

## RESEARCH PAPER

# Prevalence of *Schistosoma haematobium* infection among primary school children in Auyo Town, (Jigawa State) of Nigeria

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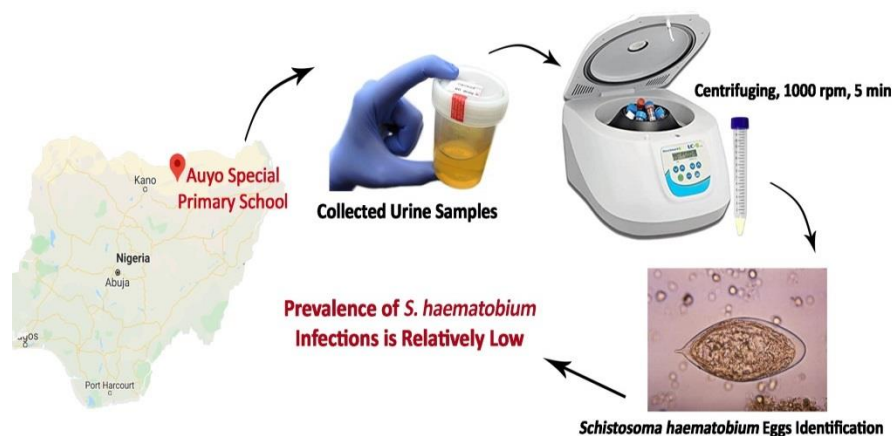
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## Highlights

- Public awareness programs on Schistosomiasis contamination with human urine and feces are urgently needed.
- Policy maker should recognize the disease as a focal public health problem.
- High-risk groups should access to regular treatment programs in working environ.

## Graphical Abstract



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## Abstract

The Fulani tribe of Northern Nigeria brought Schistosomiasis with them during their migration from the Upper Nile Basin. Formerly, Schistosomiasis was not paid attention in the studied area for two reasons. Firstly, Schistosomiasis was confining to provincial networks where cleanliness is insufficient, destitution wins and unhealthiness and contamination with different parasites are normal. Secondly, Schistosomiasis is known common between school aged children so that the disease remains soundless or sans asymptomatic long-term. The world Health organization (WHO) views the malady as disregarded tropical illnesses; with an expected 732 million man, being helpless against disease worldwide on eminent transmission territories detailed that immunodiagnostic technique is best. Hence, the present study aims to control the disease by eradicating the intermediate host and the use of Praziquantel and chemotherapy application. For this purpose, 100 urine samples were collected into clean universal containers between 9:30AM to 10:30 AM local time. The sample analysis is done according to Cheesbrough (1998). Results show that the predominance of urinary Schistosomiasis was most noteworthy in the age gathering of 12-13 years. This might be since youngsters in this age section were as often as possible associated with exercises that acquire them contact with the wellsprings of disease, for example, contact with transitional host snails, washing in debased water among others.



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## 1. Introduction

Schistosomiasis or bilharzia is one of the most widespread of all human tropical parasitic diseases caused by blood-dwelling fluke worms of the genus *Schistosoma* (Di Bella et al., 2018). Grown-up schistosomes are white or grayish worms of 7–20 mm long with a tube-shaped body that highlights two-terminal suckers, an unpredictable covering, a visually impaired stomach related tract, and conceptive organs. In contrast to different trematodes, schistosomes have separate genders (Zhou et al., 2016).

A groove or gynaecophoric channel is created in the male's body, holding a longer and thinner female. As for all-time grasped couples, the schistosomes live inside the perivesical (*Schistosoma haematobium*) or mesenteric (different species) venous plexus. Schistosomes feed on globulins and blood by anaerobic glycolysis. The trash is disgorged in the host's blood. The females produce hundreds (African species) to thousands (oriental types) of eggs every day. Every ovum contains a ciliated miracidium hatchling, which infiltrates the freshwater snails. The infection is spread by contact with freshwater tainted with the parasites. The infection is particularly normal among youngsters in creating nations as they will probably play in polluted water (Zhou et al., 2016).

Besides, anglers, farmers, and people who use unclean water are of high-risk groups (Nyati-Jokomo and Chimbari, 2017). Thru finding eggs of the parasite in a person's urine or stool, the disease is diagnosed. Also, antibodies against the disease in the blood could be a symptom of the disease.

Intense Schistosomiasis or Katayama condition can present as fever, disquietude, myalgia, weariness, and non-gainful hack, loose bowels (with or without blood) are a few manifestations of the malady (Doherty et al., 1996). *Schistosoma haematobium* (hematuria) furthermore, right upper quadrant torment ceaseless and propelled maladies results from the host's safe reaction to *schistosomes* eggs stored in tissues and the granulomatous response evoked by the antigens they emit (*S. mansoni*, *S. japonicum*, *S. intercalatum*, and *S. mekongi*) cause intestinal infection. *S. haematobium* causes urinary sickness. Neuro schistosomiasis is the most serious clinical condition related to *schistosomes*' contamination, Disease. Praziquantel remains the treatment of decision, albeit others are being explored; preventive chemotherapy is with a solitary oral portion of Praziquantel (Chuah et al., 2019).

Schistosomiasis is one of the most widespread of all human parasitic sicknesses, positioning second just too intestinal sickness as far as its financial and general wellbeing significance in tropical and subtropical territories (Cox, 2002; Wu et al., 2016). Likewise, it is the most pervasive of the waterborne illnesses and perhaps the most serious hazard to wellbeing in rustic cultivating territories of creating nations as a fundamental country, regularly word related infection. This research's conduct is due to the incidence of new cases of the disease spreading in this local area according to the clinic data and availability of the intermediate host (*snails biomphalaria* and *bolinus* species) in the area throughout the year.

## 2. Materials and Methods

### 2.1. Study area

This study was conducted at Auyo Special Primary School, Auyo town, a local Government Area of Jigawa State, Nigeria. Its headquarters are in the town of Auyo. Auyo lies between coordinates 12°21'36" N and 9°59'8" E. It has 512 km<sup>2</sup> and a population of 132,001 (Ravindra et al., 2019). It also has 10 political wards, which include Auyo, Auyokayi, Ayama, Gatafa, Gamafoi, Gamsarka, Kafur, Tsidir, and Unik. Two rainy (between April and October) and dry seasons (November to March) were reported for the study area. Individuals of the zone are tainted by contact with cercaria-invaded water utilized in ordinary day-by-day exercises, such as individual or household cleanliness, swimming, or proficient exercises, such as angling and rice development, and irrigation. These are the important exercises of the individuals in the territory.

### 2.2. Sample collection

100 urine samples were collected into clean universal containers between 9:30 AM to 10:30 AM local time. After vigorous shaking, the samples were stored in the container and transported to the Biological Science laboratory, Sule Lamido University, Kafin Hausa, Jigawa State, for examination immediately after collection.

### 2.3. Laboratory analysis and examination of samples

The example examination is finished, and every pee test was appropriately shaken, and around 10 ml was moved to a funnel-shaped cylinder and centrifuged at 1000 r.p.m. for 5 minutes. The residue (after disposing of the supernatant) was moved to a spotless dry glass slide secured with a spread slip, and the dregs were analyzed infinitesimally utilizing amplification of 10x with the condenser iris shut adequately to differentiate while 40x amplification was utilized for the ID of terminal spine eggs of *Schistosoma haematobium*.

### 3. Results and Discussion

Table 1 shows the distribution of Schistosomiasis with respect to class. As the  $P > 0.05$ , it can be demonstrated that there is a significant difference

Table 1. Distribution of Schistosomiasis with respect to class (Ibikounla et al., 2009).

S/N	Class	Pupils Examined No.	Infected No.	Infected %
1	3	20	6	18.75
2	4	23	6	18.75
3	5	35	13	40.63
4	6	22	7	21.87
	Total	100	32	100

Table 2 shows the conveyance of Schistosomiasis as forage. As the  $P < 0.05$ , it very well may be shown that there is no critical distinction between the various ages.

Table 2. Distribution of Schistosomiasis with respect to age.

S/N	Ages (years)	Pupils Examined No.	Infected No.	Infected %
1	9-10	43	12	37.5
2	11-12	49	19	59.38
3	13-14	8	1	3.13
	Total	100	32	100

Moreover, as it is shown in Table 3, there is a significant difference in the Distribution of Schistosomiasis with respect to weeks because of the determined  $P < 0.05$ .

Table 3. Distribution of Schistosomiasis with respect to weeks.

S/N	Weeks No.	Pupils Examined No.	Infected No.	Infected %
1	1st	15	7	21.875
2	2nd	18	6	18.75
3	3rd	25	5	15.625
4	4th	25	9	28.125
5	5th	17	5	15.625
	Total	100	32	

Based on Table 2, which is relevant to Schistosomiasis' distribution with respect to age, the prevalence of urinary Schistosomiasis was highest in the age group of 12-14. This might be since kids in this age where every now and again associated with exercises that acquire them contact with the wellsprings of contamination (Hoover et al., 2019). Numerous species subordinate variables identified with the idea of contact (for example, the recurrence or all out the length of contact, the amount of the body is uncovered, and when) may add to the

probability of experiencing infective cercariae. In another study, the prevalence of Schistosomiasis in school children in Plateau State was recorded (Nyati-Jokomo and Chimbari, 2017). As one of the nation's known to be profoundly endemic for urinary Schistosomiasis, Nigeria assessed 101.28% million men (Noriode et al., 2018).

The 12-14 years age bunch likewise sullies the streams with their pee, which may contain the parasites' eggs, so going about as a wellspring of transmission of the infection. The consequences of this investigation likewise show that the pervasiveness of the malady isn't age subordinate. However, there was an increment in the commonness pace of ages from more youthful to more established understudies. This perception demonstrated that the disease relies upon the wellsprings of water gracefully. It has been seen that the transmission of schistosomiasis happens where freshwater snail vectors are available and where there is contact between the populace and contaminated water (Cui et al., 2018). In this manner, the recorded instances of disease among kids utilizing wells, lakes, and streams might be because of the way that these sources were debased with cercariae (Noriode et al., 2018). In another study recorded the prevalence of Schistosomiasis in school children in the plateau state (Yihunie et al., 2019). In other surveys, the infectious diseases in a drought-afflicted community in Northern Nigeria were determined, the prevalence of urinary Schistosomiasis in Jos as 18.3% recorded, Nigeria as one of the countries known to be highly endemic for urinary Schistosomiasis with estimated 101.28% million people (Noriode et al., 2018; Silva et al., 2007).

The consequences of this investigation, dissimilar to the aftereffect of some previous examinations show that the pervasiveness of the malady isn't age subordinate although there was an increment in the predominance pace of ages from more youthful to more established students. It has been seen that the transmission of schistosomiasis happens where freshwater snail vectors are available and where there is contact between the populace and contaminated water (Cui et al., 2018). Subsequently, the recorded instances of disease among youngsters utilizing lakes and streams might be because these sources were debased with cercariae. Freshwater snails are the intermediate host of schistosomiasis (Ibikounla et al., 2009). In South Asia, especially India and Thailand, indoplanorbis snails Harbor cercariae of several kinds of flukes, a total of 2802 molluscan of different species from two fish ponds and one swamp in the Czech Republic were all investigated. 33.9% of species were infected by larva trematodes of 28 species (Wu et al., 2016).

#### 4. Conclusion

This study's findings clearly show that the commonness of S.haematobium contaminations among school-matured youngsters in Special Primary School Auyo, Auyo Local Government Area, is moderately low.

#### Recommendations

Therefore, endeavors should be strengthened to keep up levels underneath the limit and kill urinary Schistosomiasis in the investigation region.

It is recommended that efforts should be made to avoid further spread of the disease by the followings:

- a) Detection and treatment of infected individuals.
- b) Periodic survey of water bodies for intermediate snail hosts and detected eradicated.
- c) Public awareness programs on Schistosomiasis water for domestic use protection from contamination with human urine and feces, some of which may contain the eggs of schistosomes.
- d) Policymakers should recognize the disease as a focal public health problem and should be willing to promote and support control where and when necessary.
- e) High-risk groups, including anglers and irrigation workers, should have regular screening and treatment programs for appropriate prevention measures in the working environment.

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