LETTER TO EDITOR

Schistosomiasis in Nigeria: a need for monitoring and evaluation

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Agulu Lake community in Anaocha Local Government Area has been known to be *Schistosoma* endemic (1-3). However, our recent sampling of the area revealed the presence of *Schistosoma haematobium* ova with atypical morphologies in humans.

Schistosomiasis is a disease caused by parasitic worms of the genus *Schistosoma*. Schistosomiasis is a neglected tropical disease prevalent in the tropics and subtropics particularly in poorer communities without access to safe drinking water and adequate sanitation. More than 207 million people worldwide are infected with schistosomiasis, 85% of who live in Africa with Nigeria having the highest number of infected people in the world. Schistosomiasis is endemic in every state in Nigeria including the federal capital territory (4). Schistosomiasis in children can cause anemia, stunted growth and a reduced ability to learn and in adults, poor reproductive health including sexual dysfunction and infertility (5). *Schistosoma haematobium* causes urogenital schistosomiasis which may be asymptomatic or maybe characterized by genital ulcers in adult men and women and haematuria and proteinuria in children (6). *S. haematobium* is diagnosed by detection of parasite egg in urine specimen.

Several authors in recent times have reported the observance of atypical *S. haematobium* eggs in Africa and in Europe (7-8) and have attributed it to an introgression between genes of human *S. haematobium* and zoonotic *S. bovis* through hybridization process. Hybridization is a phenomenon whereby two closely related species interbreed to form a new variety which could eventually lead to the evolution of a new disease. In our recent pilot study conducted on Agulu Lake community dwellers, sample size for the pilot was not sufficient to establish prevalence of *S. haematobium*. However, our examination of the indigenes of Agulu lake area with the aid of questionnaires revealed factors that could lead to hybridization. For instance, although many parents restrict their children from visiting the lake, many pre-adolescents and adolescents nevertheless visit the stream to fish and to play. Women also visit the lake to wash clothes and fetch water for domestic use. Men irrigate their vegetable farms on the shores of the lake and obtain bamboos from the lake shores to use for cooking in their homes and for commercial sales for building of homes. Most homes in the community only have pit toilets and as a matter of convenience or habit, residents of the area simply prefer to urinate and defecate outdoors.

Another important risk factor in Agulu lake community which is also common in south-Eastern Nigeria is that people take cows, goats and other ruminants to sacrifice to the river deity “Alusi”, and these animals are taken into the lake first where they are kept for a while sometimes overnight before their eventual slaughter. Sharing of the same water bodies by animals and humans could result in human-animal parasite interactions.

Molecular analysis (gene sequencing) of miracidia hatched from Schistosoma eggs isolated from Agulu lake area and other areas in the country is required to confirm/refute the hybridization hypothesis as morphological evidence alone could be misleading. If hybrids are indeed present in Nigeria, investigations into the genetic makeup of the hybrids is necessary.

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In other words, which Schistosoma species crossed, resulting in hybrids? How susceptible are the hybrids to the treatment of choice – praziquantel? What is their "preferred" intermediate snail host? How severe are the associated morbidities?

During our visit to Agulu lake community, we also observed an abundance of *Biomphalaria* snails in the area. *Biomphalaria* species is the intermediate snail host for *Schistosoma mansoni*. An elaborate investigation of snail species was carried out in the area from 2012 to 2013. Among the rich snail fauna found in the area, *Biomphalaria* snail species was not identified as present in the area (9). This was not unexpected as studies have confirmed that *S. mansoni* transmitted by *Biomphalaria* snails is not endemic in south eastern Nigeria (10).

Our recent observation of *Biomphalaria* snails therefore around the banks of the Agulu lake area from our visit was unexpected and could be indicative of new introduction of *Biomphalaria* species in the area. As a result of their fast proliferation rates, *Biophalaria* snails could quickly become established in an area following their introduction. Prevailing climatic factors in the area, anthropogenic activities and ecological changes (in pH and salinity) can contribute to the emergence and eventual spread of *Biomphalaria* species and could have implications for *Schistosoma* epidemiology in the area. This was the case in Cameroon where human activities and climate change led to the novel establishment of *Bulinus* snails which eventually led to a complete switch from intestinal schistosomiasis to urinary schistosomiasis in the area (11).

There are no new studies on presence/absence of *S. mansoni* in the area. However it is worthy of note that only recently, researchers reported the observance of trematodes parasites with cercariae indicative of *Schistosoma* species, although not backed by molecular analysis; and eggs of *S. mansoni* were not found in faeces of subjects examined (12). The absence of *Schistosoma* eggs in urine/stool specimen is however not always an indication of absence of *Schistosoma* infection, there is therefore urgent need to carry out elaborate investigation of the presence/emergence of *Biomphalaria* species along the banks of Agulu lake and the possible incidence of *S. mansoni* in the area and in other areas in South-eastern Nigeria using more sensitive available methodology. Also, possible reasons for these occurrences, their implications and effective control/prevention of further spread should be sought if vision 2020 of eliminating five neglected tropical diseases in Nigeria (including schistosomiasis) is ever to be achieved.

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