

An effective proposal plantherapy forthe treatment of schistosomiasisinTaiz Governorate

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Abstractالملخص

Background: Schistosomiasis is one of the most common diseases in Yemen, especially in Taiz, and it is a serious infection that causes many organic damages including cirrhosis of the liver, enlargement of the spleen, gastrointestinal bleeding and an increased risk of bladder cancer. There are several treatments for schistosomiasis in the initial stages through a specific dose and during a short period, and the most famous of the schistosomiasis drugs is praziquantel. According to the known treatment plan, praziquantel eliminates only adult schistosomiasis, but it is not effective in killing eggs and immature worms, and therefore the treatment of praziquantel is repeated after 4 -6 weeks to ensure complete eradication of the parasite, but with that there are many cases that have not been treated.

Methods: In this research, three methods were provided to treat schistosomiasis. The first method was given the first group according to the general protocol Praziquantel 40 mg per kilogram as a single dose, which is the most used method of treatment. As for the second method, Praziquantel was used twice a week at a dose of 40 mg / kg. While the third method proposed in the research, two drugs were proposed, namely the Praziquantel and the prednisone, and a protocol was placed for treatment, where the Praziquantel was prescribed at a dose of 40 mg / kg on the first day and was reduced to 20 mg / kg for 6 days. As for the treatment with prednisone, it was prescribed by 20 mg per day for a week, then it decreases to 10 mg / day for a week after that.

Results: The tests were conducted on a group of schistosomiasis patients, including 450 patients. The patient group was divided into 3 groups in each group of 150 patients. The three methods were applied to the three groups. The results of the first

group were the number of healing cases 40 cases from 150 patients, while the healing cases of the second group were 90 cases from 150 patients. Finally, the results of the third group, which is the proposed method is better than the results of the first group and the second group, where healing cases were 100 percent.

Conclusion: Through the results, the third group proposed in the research proved that it is more effective and healing rate of up to 100 percent .

Keywords: schistosomiasisPraziquantel, .

1. Introduction

Schistosomiasis, also known as Katayama fever and spiral fever, is caused by parasitic flatworms called schistosomiasis. Schistosomiasis affects the intestines and urinary system and lives in the blood vessels, so it can affect other organs in the body [1]. Schistosomiasis is not usually directly fatal, but we can say that it is a chronic disease that seriously damages internal organs and may lead to impaired growth and cognitive disorder in children [2,3]. According to the World Health Organization, infection begins when a person directly contact with fresh water, where specific types of water snails are carried by the worm [4]. Parasites enter the body when swimming, washing, or rowing in contaminated water, and the infection may also come from drinking water or eating washed food with unspecified water. The infective form of the worm is known as the cercaria. The cercaria emigrates from snails, enter a person's skin when they are in water, and develop into adult worms in human organism . Depending on the type of worm, schistosomiasis can affect intestine, liver, urinary tract, lung, spinal cord and a brain [5, 6, 7] . infection

begins when worm eggs enter fresh water from the urine and faeces of previously infected people. The eggs hatch in the water, releasing tiny larvae, and the larvae multiply inside the water snails [8]. After the water snails infect,

the worm cercariae are released. The causative agent penetrates the human skin, enters the bloodstream, travels through blood vessels to the lungs and liver, and then moves to the veins around the intestines and bladder. The worms mature after a few weeks, mate and begin producing eggs. These eggs pass through the walls of the bladder, intestine, or both, and eventually leave the body through urine or stool as seen in figure 1. At this point, the cycle begins again [9].

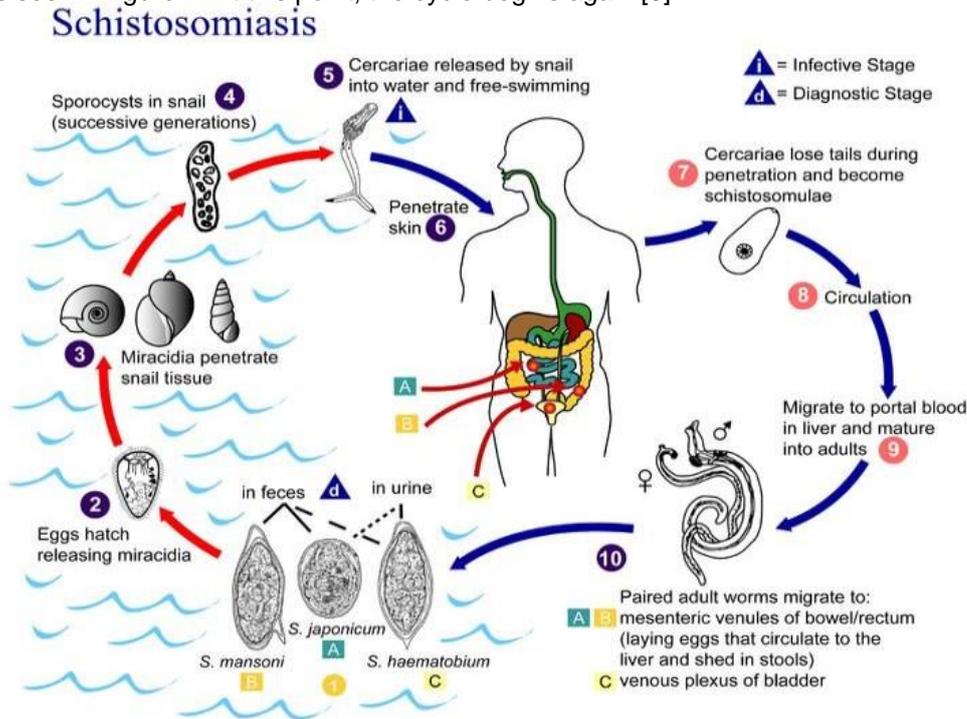


Figure 1. Schistosomiasis Life Cycle

Schistosomiasis infected approximately 236.6 million people worldwide in 2019 [11]. according to the Centers for Disease Control and Prevention (CDC), and mostly found in Africa, including Egypt and the Nile Valleys, south Asia, south America, and in Middle east including Yemen. The effect of infection depends on the type of worm and the stage of infection. infection occurs as a result of the body's immune response to worm eggs [12] and disease may be have acute phase: rash, fever, headache, muscle pain, and difficulties in breathing or chronic abdominal pain,

jaundice, fatigue, decrease appetite and complications including bloody vomit, bloody stool, liver fibrosis, bladder cancer and anemia. There is no vaccine available for schistosomiasis [13] but treatment can reduce the effect of the infection. Praziquantel are usually effective if the patient has not complications, and it may help even in the advanced stage [14], but it does not prevent the return of the infection. People who live in endemic areas can take one oral dose of praziquantel. To reduce the chance of infection and complications [15], they may need this treatment annually for several years.

2. Methodology

In this section we will present an effective method for treating schistosomiasis by testing the proposed method on 150 patients where the first dose of praziquantel 40 mg/kg was given on the first day and then followed by 20 mg/kg for 6 days with prednisone 20 mg daily for a week, followed by a half dose of 10 mg for a week after that compared with the methods used and the results showed that the proposed method was more effective and that the treatment rate was 100 percent.

The proposed method can be presented in the following steps: data collection for patients, medical examinations, and treatment plan.

2.1 Data collection

The research was based on a group of 450 patients who were divided into three groups, each group consisted of 150 patients and their weights ranged from 37 to 81 kg from different places in the city of Taiz (Al-Dhabab, Al-Akrud, Jabal Habashi, Al-Nashama, Al-Turbah, Kadas, Bani Yusef).

2.2 Medical examinations

Each patient was examined for evidence of schistosomiasis either in stool, urine or blood test, and an abdominal ultrasound was made for all patients.

2.2.1 Clinical examination

On the clinical examination for 450 patients, all of them complained of different symptoms, including: general fatigue, decrease of appetite in all patients, pain in the upper right quadrant of the abdomen in 320 patients, yellowish discoloration of eyes in 250 patients, pallor in 300 patients, dark urine in 265 patients, blood in the urine in 50 patients, and blood in stool in 120 patients.

2.2.2 Blood investigations

During a blood test, it was found that all patients had antibodies to schistosomiasis IgG, which indicated infection. Anemia was in 350 patients. high eosinophilia in approximately in all diseases, and when examining the liver enzymes, 320 have elevated liver enzymes (G.P.T, G.O.T) and 310 patients have high serum bilirubin. Virus hepatitis A, B, and C were negative for all patients .

2.2.3 Abdominal ultrasound

After ultrasound for all diseases, it was found preportal fibrosis in 300 patients, fatty liver in 50 patients, splenomegaly in 270 patients, and hepatomegaly in 200 patients.

2.2.4 Urine examination

Through urine examination, ova and R.B.C parasite were found in 50 patients.

2.2.5 Examination of stool

In the stool examination, parasitic eggs and ova were found in 130 patients

2.3 Treatment

In the treatment phase, the schistosomiasis parasite must be eradicated by a specific anti-schistosomiasis drug mostly using Praziquantel 600. Most studies indicate the effectiveness of the treatment if one dose is taken or three doses with a difference of two weeks but it was noticeable in the patients for whom we applied this protocol of treatment that the benefit from treatment low when taking the praziquantel 600 for 40 mg per kg as single dose, even when the dose is repeated for three times with a difference of two weeks, the rate of recovery from it remains incomplete.

As indicated by this research that the patient groups were divided into three groups and a treatment plan was developed for each group. The first group was prescribed treatment according to the general protocol at 40 mg per kg of praziquantel as a single dose, while the second group was prescribed praziquantel treatment by repeating the dose twice for two weeks at a dose of 40 mg / kg, while the third group, which we suggested, includes giving the first dose 40 mg /kg of praziquantel on day 1, then 20 mg/kg for 6 consecutive days with prednisone 20 mg daily for 1 week, followed by 10 mg/day for 1 week thereafter.

3. Result

After giving all groups of patients the specific treatments for each group, the results were in the first group, where the symptoms of the

disease persisted in more than 110 patients after follow-up after two weeks and then after a month as seen in figure 2. As for the results in the second group, symptoms persisted in 60 patients after another month's follow-up (see figure 3). While the results in the third group, the symptoms completely disappeared in all patients upon follow-up after two weeks and then after a month as seen in figure 4.

Thus, it can be said that the cure rate of schistosomiasis symptoms is very high if it is taken according to the treatment protocol of the third group in this research.

After comparing the results for the three groups, we find that the number of improvement cases for the second group is more than of cases for the first group, with a difference of fifty cases. When comparing the result of improvement cases from the treatment of the second group with the cases of the proposed third group, we find that the number of improved cases for the third group is more by a difference of sixty cases. It is clear from the results that the third group proposed to treat patients has better results by 100 percent as presented in figure 5.

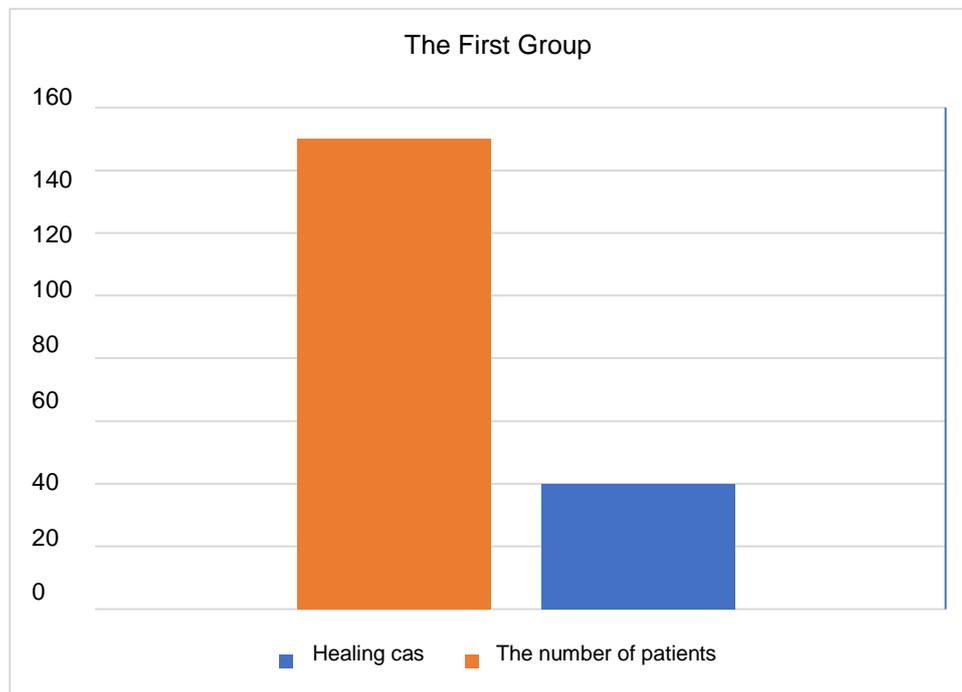


Figure 2. Results of using the treatment plan for the first group

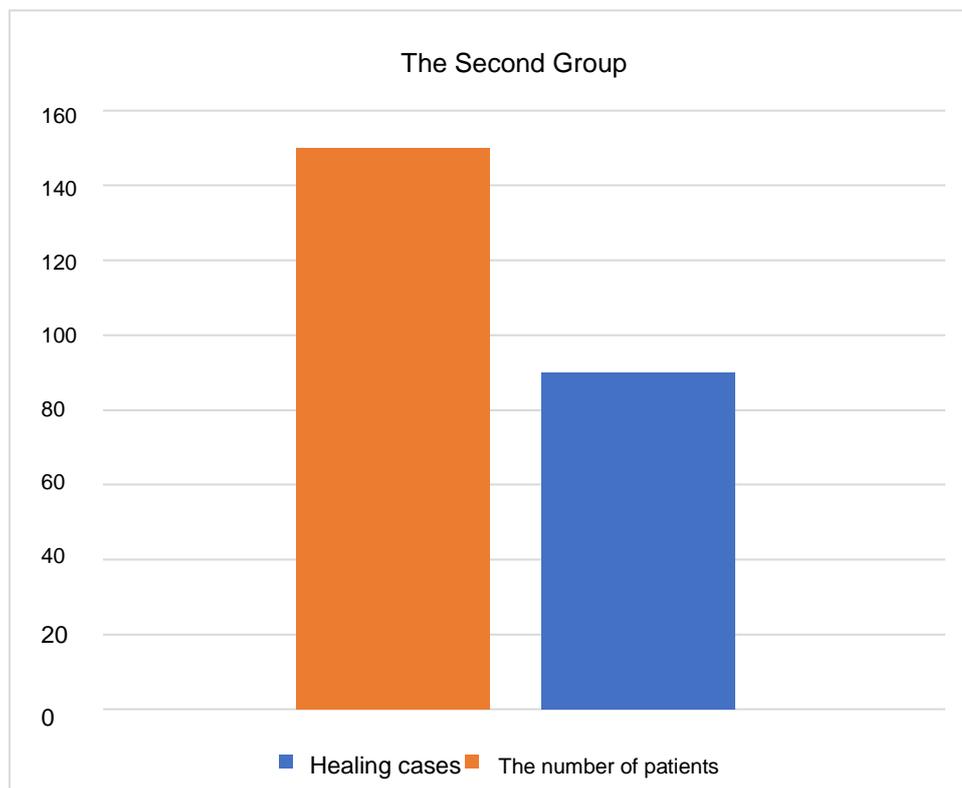


Figure 3. Results of using the treatment plan for the second group

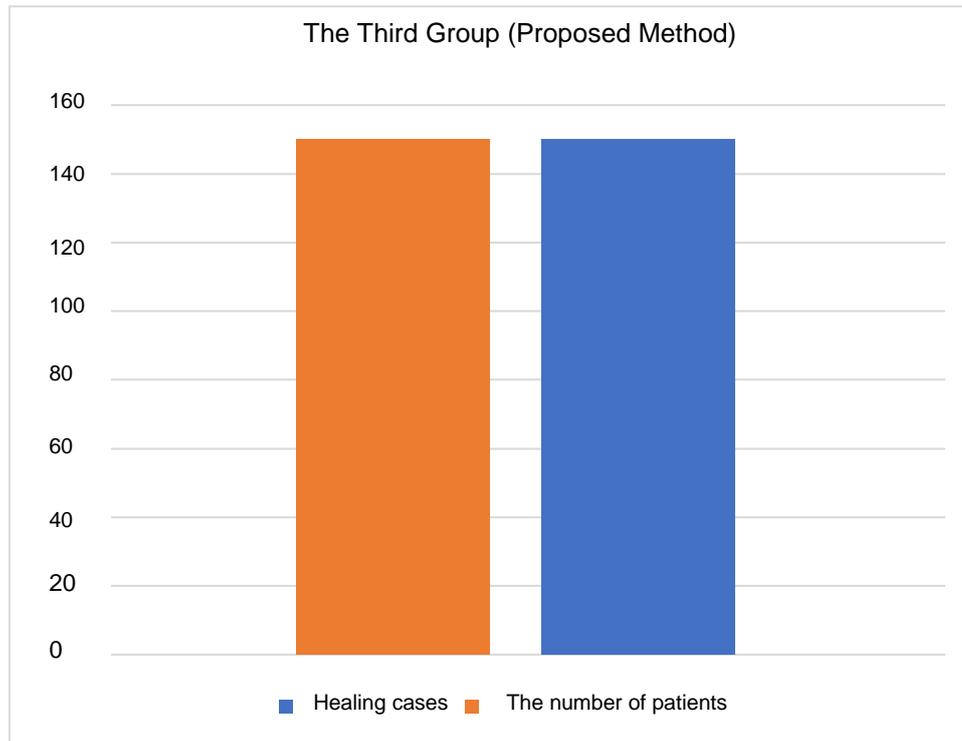


Figure 4. Results of using the proposed treatment plan for the third group

Figure 4. Results of using the proposed treatment plan for the third group

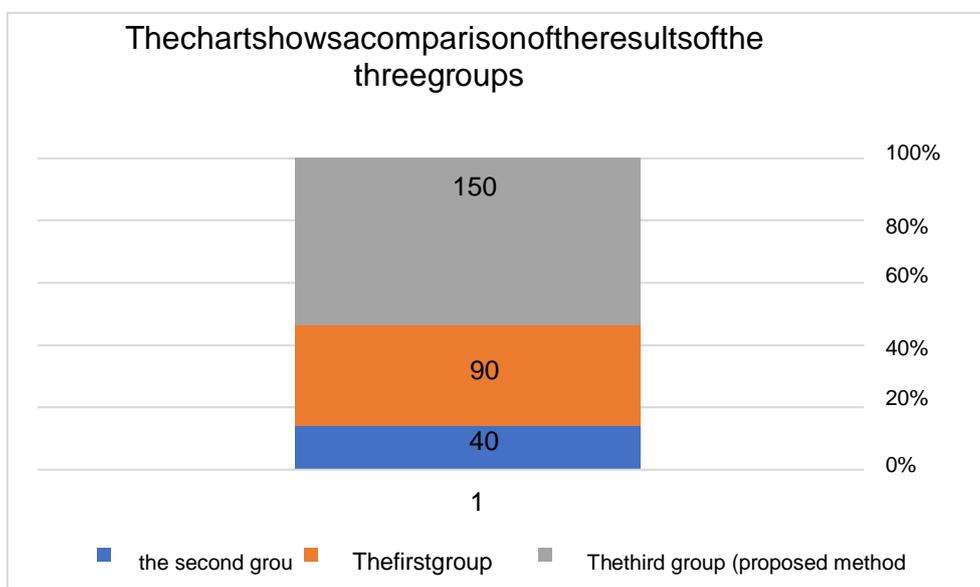


Figure 5. Results of comparing the three treatment groups for patients

4. Discussion

Treatment tests for schistosomiasis were performed on 450 patients and the group of patients was divided into three groups, each group 150

patients and each group was given a treatment plan. The first group was given according to the general protocol praziquantel 40 mg per kg as a single dose, which is the most used method of treatment [16] and the results were 40 cases out of 150 patients that were cured and this method of treatment was applied in Egypt through the comprehensive treatment program praziquantel. Before treatment, the prevalence of schistosomiasis in villages ranged from more than 30% to 10% to 20% and after using the treatment the prevalence of treatment decreased to less than 3% [17]. While the results of the second group were better than the results of the first group. The number of cured cases reached 90, due to the use of praziquantel twice a week at a dose of 40 mg / kg [18]. It was suggested to use praziquantel with prednisone treatment on mice [19] and it was not applied to human patients. In this research, praziquantel was suggested with prednisone treatment with a treatment protocol for the third group of patients where praziquantel was prescribed at a dose of 40 mg/kg on the first day and it was reduced to 20 mg/kg for 6 days. As for prednisone treatment, it was prescribed at 20 mg daily for a week, then it was reduced to 10 mg/day for a week after that. The treatment showed great effectiveness in treating patients, and the results of the third group were better than the first group. And the second, where the cure rate among patients was 100%.

5. Conclusion

This paper aims to find an effective treatment for patients with schistosomiasis, as tests of treatments were conducted on three groups.

Through the results, the third group proposed in the research proved to be more effective and the cure rate reached 100%.

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