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ORIGINAL RESEARCH

New Foci for *Schistosoma mansoni and S. Intercalatum* in Ogbia Local Government Area, Bayelsa State, Nigeria

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ABSTRACT
A survey of schistosomiasis was carried out in Ebelebiri, Imiringi, Elebele and Kolo communities of Ogbia Local Government Area of Bayelsa State, Nigeria, within the months of April and August, 2015. The survey revealed the presence of *Schistosoma mansoni* and *S. intercalatum*. The survey showed that out of the 320 children examined for the presence of ova of shistosomes, 17.81% were found to harbour *S. mansoni* while 12.81% had *S. intercalatum*. The incidence rate was not uniform among the four communities with Kolo community having the highest incidence rate (9.38%), followed by Ebelebiri community (8.75%), Imiringi, and Elebele communities had 7.18% and 5.31% respectively for both parasites. This is the first time these parasites have been documented in this part of the country and the implication discussed.

KEY WORDS: *S. mansoni, S. intercalatum, Kolo Creek, Incidence*

Introduction

Schistosomiasis refers to infection caused by trematode fluke worms that are transmitted by fresh water snails (Idogho *et al*., 2014; Mazigo *et al*., 2012). It is the most prevalent of water borne diseases and one of the greatest risks to health in rural areas. Schistosomiasis, or bilharziasis, as is also known in many countries, is named after the German physician, Theodor Bilharz, who first described the urinary cause of the disease in 1851 (Ross *et al*., 2002). It is a vector borne parasitic infection that affects humans, wild animals and domestic animals causing damage to internal organs (Izah and Angaye, 2016).

The first scientific report of schistosomiasis in Nigeria can be traced back to 1935 when Ramsey made an extensive study in the old Northern Nigeria.

This study was, therefore, undertaken to evaluate the status of schistosomiasis in some of the communities in Ogbia LGA, Bayelsa State, Nigeria. It is the first epidemiological survey for schistosomiasis in the present study locations.

Materials and Methods

Study Area

The survey was undertaken in four (4) communities - Ebelebiri, Imiringi, Elebele and Kolo in the Ogbia Local Government Area of Bayelsa State. The Kolo Creek, which lies along the study communities, is a small, narrow stream which bifurcates from the Orashi River at Okarki Town in Rivers State and courses through fifteen communities in Ogbia Local Government Area of Bayelsa State (Bassey *et al.,* 2013). The climate of the area is characterized by a dry season (November – March) and wet season (April – October). The annual rainfall varies between 2500 –

3000mm. Mean temperatures are as high as 32^{o}C with humidity of about 81% in the dry season and about 92% in the wet season (Bassey *et al.,* 2013). The inhabitants' predominant occupation is farming and fishing. Some are engaged in petty trading and some are civil servants. The main sources of water are rivers, rain water stored in tanks and a few boreholes owned by some individuals.

Parasitological Survey

The survey was carried out between April and August, 2015 among pupils of Primary School within the ages of 3-15years. The consents of their parents, guardians and school authorities as well as local authorities were sought through formal writing and permission obtained as an ethical clearance. Pupils who consented to participate were enrolled but those who admitted to have received anti-helminth drugs three months before the survey were excluded from the study. All stool samples were immediately transported to the Medical Microbiology and Parasitology Laboratory of the Niger Delta University, Amassoma, Bayelsa State, for analysis.

Each stool sample was examined for its consistency (liquid, loosed, semi formed or formed), presence of blood, and mucous. An approximately 1g of faeces from each sample was fixed in 10% formalin, and washed severally in saline solution until a clear supernatant was obtained. The supernatant was then spurned, decanted, and the entire sediment at the bottom of the centrifuge tube shaken, poured on to a slide and examined under the microscope using x10 and x40 objectives lenses for eggs of *Schistosoma.*

Results

A total of 320 stool samples were examined. The overall infection with *Schistosoma* spp. showed an infection rate of 30.62% with *S. mansoni*, 17.81% and *S. intercalatum,* 12.81% (Table 1). The incidence rates of the parasites were not uniform among the four communities. Kolo had the highest incidence rate of 9.38%, followed by Ebelebiri (8.75%). Imiringi, and Elebele had 7.18% and 5.31% respectively for both parasites (Table 1).

Discussion

Schistosoma intercalatum is a parasitic worm found in parts of Western and Central Africa. *S. intercalatum* is one of the major agents of the rectal form of schistosomiasis. It is a trematode, and being part of the *Schistosoma* genus, it is commonly referred to as a blood-fluke since the adult resides in blood vessels (Izah and Angaye, 2016). Humans are the definitive hosts and two species of freshwater snail make up the intermediate host, *Bulinus forskalii* and *Bulinus africanus* (Tchuen *et al.,* 2003).

There are two major strains of *S. intercalatum*, both living in forested areas of Africa. One strain lives in the Congo area, particularly Zaire, and the other strain lives in the Lower Guinea area, mainly in Cameroon (Bjorneboe, 1978). Cameroon is a place of scientific interest because it is where all three species of human schistosomes live (Tchuen *et al.,* 2003). Most relevant research conducted on *S. intercalatum* was performed in, or around, the Loum area in Cameroon (Southgate, 1976). This survey did not consider which of the strains is found in Bayelsa State.

The clinically defining characteristic of most schistosome species are their eggs' size and shape. The eggs of *Schistosoma intercalatum* have a terminal spine somewhat curved at the end and tend to be moderately larger than those of *S. haematobium* (approximately 130 × 75 µm). The origin of the name '*intercalatum*' is from the observation that their eggs are of an intermediate range between the smaller *S. haematobium* and larger *S. bovis* (Yamada *et al.,* 2008). These eggs are unique because they will stain red when exposed to the Ziehl-Neelsen technique, aiding in identification (Southgate, 1976). When viewed using scanning electron microscopy, it can be observed that the *S. intercalatum's* surface has a much lower amount of integumental elevations, or bosses, than *S. mansoni*. This feature is consistent with the tegument appearance of other terminally spined schistosomes (Kutz, 1977).

S. mansoni, usually diagnosed by the typical lateral spine of the egg, is the most widespread of the human-infecting schistosomes, and is present in 54 countries. These countries are predominantly in South America and the Caribbean, Africa including Madagascar, and the Middle East.

S. mansoni is commonly found in places with poor sanitation. Because of the parasite's fecal-oral transmission, bodies of water that contain human waste can be infectious. Water that contains large populations of the intermediate host snail species (Biomphalaria) is more likely to cause infection. Young children living in these areas are at greatest risk

Table 1: Incidence of *Schistosoma mansoni* and *S. intercalatum* in Ebelebiri, Imiringi, Elebele and Kolo, Bayelsa State, Nigeria *(Figures in Parentheses are %)*

Community	No examined	*S. mansoni*	*S. intercalatum*	Total_
Ebelebiri	68	16(5.00)	12(3.75)	28(8.75)
Imiringi	75	15(4.68)	8(2.50)	23(7.18)
Elebele	80	10(3.13)	7(2.18)	17(5.31)
Kolo	97	16(5.00)	14(4.38)	30(9.38)
Total	320	57(17.81)	41(12.81)	98(30.62)

because of their tendency to swim and bathe in cercaria-infected waters longer than adults (Ahmad and Bassey, 2010).

Conclusion/Recommendations

More studies should be carried out to ascertain the strains of *S. intercalatum* in the State. Efforts should also be made to map out the schistosomisis pattern and to educate the communities about the disease.

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