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Original Article

Emergence of Urogenital Schistosomiasis Cases in Southwest Libya: Evaluation and Management

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ABSTRACT:

Background: Schistosomiasis is an infection caused by a parasitic worm that lives in fresh water throughout Africa. In many tropical and subtropical regions, including Libya, urogenital schistosomiasis is regarded as one of the neglected tropical illnesses. In Libya, the first known instance of schistosomiasis was in 1925. Since 2003, the prevalence of focally endemic *Schistosoma haematobium* and *Schistosoma mansoni* in Libya has been estimated at 5%. **Aim:** The primary goal of this study is to explore the emergence of bilharzial cystitis cases in southwest Libya and to evaluate current diagnostic and management approaches. **Material and methods**: 28 patients with belharzial cystitis were diagnosed at the Al Rahma Poly Clinic in Sabha City, Libya between February 2020 and August 2024, and were analyzed. Patient demographics, clinical presentations, laboratory findings, and treatment outcomes were reviewed. **Results:** the ages of the 28 patients in this study ranged from 9 to 65 years old (mean: 18.96 ±10.64 years). The majority were Libyan (82.14%), while 17.86% were non-Libyan (from Niger and Chad). Following treatment with a single dose of praziquantel (40 mg/kg), only one patient (3.5%) exhibited persistent hematuria, and two (7.1%) had dysuria at one-month follow-up. Additionally, 3.5% had persistent bilharzial eggs in urine, 39.2% had persistent RBCs, and 21.4% had pus cells. Urogenital schistosomiasis remains hypoendemic in several Libyan regions. **Conclusion:** our data showed that both surveillance and management programs are necessary to detect and handle these occurrences. This can easily be achieved by focusing on snail control, praziquantel chemotherapy, public health education, and access to clean water. Schistosomiasis should be considered as a differential diagnosis for hematuria in endemic regions.

Keywords: Hematuria, *Schistosoma haematobium*, Bilharzial Cystitis, Urogenital Schistosomiasis, praziquantel.

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INTRODUCTION:

Schistosomiasis, also known as bilharzia, is a parasitic disease caused by trematodes of the genus *Schistosoma*. The three primary species affecting humans are *Schistosoma japonicum*, *Schistosoma haematobium*, and *Schistosoma mansoni*, leading to either intestinal or urogenital schistosomiasis [1]. *S. haematobium* is the causative agent of urogenital schistosomiasis (UGS), characterized by hematuria (blood in urine). Chronic infection is a major risk factor for bladder cancer and can contribute to infertility [2]. The disease is endemic in parts of the Middle East and Africa. However, *Schistosomes* have a complicated life cycle that includes both human and snail hosts. In endemic places, contact with contaminated water perpetuates the spread, making control and eradication challenging [3].In Libya, schistosomiasis was first documented in 1925 in the Ghat district, but later in 1932 another case was reported from Wadi Shati in the Fezzan region in the Southern part of Libya [4]. Since 2003, the prevalence of focally endemic *S. haematobium* and *S. mansoni* in Libya has been estimated to be 5%. Snail intermediate hosts have a patchy distribution because the country's topography, which is dominated by large stretches of arid, sandy regions with high saline water, does not allow for their extensive colonization [5]. The snail intermediate hosts for *S. haematobium* that have been detected in Libya are *Bulinus truncatus* and *Bulinus globosus*, where they were first identified in the Ghat district in 1957. Currently, *B. truncatus* is known to be endemic in Alfogaha districts. At the Taourga oasis, *S. mansoni* was discovered as a locally endemic organism that is spread by *Biomphalaria alexandrina* snails [6]. Additionally, in 1993, Baccush and his group documented the prevalence of *S. Mansouni* in Tauorga town. Moreover, among approximately 21,000 people in Taourga Oasis, the prevalence among school-age children reached 39.8% in 1999. The prevalence in that community has decreased to 3% as of 2007, and all infections have been identified as *S. mansoni* [7]. Although schistosomiasis is a well-known disease worldwide, the information regarding this infection in Libya generally and in Sebha particularly is not well documented. There was one study conducted in 2007 that described the incidence of *S. haematobium* among Libyan patients, and another study was conducted in 2018 that revealed the presence of *S. haematobium* in a 13-year-old Libyan male Child admitted to Sebha Medical Center, which is regarded as the biggest clinical center in this city [8]. Saadawi and his research group have also reported a new sporadic case of Urinary schistosomiasis in patient from Ubari city which is

located in South-West Libya [9].The control measures, which included screening and treatment of the entire population with directed praziquantel treatment, mechanical and biological snail control, and education, were started in the late 1990s. In addition to biological control of snails to prevent the need for chemical molluscicides, mass treatment was organized to continue annually until eradication was accomplished [10]. Moreover, an estimated 800 million people are at risk of infection; 230 million are thought to be infected [11]. Therefore, the emergence of bilharzial cystitis in southwest Libya and evaluating current diagnostic tools and management approaches used to treat such conditions was the primary objective of this study.

MATERIAL AND METHODS:

In this research, we retrospectively studied 28 patients who presented with hematuria and Dysuria to Al Rahma clinic in Sabha city between February 2020 and August 2024. These 28 patients were diagnosed as bilharzial cystitis.

Clinical Evaluation at presentation: all patients underwent:

- Medical history assessment, including hematuria, dysuria, kidney or abdominal pain, and history of exposure to infested water.
- Laboratory investigations, including complete blood count, renal function tests, and urine analysis for *schistosome* eggs and red blood cells.
- Histopathological examination was performed on 10 patients, and the presence of bilharzial eggs in bladder tissue (cystoscopic biopsies) was confirmed.

Treatment and Follow-Up:

- All patients received a single dose of praziquantel (40 mg/kg)
- Ten patients underwent cystoscopy and transurethral resection of bladder tumors (TURBT).
- Follow-up after one month includes clinical assessment, urine analysis, and abdominal/pelvic sonography was done for those patients with bladder masses.

Statistical Analysis: Data analysis was conducted using IBM SPSS Statistics v20.0 (Armonk, NY: IBM Corp). Descriptive statistics were expressed as mean ±standard deviation (SD) for continuous

variables and frequency (%) for categorical variables. The Shapiro-Wilk test was used to verify normality, and chi-square tests assessed differences between pre- and post-treatment variables. Statistical significance was set at $p < 0.05$.

RESULTS:

In this study the age for all included patients was ranged from 9-65 years old with mean:18.96 ± 10.64 years. This study showed that 25 (89.28%) was male and 3 (10.72%) were female patients **(Fig. 1).** 23 patients (82.14%) were Libyan and 5 (17.86%) were non-Libyan, 3 from Niger and 2 from Chad, more details shown in Table 1.

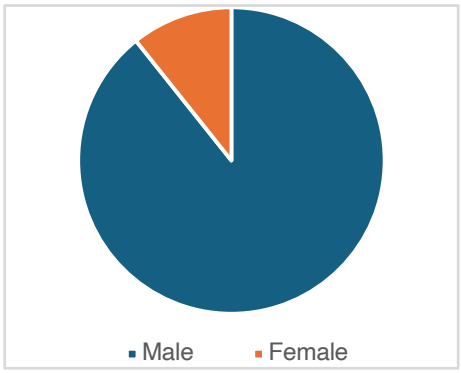

Figure 1: Frequency of bilharzial cystitis among 28 patients. Data shows 89.28% of patients were male, while the rest were female (10.72%)

Table 1: Demographic data of studied patients

Age	N.	%
Mean ± SD	18.96 ± 10.64	
Median (Minimum - Maximum)	16 (9-65)	
Sex		
Male	25	89.28%
Female	3	10.72%
Nationality		
Libyan	23	82.14%
Non-Libyan	5	17.86%

Data presented as Mean ±SD or n (%)

Clinical Presentation Before Treatment:

- All patients (100%) presented with hematuria.
- Dysuria was reported in 18 patients (64.28%).
- Flank pain was noted in 1 patient (3.57%). All data are presented in Figure. 2 and Table 2

Table 2: Clinical Presentation of studied cases before and after Follow-up after 1 months

	Baseline		Follow-up after 1 months		Test	P value
Clinical Presentation	N.	%	N.	%		
Dysuria	18	64.28 %	2	7.142	20.8	<0.001
Hematuria	28	100	1	3.571429	52.14	<0.001
Loin Pain	1	3.57%	0	0	1.018	0.31

Data presented as n (%), X^2: chi-square test

At one-month follow-up:

- Hematuria persisted in 1 patient (3.5%).
- Dysuria persisted in 2 patients (7.1%).

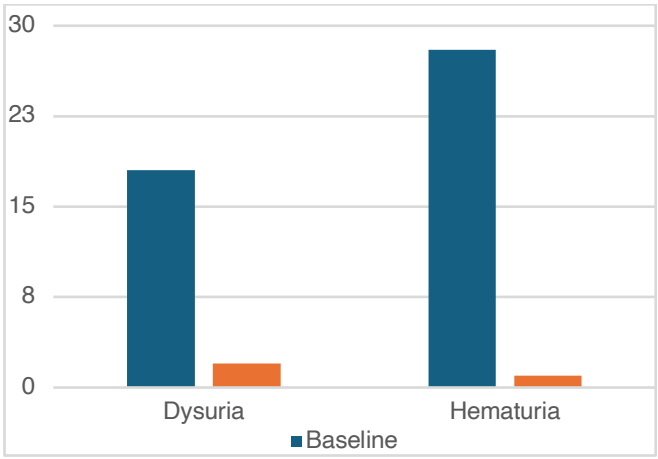

Figure 2: Clinical Presentation of studied cases before and after Follow-up after 1 month

Urinalysis Findings

After treatment: Only one patient (3.5%) had persistent bilharzial eggs in urine, 11 (39.2 %) patients had persistent RBCs, and 6 (21.4%) patients had pus cells one month after treatment Table 3 and Figure. 3.

Table 3: Urinalysis of studied cases before and after Follow-up after 1 month

Parameter	Baseline (n, %)	Follow-up (n, %)	p-value
Pus cells	15 (53.57%)	6 (21.43%)	12
RBCs	28 (100%)	11 (39.29%)	<0.001

Bilharzial eggs	26 (92.86%)	1 (3.57%)	<0.001
Proteinuria	14 (50%)	0 (0%)	<0.001

Data presented as n (%), X^2: chi-square test

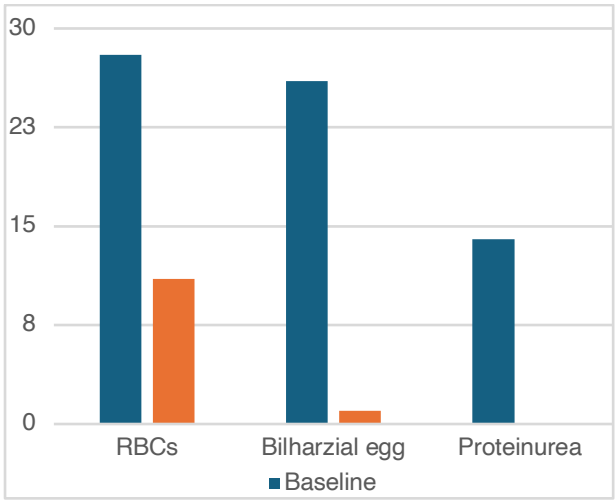

Figure 3: Urinalysis of studied cases before and after Follow-up after 1 month

Abdominal and Pelvic Ultrasound Findings:

The ultrasound of the abdomen and pelvis was done for all patients in order to rule out any pathological abnormality. Our study showed that before treatment, unilateral hydronephrosis was detected in 2 patients, and Bilateral hydronephrosis was found in one patient. The ultrasound has also revealed a bladder mass in 10 patients. After treatment, the improvement was observed in most cases except the patient with Bilateral hydronephrosis Table 4.

Table 4: Abdomen and Pelvis Ultrasound of studied cases before and after Follow-up after 1 month.

Parameter	Baseline (n, %)	Follow-up (n, %)	p-value
Unilateral hydronephrosis	2 (7.14%)	0 (0%)	0.15
Bilateral hydronephrosis	1 (3.57%)	1 (3.57%)	1.00
Bladder mass	10 (35.7%)	0 (0%)	<0.001

Data presented as n (%), X^2: chi-square test:
This table shows that there is a highly significant difference between before and after, Follow-up after 1 month regarding the bladder mass.

Treatment Outcomes:

- All patients (100%) received praziquantel.
- 10 patients (35.71%) underwent cystoscopy and TURBT.

Table 5: Treatment of studied cases

Treatment	Number(N)	%
Cystoscoopy and Turbt	10	35.71
Prazequental	28	100

Data presented as N and (%)

DISCUSSION:

In many regions of the world, schistosomiasis is still a public health concern. In Africa, for example, 92% of the population needs preventive medication for the disease [12]. The primary control method used in endemic areas for schistosomiasis is the use of the anti-helminth medication Praziquantel. Iran, Lebanon, Morocco, and Tunisia are among the several nations in the region that have eradicated the disease. Nonetheless, recent reports have indicated minimal endemicity in Saudi Arabia, Egypt, Iraq, Jordan, Libya, Oman, and Syria [13]. According to data recorded from 2003, the prevalence of *S. haematobium* and *S. mansoni* in focal endemic areas of Libya was 5%. Libya began implementing a control program in 1990 that included health education, snail control, and the screening and treatment of the entire population with praziquantel chemotherapy. By 2007, the illness in the community had decreased to 3% [14]. This study revealed that twenty-three patients were working in an area at the Libyan-Chadian borders where there is lack of basic necessities of life and the water is infested. So, their infection with bilharzia was attributed to this infested area. The others have a history of traveling abroad to Chad and Niger. Reports and data on the general trends of schistosomiasis in Libya, however, are few and contradictory. Furthermore, according to the official WHO PCT databank, prophylactic praziquantel was not recommended in as of 2013 [15]. While hematuria and proteinuria are often linked to kidney infections, stones, malignancy, and glomerulonephritis, the urologists should be aware that other conditions like urogenital schistosomiasis, especially in regions where it's endemic, can be possible. However, the prevalence of this infection has decreased since 2013, and thereby, preventative chemotherapy has been discontinued [16]. Moreover, in the southwest of Libya, schistosomiasis has only been found in a few

oases and focus areas [14]. It has been reported that the treatment with the isoquinolinone drug, praziquantel, once every 1 or 2 years can decrease the morbidity rate, especially in endemic areas [17]. Our data revealed that A single dose of praziquantel (40 mg/kg) was enough to eradicate urogenital schistosomiasis, and is still considered the primary choice for treating schistosomiasis.

CONCLUSION:

Urogenital schistosomiasis is still hypoendemic in several parts of Libya. To identify and manage these cases, however, a surveillance system and control program are essential. This can be accomplished by controlling the snail intermediate host, eradicating the adult worms using Praziquantel chemotherapy, educating people about health issues to alter their behavior, and supplying clean and safe water. When making a differential diagnosis of kidney and bladder disorders, as well as hematuria, schistosomiasis should be kept in mind.

Recommendations

- Conduct national surveys to evaluate schistosomiasis control efforts.
- Ensure availability of praziquantel treatment across Libya.
- Educate healthcare providers on schistosomiasis diagnosis and management.

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