schistosomiasis. Efficient and sustainable implementation of this program requires an urgent update of the data on schistosomiasis in the DRC. The present study was conducted to assess the current knowledge of health staff on symptoms related to schistosomiasis and the available options for diagnosis and treatment of schistosomiasis at all levels of the primary health care system in the provinces of Kinshasa and Bas-Congo in the DRC.

2. Materials and methods

2.1. The DRC's health system: organizational framework

The health system in the DRC comprises three levels, namely the central level, the intermediate or provincial level, and the peripheral or operational level (Figure 1) [8]. The central level consists of the Ministry of Health and the Directorate-General. This level has a regulatory function. The intermediate level fulfills a technical supporting role by monitoring the application of guidelines, strategies and policies. The last level of the Congolese health system is the peripheral level which is divided into health zones [8,9]. Each health zone is divided in health area which is covered by at least one health center or health post.

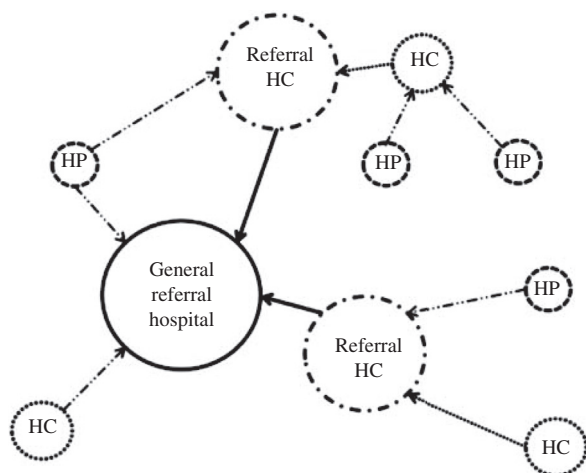


Figure 1. Tertiary health system level in the DRC.

The DRC is currently divided into 515 health zones with 393 general referential hospitals and 8504 health areas with at least one health center.

The provinces of Kinshasa and Bas Congo comprise 35 and 31 health zones, respectively. The health centers are usually better staffed than health posts which are typically run by nurses. Health centers are fairly well equipped, and small laboratory tests can be run and sometimes small surgeries can be performed [9].

2.2. Study area and selection of health zones

The present study was carried out between 2009 and 2011 in the provinces of Kinshasa and Bas Congo. The provinces cover an area of 63885 km², with Bas-Congo accounting for 53920 km². The city-province of Kinshasa is densely populated (677 km²) whereas in the Bas-Congo the population density is only 84 km². In 2012, the population of these provinces was estimated at 12 million inhabitants, of whom 4.1 million lived in the Bas-Congo [10]. Both provinces are known to be endemic for schistosomiasis [5,11]. A sample of 9 health zones was randomly selected in Kinshasa.

The two health zones in Bas-Congo (Kimpese and Nsona Mpangu) were selected based on a pilot study conducted in 2010 showing high prevalence of schistosomiasis in schoolchildren from both health zones (unpublished data, Dr Linsuke).

2.3. Interviews and data collection

Structured interviews with health staff were performed at different levels of the health care system, using an adapted version of a questionnaire developed for comparable studies in Northern Senegal and Mali [12,13]. In each health zone, the ‘médecin chef de zone’, who is the head of the health zone, was interviewed. The heads of health zones were asked about the presence (yes/no) of schistosomiasis cases in their health zones and how it was perceived by those who suffered from related symptoms. They were also invited to propose possible measures towards improved schistosomiasis control in their health zones. In the respective health facilities, interviews were conducted with the doctor or the nurse in charge of the general medicine department as well as with at least one laboratory technician. If the person in charge was not available, the interviews were conducted with the second in-command. Respondents were asked presence or absence of schistosomiasis, symptoms they considered to be related to infection with *S. haematobium* or *S. mansoni*. If *S. haematobium* or *S. mansoni* infection was reported not present in the studied area, further questions were not asked. If the infection was reported present, the interview continued with questions about the use and availability of diagnostic tests as well as prescription and availability of treatment. Availability of materials was studied by direct observation. Adequate functioning and use of the materials by the health staff was also studied by direct observation. Consultation fees as well as prices for diagnosis and treatment were also recorded.

2.4. Ethical consideration

The present study came from “Epidemiology and control of schistosomiasis in Democratic Republic of Congo (DRC) of today” research project. The protocol of this project was approved by the WHO Committees (project ID A61119) and the Ethical Committees of the School of Public Health, Kinshasa; DRC (reference number: ESP/CE/025/2007). In addition, the study also received clearance from the Ministry of Public Health. The head of health zone was informed about the study and the oral consent was obtained from the all participants.

2.5. Data analysis

The obtained data were entered into the Epi info[®] software (version 3.5.3). Schistosomiasis was assumed to be absent if the respondent in the facility was either unaware of schistosomiasis in the area or did not know whether schistosomiasis was present in the coverage area. To describe the knowledge of the health staff on schistosomiasis, proportions were calculated for each group according to the number of respondents by health areas. To estimate the median costs for treatment of schistosomiasis, the fees paid by the patient himself at the clinic were considered. These fees comprise the consultation's fees and, when applicable, the fees for further diagnostic tests and costs of treatment. Other costs such as transportation were not taken into consideration in the present study. Fisher Exact Test were used to compare proportions in the

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