Is Schistosomiasis present in Grand Kru County, Liberia, 2018?

KEYWORDS: Schistosomiasis, Prevalence, Surveillance, Grand Kru

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ABSTRACT

Introduction: Schistosomiasis is one of the neglected tropical diseases targeted for elimination. Estimates have it that there are 200,000 deaths annually in sub-Sharan Africa. Prevalence of *Schistosomiasis* is estimated at 25% in Liberia. Grand Kru County has not been benefiting from the national mass drug administration campaigns for *schistosomiasis* eradication because it is generally believed that *schistosomiasis* is not prevalent in Grand Kru County. We investigated to estimate the proportionate morbidity of schistosomiasis among health facilities attendees, Grand Kru County. **Methods:** We conducted retrospective chart review of 20,000 health facilities attendees´ medical records from selected health facilities in Grand Kru County from January 2013 to December-2017. Data was collected on sex, symptoms, laboratory diagnosis, and treatment. **Results:** The morbidity rate of *schistosomiasis* was 0.03% percent among hospital attendees over the 5-year period. Of the seven suspected cases, 5 (71%) were confirmed positive All the confirmed cases were male, with median age 12 (10 - 15) yrs. Specie in circulation was the *Schistosoma mansoni*. Common symptoms were abdominal pain and hematuria. All cases recovered after treatment with praziquantel. **Conclusion:** We determined that Schistosomiasis exists in Grand Kru County, though the morbidity rate is low. Therefore, there is a need to conduct a survey to estimate the prevalence of schistosomiasis in Grand Kru County.

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Introduction

Schistosomiasis is caused by parasitic worms, and is second only to malaria as the most devastating parasitic disease. [1,2] It is one of the most widespread neglected tropical diseases (NTDs) and still considered a key public health problem in about 77 developing countries in the tropics and subtropics. It is estimated that over 240 million people are infected, with about 700 million people worldwide at risk of infection. Over 90% of this infection occurs in sub-Saharan Africa with almost 300,000 deaths annually from schistosomiasis in Africa [3,4,5], WHO 2018. Morbidity of schistosomiasis is highest among school children, adolescents and young adults [6,7]. Untreated infections negatively impact academic performance and socioeconomic development in endemic areas [8,9].

Schistosomiasis is one of the neglected tropical diseases that is targeted for elimination by the NTDs program in Liberia. The disease is endemic in the northern of Liberia [10]. The two main species in circulation in Liberia are Schistosoma Mansoni and Schistosoma Haematobium [10].

Routine surveillance for schistosomiasis in Liberia is passive, dependent on affected persons reporting at the health facilities. However, 5-10 suspected cases reported from a cluster requires immediate investigation by surveillance officers and findings are shared with national (MoH) for further interventions.

In Liberia, the prevalence of S. haematobium and S. mansoni was estimated at 24% in 2010 [10]. Currently, Liberia is in the control phase of schistosomiasis [10,11]. In view of the uneven burden of the disease across counties, coupled with the limitation of resources, the national NTD program has set criterion to determine which county benefits from public health campaigns. Counties with estimated prevalence of schistosomiasis of11% and above are classified as endemic, and conduct annual and bi-annual mass drugs administration campaigns in addition to routine treatment of confirmed cases [10]. Non-endemic counties (estimated prevalence of 10 and below) do not benefit from these campaigns but treat cases at health facilities [10]. According to assessment by the national NTD program, Grand Kru County is classified as non-endemic and is therefore excluded from the national mass drug administration for the elimination of schistosomiasis on grounds that, the disease is non-existent in the County i.e. category of (0-10%). Transmission happens when affected persons pollute water sources through their excreta containing eggs. Some risk factors are coming in contact with the infested water while washing, paddling or swimming and also poor sanitation [5]. However, Grand Kru contain several water bodies like creeks, stagnant waters that serve as habitat for the snail vector of the parasite. The poor sanitary practices like open defection in the communities predisposes people to the infection. Recreation activities of the inhabitants like bathing, fishing and performing some household chores like washing in contaminated water source also serve as risks factors for the transmission of the disease [7].

Though schistosomiasis is considered nonexistent in Grand Kru, the county is also neighbored by three endemic counties. Inhabitants from these endemic counties commute between these counties for commercials and recreational purposes. Therefore, there is high likelihood of importing the disease into Grand Kru County. We reviewed hospital records for confirmed cases of schistosomiasis in Grand Kru County to estimate the proportionate morbidity of schistosomiasis disease in Grand Kru County and describe the findings by person, place and time. Our findings from the study will be shared with the NTDs division at the Ministry of Health to assist in decision making regarding the elimination of schistosomiasis in Liberia.

Methods

Study setting

We conducted the study in Grand Kru County which has an estimated population of 71,929. The county is located in the Southeastern part of Liberia along the Atlantic Ocean. Grand Kru County borders with Maryland and River Gee Counties which are endemic for schistosomiasis

Study Design

We conducted a retrospective chart review of health facilities attendees´ medical records at selected

health facilities for the period of five-years 2013-2017 [12].

We purposefully selected six health facilities which have laboratory services to confirm schistosomiasis by testing. We reviewed medical records of all attendees from January to December 2013-2017 at the selected health facilities. we selected all records of attendees who were confirmed for schistosomiasis for further data extraction from 2013-2017.

Study variables

We collected available information on age, sex, address, travel history, occupation, educational status, species of schistosomiasis and outcome of infected attendees who tested positive of schistosomiasis.

Data source and collection

We extracted data from health facilities attendees´ medical records, treatment and diagnostic ledgers and laboratory ledgers. Permission was sought from the county health team to have access to the health facilities data.

Data management and analysis

We cleaned and analyzed data using Microsoft Excel 2016 version to calculate rates and proportions.

Ethical Consideration

The Grand Kru county health team and the National Public Health institute of Liberia granted the permission to have the study conducted in Grand Kru County after assessing the benefits of the study.

Availability of data and material

The data upon which this write up is based belong to the Ministry of Health Liberia and are not publicly available. However, the data could be provided from the corresponding author with reasonable request and with permission from the Ministry of Health Liberia.

Results

Of the 20,000 health facilities records that were reviewed from the 2013-2017, we identified seven suspected cases of schistosomiasis. Of the seven suspected cases, five cases 71% (5/7) were confirmed positive of schistosomiasis. All the cases were Schistosoma *Mansoni*. The median age of the cases was 12 (10-15) years. All of the cases recorded were male and were all students. Of the six selected health facilities performing laboratory testing for schistosomiasis, cases were diagnosed from only 66% (4/6) of health facilities for the period under review. The hospital accounted for 75% (3/4) of the confirmed cases, with health center accounting for 25% (1/4) and a clinic accounting for 25% (1/4). Commonest signs and symptoms identified during the study were abdominal pain and hematuria. Praziquantel was the drug used for the treatment of those confirmed cases from the review. Additionally, the cases were all residents of Grand Kru County and have had no history of travelling from any of the endemic regions. The morbidity rate of the disease was 0.03 % (percent).

The year 2014 accounted for the highest (4/7) number of schistosomiasis cases in Grand Kru County **Figure 1**. The hospital accounted for 43% (3/7) of the cases that were reported **Figure 2**, Barclayville health District accounted for 57% (4/7) of the confirmed cases as depicted in the spot map **Figure 3**.

Discussion

We found out from the study that schistosomiasis exist in Grand Kru County with low morbidity rate. This low burden of schistosomiasis found from the study concords with similar findings from MoH/NTDs mapping, 2015 (NTDs/ MoH 2015) which showed that Grand Kru is in the non-endemic region in Liberia. The laboratory records showed confirmed cases of *Schistosoma Mansoni*. This laboratory finding further agrees with MoH/NTDs mapping, 2015 (NTDs/ MoH 2015) findings that *Schistosoma Mansoni* is one of the common species in circulation in Liberia [10]. Barclayville health District accounted for majority of the cases probably due to the facts that it has many creeks and rivers which may serve as habitat for the fresh water snail. These findings put Grand Kru County in the

non-endemic region or category of (0-10%) and thus Grand Kru County does not require mass drugs administration according to the NTDs program in Liberia. Furthermore, it was revealed from the study that males were affected which is similar to a study done in Kano state, Nigeria were males were the commonly affected group [3]. Additionally, adolescent was the affected group. This is similar to study done in Tanzania [11]. Adolescent males were affected in this study probably because they are more likely to participate in swimming and playing in creeks and rivers.

The cases that were discovered were all from community within Grand Kru County which has freshwater that can serve as habitat for the snails.

However, the low detection of schistosomiasis cases at health facilities could just be a tip of the icebergs of what happens among residents with the disease in the community.

Limitation

Our findings are subject to several limitations. Firstly, the morbidity rate may not be representative of the general population in Grand Kru County due to the fact that the study was conducted in selected health facilities which has capacity to test for schistosomiasis. However, these health facilities included the only referral hospital where all suspected cases could be referred. Especially, if there is no means of confirmatory diagnosis at the primary health center. Missing data was also an issue as a result of poor storage of hospital records. Despite these limitations, the findings have given us firsthand information on schistosomiasis in selected health facilities in Grand Kru County.

Conclusion

Schistosomiasis exits in Grand Kru County but with a low morbidity rate. To improve the detection of schistosomiasis, more school and community-based health education regarding the manifestation of the disease, the mode of transmission and prevention will help to reduce the transmission and morbidity of schistosomiasis.

Although, the disease is known to be endemic in the northern part of Liberia, this study in Grand Kru which is in the southern part of Liberia, has shown confirmed cases of schistosomiasis.

Recommendations

We therefore recommend that a cross sectional study be conducted to establish the prevalence of schistosomiasis in Grand Kru. Also, will recommend to the county health team and the ministry of health to strengthen schistosomiasis surveillance.

What is known about this topic

- Schistosomiasis disease is known to be prevalent in the northern and central regions of Liberia to that of other regions.
- The snail population density and infection rate vary with seasons, higher in dry seasons and lower in rainy seasons.
- Adolescent or school going children are at more risk of getting infected due to their habits.

What this study adds

- The study adds knowledge on the high possibility of schistosomiasis cases being imported to Grand Kru from surrounding counties that are endemic with schistosomiasis.
- The study provides to the body of knowledge baseline evidence of schistosomiasis in a non-endemic area of Liberia.
- The study highlights the need for study to be conducted to determine the real prevalence of schistosomiasis in Grand Kru.

Competing interests

The authors declare no competing interests.

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Authors' contributions

Emmanuel Ghartey was involved in the design and conduct of the study and led in the development of this manuscript. Fulton Quincy Shannon II, aided and provided technical expertise in the collection and analysis of the data. Peter Adewuyi and Maame Amo-Addae served as a co-reviewers of the manuscript. they provided technical guidance on the development of the abstracts and contributed to the study design of the research, analyzed the results and contributing to the overall writing of the manuscript. Himiede Wede Wilson aided in the development of the background section of the manuscript. Provided guidance in using referencing software to do in text citation. She provided general support throughout the development. Olayinka Stephen Ilesanmi aided in the data analysis of the manuscript. He provided technical expertise or details in the collection and analysis of the data. He contributed to the development and presentation of data on the spot map. Thomas Knue Nagbe provided general support to the manuscript writing. Obafemi Joseph Babalola contributed to the discussion part of the manuscript. He provided guidance on literature review and how to compare findings from different studies in the discussion´s aspect of the manuscript. All authors discussed the methods and results and contributed to the final manuscript.

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Figures

Figure 1: Distribution of cases by year, Grand Kru County, 2013-2017

Figure 2: Distribution of cases by health facilities, Grand Kru County, 2013-2017

Figure 3: Distribution of cases by health Districts, Grand Kru County, 2013-2017

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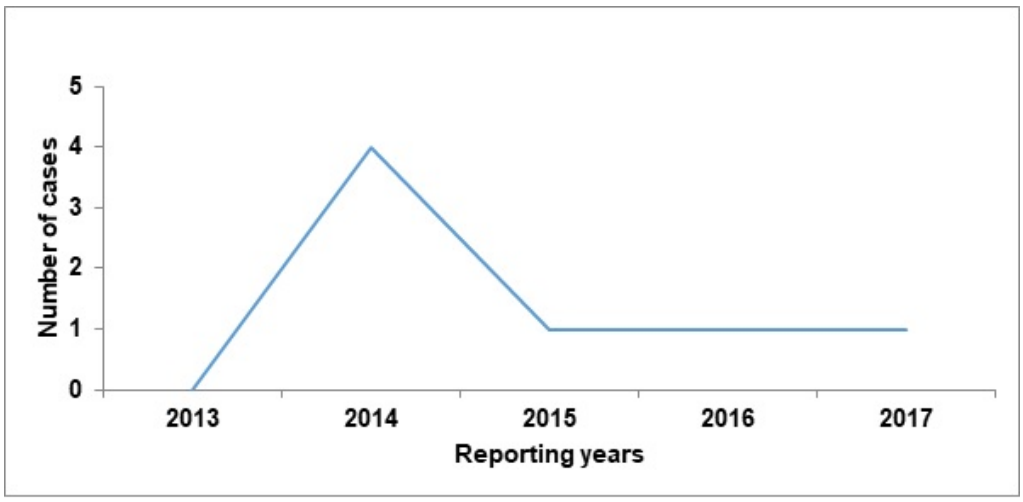

Figure 1: Distribution of cases by year, Grand Kru County, 2013-2017

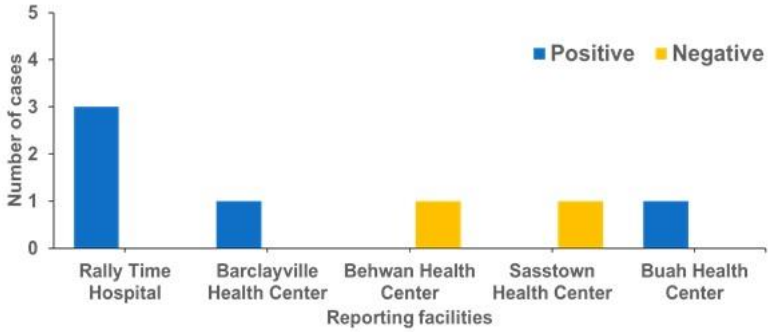

Figure 2: Distribution of cases by health facilities, Grand Kru County, 2013-2017

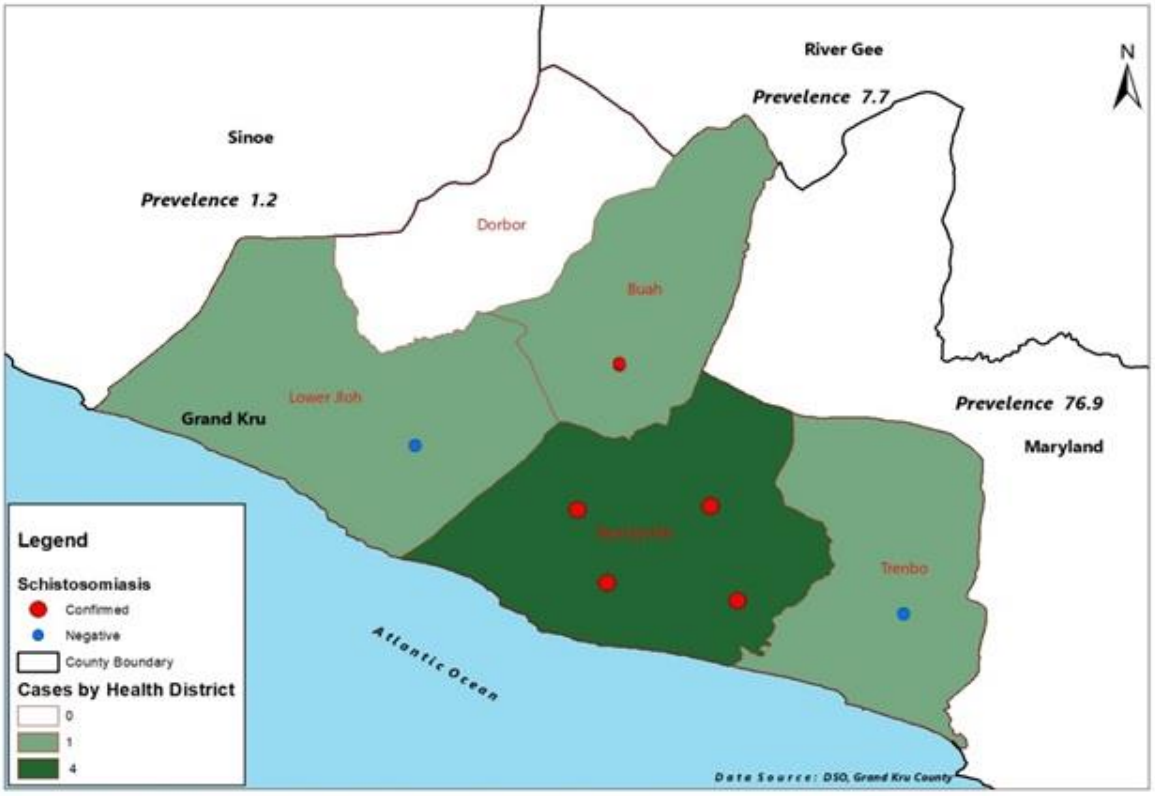

Figure 3: Distribution of cases by health Districts, Grand Kru County, 2013-2017