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Original Research Article

Urinary Bilharziasis in the Markala Health District

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Abstract: Context and objective Schistosomoses or bilharziasis constitute the second world parasitic endemia after malaria, the objective of our study was to generally study urinary bilharzia at the Markala reference health centre. ***Patients and methods*:** It was a transversal and descriptive study carried out in the Markala reference health center on the cases of urinary bilharzoses diagnosed and treated on the basis of paraclinical investigations over a period of 29 months from January 2019 to June 2021. At the end of this study, it appears that 62 cases of urinary bilharziosis had been diagnosed, including 19 associated tumours. The average age of our patients was 28 years, with extremes ranging from 04 to 75 years. Male sex was most represented with 48 cases or 77.4%. The bambaras were the most affected ethnic group or 43.5% with a clear provenance of the Markala district (43.5%). We recorded 18 cases of chronic kidney failure, 29%, followed by chronic cystitis (19.4%). The radiological aspects of sequelae of the most found uro-genital bilharzia were: bladder tumors with 67.7%; Calcifications (ureteral and bladder) represented 32.3%; and Bilharzian cystitis (40.32%). Calcifications (ureteral and bladder) according to the topography were noted respectively 22% and 10.3%. ***Conclusion:*** A real public health problem Bilharziasis occupies second place in parasitic conditions in Mali. It represents a real obstacle to economic development because touching the most active age of the population. The paradox of bilharziasis is that, the irrigated areas, fitted out to ensure food self- sufficiency and hydroelectric dams contribute to the progression of the Bilharzian infestation.

Keywords: Bilharzia, tumor, hematuria, cystitis, markala.

I. INTRODUCTION

Schistosomiasis or bilharzia is the world's second most common parasitic endemic after malaria: 230 million people in 52 countries require annual treatment. 80 to 90% of them live in Africa; almost 800 million people are exposed to the risk of infection. Schistosomiasis is responsible for 800,000 deaths a year [1].

These are parasitic diseases caused by flatworms (schistosomes or bilharzia), transmitted by urine or faeces, involving intermediate hosts (freshwater molluscs) and whose symptoms reflect the lesions caused by migration. These diseases are spreading, directly linked to agricultural development and the increase in irrigation networks (water), raging in outbreaks in an endemo-epidemic mode [2].

Schistosomiasis is endemic in Mali. The urinary form is the most widespread, with two and a half million people infected. It is estimated that around one person in four suffers from bilharziasis [3].

It is the leading endemic parasite linked to water. The groups at risk are: School-age children, fishermen, farmers working in irrigated areas and women

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who often have to "fetch" water (washing clothes, food requirements) [4].

The areas most affected are hydro-agricultural development zones (Office du Niger, Plateau Dogon, Baguineda) and villages located along rivers in the regions of Ségou, Koulikoro, Mopti and in the district of Bamako, with a prevalence rate of over 50% [5]. The areas of the Senegal River basin in the Kayes region constitute the second most important focus of bilharziasis endemicity in Mali [6].

More than 70% of school-age children are infected in villages along the Senegal River, as well as in villages in the Office du Niger and the Dogon Plateau [5].

Studies have shown that urinary bilharziasis is a major cause of morbidity in Mali. Even in areas where the prevalence is low, bilharziasis is responsible for 15% of severe and dreadful lesions in the urinary tract [1].

Urinary bilharziasis infestations are numerous in our country, specifically in the 4th region of Mali, where it is endemic among the population of the district, hence the interest in carrying out a study of urinary bilharziasis at the Markala reference health centre. The objectives were to study urinary bilharziasis in general and specifically at the Markala reference health centre.

II. PATIENTS AND METHODS

This was a cross-sectional, descriptive study conducted in the Markala reference health centre on cases of urinary bilharziasis diagnosed and treated on the basis of paraclinical investigations over a 29-month period from January 2019 to June 2021.

1-Study Framework

Our study took place in the Uro-Chirurgie department at the Csréf in Markala.

Sampling

Inclusion criteria Our study included all patients presenting with clinical signs of urogenital bilharziasis referred to the Radiology and Nuclear Medicine Department for radiological investigations (ultrasound, U.IV, A.S.P and cystoscopy and uroscanner).

All cases of Bilharzia not confirmed by paraclinical examination outside our study period. Data were collected on a survey form from: Consultation record book, ultrasound and ECBU reports.

The variables used were clinical, paraclinical and sociodemographic data: haematuria, abdominal pain, hypogastric pain, dysuria, pollakiuria and tingling, ultrasound and ECBU, uroscanner; biopsy, cystoscopy Age, sex, occupation, ethnic group and place of origin. The data were entered into Windows Excel 2007 from the survey forms and analysed using SPSS version 21.

III. RESULTS

1-Frequency:

During the study period, we recorded 62 cases of bilharziasis out of 1342 consultations, i.e. an overall frequency of 4.61% in the Markala health district, 62 cases of bilharziasis out of 862 cases of urological pathology, i.e. 7.19%, and 62 cases of bilharziasis out of 202 cases of hospitalisation, i.e. 30.69%.

2-11-DIAGNOSIS YEAR

Of the 62 cases of bilharziasis included in our study, 16 were diagnosed in 2019, i.e. 25.8%, 15 in 2020, i.e. 24.2%, and 31 in 2021, i.e. 50%. The highest number of cases was diagnosed in 2020 (50%).

2) Epidemiological Data:

2-1-AGE

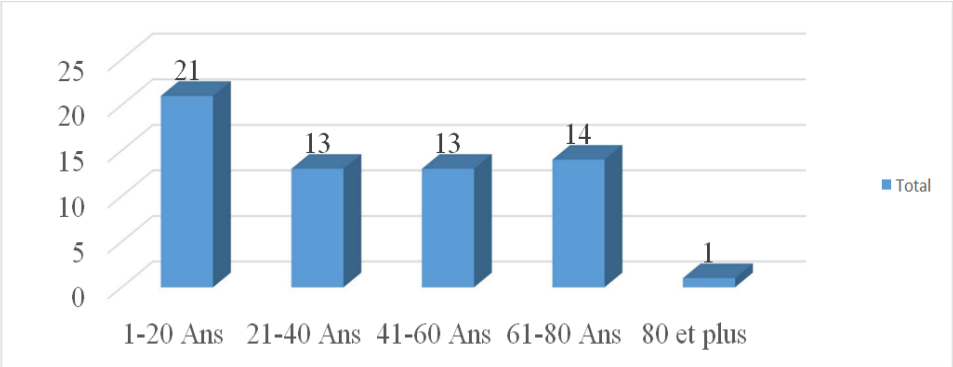

Figure 1: Age distribution of patients

The average age of our patients was 28, with extremes ranging from 04 to 80 years. The 5-20 and 61-80 age groups were the most represented, with 33.9% and 22.6% respectively.

2-2-SEX

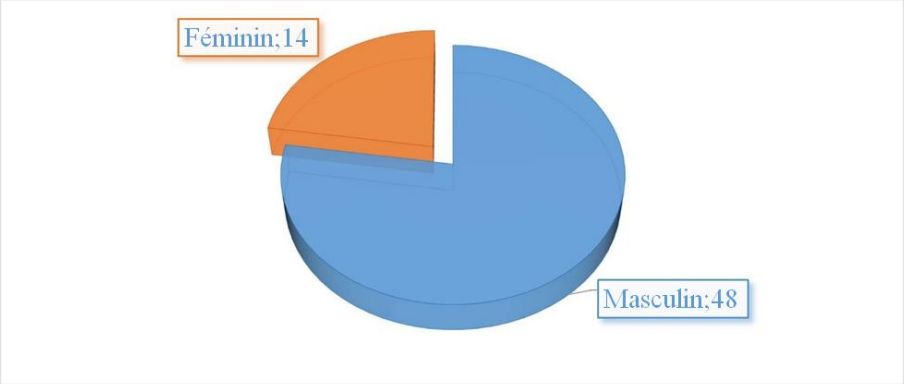

Figure 2: Breakdown by gender

The male sex was the most represented, with 48 cases (77.4%).

PROFESSIONS

Table 1: Breakdown by occupation

Profession	Workforce	%
Retailer	3	4,8
Cultivator	15	24,4
Student	07	11,3
Breeder	1	1,6
Child	4	6,5
Teacher	3	4,8
Student	2	3,2
Worker	6	9,6
Fisherman	3	4,8
Housekeeper	8	12,9
Military	2	3,2
Retired	8	12,9
Total	**62**	**100**

Farmers were the most represented with 24.4%.

REASONS FOR CONSULTATION

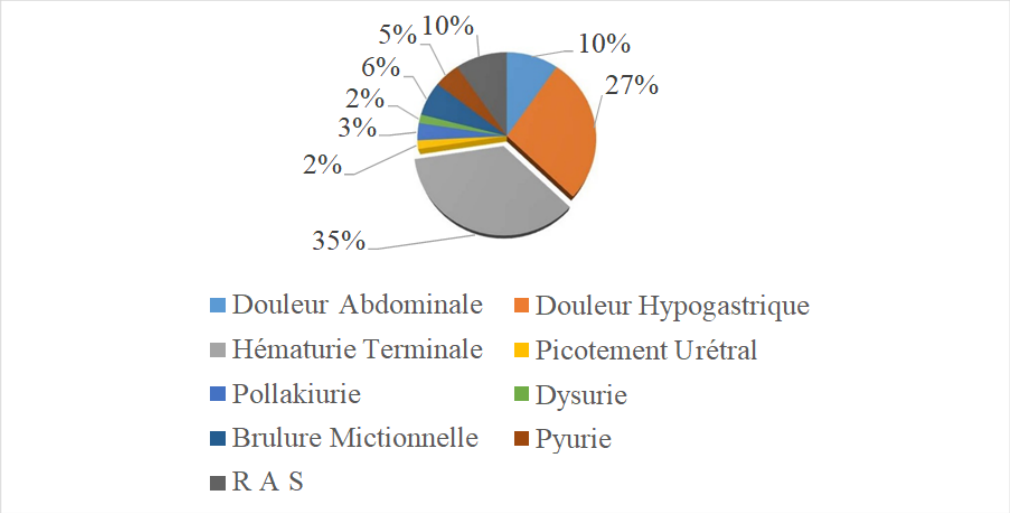

Figure 3: Breakdown of patients according to symptoms or reasons for consultation

Patients with end-stage haematuria were the most common, at 35.5%, followed by hypogastric pain, at 27%.

Table 2: Distribution according to secondary complications

Secondary Complications	Workforce	%
Recurrent total haematuria due to gravelling	19	30,6
Chronic cystitis	12	19,4
Patients with no complications	31	50
Total	**62**	**100**

Patients with recurrent total haematuria due to gravelling were the most numerous (50%).

2-14-LATE COMPLICATIONS

Table 3: Breakdown by late complications

Late complications	Workforce	%
Renal insufficiency	18	29
Ureterohydronephrosis	15	24,1
Ureteral calcification	14	22,5
Pyelonephritis	2	3,2
Anuria	1	1,6
Patients with no complications	12	19,3
Total	**62**	**100**

Patients with renal failure were the most represented, with 18 cases (29%).

2-15-BILHARZIA-CANCER

Table 4: Breakdown of patients in association with cancer

Organs	Workforce	%
Bladder	50	80,6
Prostate	6	6,9
Kidneys	3	4,8
Colon	3	4,8
Total	**62**	**100**

The association between bilharziasis and cancer was observed in the bladder in 50 cases (80.6%), the prostate in 6 cases (9.6%), the kidneys in 3 cases (4.8%) and the colon in 3 cases (4.8%).

Analytical study:

Table 5: Distribution of patients by year of diagnosis and primary complications

Year of diagnosis	Primary complications		Total
	Acute cystitis	Total haematuria	
2018	14	2	16
2019	10	5	15
2020	16	15	31
Total	40	22	62
Chi-2= 5.977 ddl=2 X^2seuil =5.99			

We found no statistically significant relationship between year of diagnosis and primary complications (P=0.05).

Table 6: Distribution of patients by year of diagnosis and secondary complications

Secondary complications	Year of diagnosis			Total
	2019	2020	2021	
Chronic cystitis	3	4	5	12
CLEAR	13	7	11	31
Bladder tumour	0	4	15	19
Total	16	15	31	62
Chi-2= 13.214 ddl=4 X^2seuil =9.49				

We found a statistically significant relationship between year of diagnosis and secondary complications (P=0.010).

Table 7: Distribution of patients by year of diagnosis and late complications

Year of diagnosis	Year of diagnosis			Total
	2019	2020	2021	
Chronic renal failure	0	3	15	18
CLEAR	16	12	16	44
Total	16	15	31	62
Chi-2= 12.776 ddl=2 X^2seuil =5.99				

We found a statistically significant relationship between year of diagnosis and late complications (P=0.002).

Table 8: Breakdown of patients by year of diagnosis and organs

Organs	Year of diagnosis			Total
	2019	2020	2021	
Bladder	19	11	20	50
Prostate	3	2	1	6
Kidney	3	0	0	3
Colon	2	1	0	3
Total	27	14	21	62
Chi-2= 23.046 ddl=6 X^2seuil =12.59				

We found a statistically significant relationship between the year of diagnosis and the organ affected (P=0.001).

IV. COMMENTS AND DISCUSSION

1) Materials and Methods

This was a cross-sectional, descriptive study conducted in the Markala reference health centre on cases of urinary bilharziasis diagnosed and treated on the basis of paraclinical investigations over a 29-month period from January 2019 to June 2021.

The aim of this study was to clarify the consequences of bilharziasis and to investigate the epidemiological and clinical aspects of the various cases in the Markala health district.

The cross-sectional and descriptive nature of the study constituted a bias due to the difficulty of using the reports and the unavailability of certain specific examinations to support the diagnosis.

2) Epidemiological data

a) Frequency per year

Of the 62 cases of urinary bilharziasis included in our study, 16 were diagnosed in 2019, i.e. 25.8%, 15 in 2020, i.e. 24.2%, and 31 in 2021, i.e. 50%.

This increase in incidence could be explained by the availability of certain specific examinations to confirm the diagnosis, in particular U.I.V, A.S.P, cystoscopy and Uroscanner, which have been available at Ségou hospital since January 2020; however, ultrasound and ECBU have been part of the other routine examinations available since the start of the study.

b) Age

The mean age of our patients was 28 years, with extremes ranging from 04 to 80 years. The 5-20 and 61-80 age groups were the most represented, with 33.9% and 22.6% respectively.

Studies on bilharzia pathology report an age of onset that is well below that of the disease itself lower than ours.

Patients in the Nayama series in Niger had a mean age of 26 years [17] (P<0.05). The results obtained by Touré [1] were similar, with a mean age of 27 years: the youngest patients were aged 04 years and the oldest 75 years (P<0.05).

This is due to the size of our sample. Bilharzia hampers the socio-economic development of infected areas, as it affects the most active section of the general population, particularly young people.

c) Gender

In our series, 48 cases were male and 14 female, giving a sex ratio of 3.42.

The predominance of Schistosomiasis in men has been reported by many authors; Minta and Coulibaly found 62.5% and 95.6% respectively in Mali in 2005 and 2011 [2, 17] (P>0.05). This could be due to the different activities carried out by men in swampy areas or to the anatomy of the male genital organs, particularly the importance of its vascularisation between the spermatic vein and the peri-ureteral venous plexuses.

However, the predominance of females was reported by Touré, who found a sex ratio of 1.12 (114 females/101 males) in 2000 [1].

In our series, the frequency of male patients was 77.4%.

d) Origin

We found that bilharziasis is unevenly distributed across Mali. Most of our patients come from the district of Markala (43.5%), followed by Siribala (8.1%), Dougabougou (6.5%) and Dioro (6.5%). This can be explained by the fact that the health districts of Markala, Siribala, Dougabougou and Dioro, along with Bamako and Mopti, are among the areas of high transmission of bilharziasis in Mali [23]. This result differs from that of Diallo [10], where the Kayes region was the most affected.

e) Ethnicity

The Bambara ethnic group was the most affected with 43.5%, followed by the Peulhs with 19.4%, and the Malinkés and Bozos with the same percentage, i.e. 8.1%. The same order was observed in the Logmo series [18], but not in the Diallo series [24]. This could be due to market gardening and fishing activities that bring them into permanent contact with water ($P<0.05$).

f) Frequency by symptoms or reasons for consultation

All patients, without exception, had stayed in a bilharzia-endemic zone, i.e. 100% of cases. Macroscopic haematuria increased with the ovarian load of *S. haematobium*. It varied from 35.5%. The rate of macroscopic haematuria was comparable at 63.5% in 2005 in Ségou [23].

The urological history mentioned was haematuria (35% of cases), followed by pollakiuria (3%) and dysuria (2%). Kondé H [15] reported 94.11% haematuria.

Although haematuria is usually absent in the sequellar phase of urinary bilharziasis, it is the main sign of active urinary bilharziasis and remains engraved in patients' memories.

During our study phase, 35% of our patients had a history of urinary bilharziasis (notion of terminal haematuria in childhood), including 25 cases not treated medically (40.3%).

This result is lower than those of Tangara S [23], Dembélé A [16] and Sow M.A [28] who found 80%, 75.5% and 78.1% respectively. The medical history mentioned was arterial hypertension (25.2%) and diabetes (34%).

This figure is higher than that of Kondé H, who found 14.70% of arterial hypertension [26].

The most frequent reason for consultation was hypogastric pain, with 17 cases (27%), followed by abdominal pain (10%), burning miction (6%) and pollakiuria (3%).

Abdominal and hypogastric pain decreased with increasing *S.haematobium* ovarian load. It was 9.7%. The rate of abdominal pain was less than 57.1% in 2011 in Koulikoro [8].

Drabo and Kondé H reported 90% and 73.52% respectively of lumbar pain [7, 26]. In fact, patients consult health facilities when their symptoms become unbearable.

g)-Paraclinical aspects

Diagnosis of urinary bilharziasis in its sequellar phase relies mainly on medical imaging, as the clinical picture is relatively poor.

The ECBU performed in all our patients was sterile due to antibiotic use. The presence of germs was reported in 48 patients (77.4%).

Escherichia. Coli was frequently found at 55%, Staphylococcus aureus at 11.1%, Klebsiella pneumoniae at 12.2%, Streptococcus pneumoniae at 10.2% and schistosomiasis eggs.

- These same germs were identified by H.A.S [14].
- CBC: showed the presence of hyper leukocytosis and hyper eosinophilia in our patients.
- All our patients had an ultrasound scan: of these, fifty (50) had a bladder tumour identified in the ultrasound report, i.e. 80.6%.

Ureteral and prostatic calcifications were found in 22.5% and 9.6% of cases respectively. There were no cases of seminal vesicle calcifications.

In the literature, the reported figures vary from 1.3% to 60% [22-26]. In our study, prostatic calcification was present in 6 cases (9.6%), whereas it accounted for 7.1% of cases in other series. It should be remembered that the value of ultrasound in the search for prostatic calcifications is controversial.

In particular, a certain geographical coincidence has been established between bladder tumours and urinary bilharziasis in certain highly endemic areas of Africa and the Middle East, and it is thought that the malignant transformation was triggered by prolonged irritation of the epithelium lining the bladder by the passage and trapping of ova [20, 21]. In our series, the histological type most frequently encountered was squamous cell carcinoma. The uroscanner was a valuable aid in assessing any possible impact on the upper urinary tract (ureteral obstruction by the tumour; search for a concomitant upper tract tumour, assessment of locoregional and distant extension of the tumour: assesses invasion of peri-vesical fat and neighbouring organs, allows the search for metastatic adenopathies or metastases.

Some of our patients presented with anuria (1%), unilateral or bilateral ureterohydronephrosis (24.1%), chronic renal failure (29%) and bladder bilharzia (30.6%); all these complications have been observed in certain studies carried out in other countries [21 23].

CONCLUSION

Bilharzia is a real public health problem, ranking second among parasitic diseases in Mali. It is a real brake on economic development because it affects the most active age group in the population.

The paradox of bilharzia is that irrigated areas, developed to ensure food self- sufficiency, and hydroelectric dams contribute to the spread of bilharzia infestation.

While in the active phase it manifests itself as capricious haematuria, in its sequellar phase it manifests itself as a pain syndrome (renal colic, low back pain) and micturition disorders due to the obstruction of the excretory pathway, which progressively kills the kidneys in the absence of diligent and adequate management.

REFERENCES

1. Toure, A., Traore, C. B., Sacko, M., Kamate, B., & Bayo, S. (2000). Tissue schistosomiasis in Mali: 215 cases. *Mali Médical*, *15*(3), 29-31.
2. Minta, D. K. (2005). Bilharzia morbidity in the Bamako hospital environment of the Hôpital du Point G. Mali. *Mali Médical*, *20*(4), 34-38.
3. Diallo, M. (2003). Place de la bilharziose dans les tumeurs de la vessie au Service d'urologie de L'Hôpital Gabriel Touré au Mali Thèse de médecine, Bamako, 03-M-21.
4. Keïta, A. D., Sacko, M., Coulibaly, Y. I., Coulibaly, S. Y., Landoure, A., Touré, M., ... & Fenweck, A. (2009). Urologic tumour imaging in an area of endemic bilharziasis in Mali. *Journal africain du cancer/African Journal of Cancer*, *1*, 135-140.
5. Traoré, M., Landouré, A., Diarra, A., Kanté, B., Sacko, M., Coulibaly, G., Sangho, A., & Simaga, Y. (2007). Ecoclimatic diversity and epidemiology of schistosomiasis in Mali, implications for a control programme. *Mali Médical*, *22*(3), 22-26.
6. Tchuenté, L. A. T., Shaw, D. J., Pona, L., Cioli, D., & Vercruysse, J. (2004). Efficacy of praziquantel against Schistosoma haematobium infection in children. *American Journal of Tropical Medicine and Hygiene*, *71*(6), 778-782.
7. Drabo, B. (1987). Place of bilharzian lesions in the pathology of the excretory tract and surgery of the bilharzian ureter in the urology department of the Point G hospital. A propos de 20 cas. Thèse Méd, Bamako. M11.
8. Dabo, A., Sissoko, M., Audibert, M., Diakité, M., Diarra, A., Diallo, M., ... & Doumbo, O. (2005). Impact de la chimiothérapie de masse au praziquantel sur l'infection due à S. haematobium et S. mansoni à l'office du Niger, Mali. *Mali Médical*, *20*(4), 29-33.
9. Landouré, A., Traore, M. S., Sacko, M., & Coulibaly, G. (2006). Knowledge, attitudes and practices of the population in relation to schistosomiasis in the Office du Niger. Mali Médical 2006, Tome XXI^{ème} , 1, 30-37.
10. Traoré, M. (1994). A study of the epidemiology of schistosomiasis in Mali towards a rationally based national control programme. PHD thesis university of London.
11. Kuper, H. (2000). Trichopoulos infections D. as a major cause of cancer in humans. *Stagiaire J Med*, 248, 171-183.
12. Kuetche, L. P. (2008). Bladder pathology and anatomopathology in hospitals and health centres du Mali, PhD thesis, FMOS, p 43.
13. Chai, M., Tu, Q., Lu, M., & Yang, Y. J. (2014). Esterification pretreatment of free fatty acid in biodiesel production, from laboratory to industry. *Fuel processing technology*, *125*, 106-113.
14. Capron, A., Capron, M., & Riveau, G. (2002). Vaccine development against schistosomiasis from concepts to clinical trials. *British Medical Bulletin*, *62*(1), 139-148.
15. Gryseels, B. (2006). Human schistosomiasis. *Lancet*, *368*(9541), 1106-1118.
16. Ferguson, A. R. (1911). Associated bilharziasis and primary malignant disease of the urinary bladder with observations on a series of forty cases. *J Pathol Bacteriol*, *16*(1), 76-94.
17. David, A., Timothy, W., Cox, M., & John, D. (2003). Adult's worms of S.mansoni The shorter male encloses the female in its gynaecophoric canal (Oxford Texbook of medicine, 1, P. 831.
18. Tangara, M. (2002). Surgical aspects of the sequelae of bilharziasis Thesis of Medicine Bamako. O2-M-60.
19. Khoury, S. (1985). Urology, infectious and parasitic pathology MASSON.
20. Doherty, J. F. (1996). Katayama fever: an acute manifestation of schistosomiasis. *Bmj*, *313*(7064), 1071-1072.
21. Roca, C. (2002). Comparative, clinico-epidemiologic study of *Schistosoma mansoni* infections in travellers and immigrants in Spain. *Eur J Clin Microbiol Infect Dis*, *21*(3), 219-223.
22. De Jesus, A. R. (2002). Clinical and immunologic evaluation of 31 patients with acute *schistosomiasis mansoni*. *J Infect Dis*, *185*(1), 98-105.
23. Jaureguiberry, S., Ansart, S., Perez, L., Danis, M., Bricaire, F., & Caumes, E. (2007). Acute neuroschistosomiasis: two cases associated with cerebral vasculitis. *American Journal of Tropical Medicine and Hygiene*, *76*(5), 964-966.
24. Jauréguiberry, S. (2008). Neurological involvement during Katayama syndrome. *Lancet Infect Dis*, *8*(1), 9-10.
25. Visser, L. G., Polderman, A. M., & Stuiver, P. C. (1995). Outbreak of schistosomiasis among travelers returning from Mali, West Africa. *Clinical*

infectious diseases, *20*(2), 280-285.
26. Tzinger, J. (2000). Oral artemether for prevention of Schistosoma mansoni infection: randomized controlled trial. *Lancet*, 355(9212), 1320-1325.
27. Nayama, M. (2007). *S. haematobium* urogenital bilharziasis and infertility in Niger. Prospective study of 109 female patients. *Mali Médical, 22*(3), 15-21.
28. Coulibaly, Y. (2011). Urinary bilharziasis and lithogenesis: Study of 23 cases at the Gabriel Toure University Hospital. *Mali Médical, 26*(1), 26-28.
29. Logmo, K. (2004). The role of bilharziasis in bladder cancers in the anatomopathology department of the INRSP, 78 cases. Thèse de medicine, P. 63 n° 04. M-97.
30. Alex Gaüzère. Updated on 20/12. Schistosomiasis or bilharziasis News 2019 Professor Pierre Aubry, Docteur Bernard- http://www.medecinetropicale.com

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