

Schistosomiasis

Schistosomiasis is an important cause of disease in many parts of the world, most commonly in places with poor sanitation. School-age children who live in these areas are often most at risk because they tend to spend time swimming or bathing in water containing infectious cercariae.

Schistosomiasis is considered one of the Neglected Tropical Diseases (NTDs). The parasites that cause schistosomiasis. More than 200 million people are infected worldwide. In terms of impact this disease is second only to malaria as the most destructive parasitic disease. The parasite live in certain types of freshwater snails. The infectious form of the parasite, known as cercariae, emerge from the snail, hence contaminating water. When our skin comes in contact with contaminated water. Most human infections are caused by *Schistosoma mansoni*, *S. haematobium*, or *S. japonicum*.

Epidemiology & Risk Factors

Schistosomiasis affects almost 210 million people worldwide, and an estimated 12,000 to 200,000 people die from it a year. The disease is most commonly found in Africa, as well as Asia and South America. Around 700 million people, in more than 70 countries, live in areas where the disease is common. Schistosomiasis is second only to malaria, as a parasitic disease with the greatest economic impact.

Schistosoma mansoni distributed throughout Africa: There is risk of infection in freshwater in southern and sub-Saharan Africa—including the great lakes and rivers as well as smaller bodies of water.

Transmission also occurs in the Nile River valley in Sudan and Egypt.

South America: including Brazil, Suriname, Venezuela

S. haematobium Distributed throughout Africa: There is risk of infection in freshwater in southern and sub-Saharan Africa—including the great lakes and rivers Transmission also occurs in the Nile River valley in Egypt and Middle East.

S. japonicum found in Indonesia and parts of China and Southeast Asia

With humans being the definitive host. parasite eggs are released into the environment from infected individuals, hatching on contact with fresh water to release the free-swimming miracidium. Miracidia infect fresh-water snails by penetrating the snail's foot. producing thousands of new parasites, known as cercariae, which are the larvae capable of infecting mammals. Penetration of the human skin occurs after the cercaria have attached to and explored the skin.

Clinical features

Incubation period: may be weeks- months (3-5 weeks)

5 species effect human : **S.hematobium, S.mansoni, S.**

Japonicum, S.Mekongi, S. Intercalatum.

May remain asymptomatic for years. symptomatic begin in children with mild anemia, malnutrition, and learning difficulties. Within days after becoming infected, they may develop a rash or itchy skin (cercarial dermatitis) Katayama fever (the acute stage) begins 2-10 weeks after infection presented with cough, fever, lymphadenopathy and hepatosplenomegaly.

Continuing infection may cause granulomatous reactions and fibrosis in the affected organs, which may result in manifestations that include:

- Colonic polyposis with bloody diarrhea (*Schistosoma mansoni* mostly);
- Portal hypertension with hematemesis and splenomegaly (*S. mansoni, S. japonicum*);

- Cystitis and ureteritis (*S. haematobium*) with hematuria, which can progress to bladder cancer;
- Pulmonary hypertension (*S. mansoni*, *S. japonicum*, more rarely *S. haematobium*);
- Glomerulonephritis

Laboratory diagnosis

1-Microscopic identification of eggs in stool or urine is the most practical method for diagnosis. The eggs of *S. haematobium* are ellipsoidal with a terminal spine, *S. mansoni* eggs are also ellipsoidal but with a lateral spine, *S. japonicum* eggs are spheroidal with a small knob.

2-Immunological tests: FAT, ELISA, Antibody detection can be useful in both clinical management and for epidemiologic surveys.

3-Investigation of *S. haematobium* should also include a pelvic x-ray as bladder wall calcification is highly characteristic of chronic infection.

4-Tissue biopsy (rectal biopsy for all species and biopsy of the bladder for *S. haematobium*) may demonstrate eggs when stool or urine examinations are negative.

Factor causes endemic:

- 1- Environmental sanitation: water supply, water channels, contamination.
- 2- System of irrigation
- 3- Migration from rural to urban area
- 4- Seasonal: summer more than winter
- 5- Socioeconomic: low standard living
- 6- Host factors: increase with 10-19 yr. old, male > female, occupational
- 7- Ecology: snails affected by salinity, also pure water unfavorable for breeding, temperature more than 30c are not good for breeding.

Treatment

- 1- Metriphonate (Bilarcil) is the drug of choice, 10mg/kg once every 2weeks for 3 doses.
- 2- Schistosomiasis is readily treated using a single oral dose of the drug Praziquantel(Biltricide) single oral dose 30-40 mg/ kg or 3times a day. While Praziquantel is safe and highly effective in curing an

infected patient, it does not prevent re-infection by cercariae and is thus not an optimum treatment for people living in endemic areas.

3- There is a second drug available for treating *Schistosoma mansoni* (exclusively) called Oxamniquine.

4- Mirazid, a new Egyptian drug, is under investigation for oral treatment of the disease.

Prevention & Control

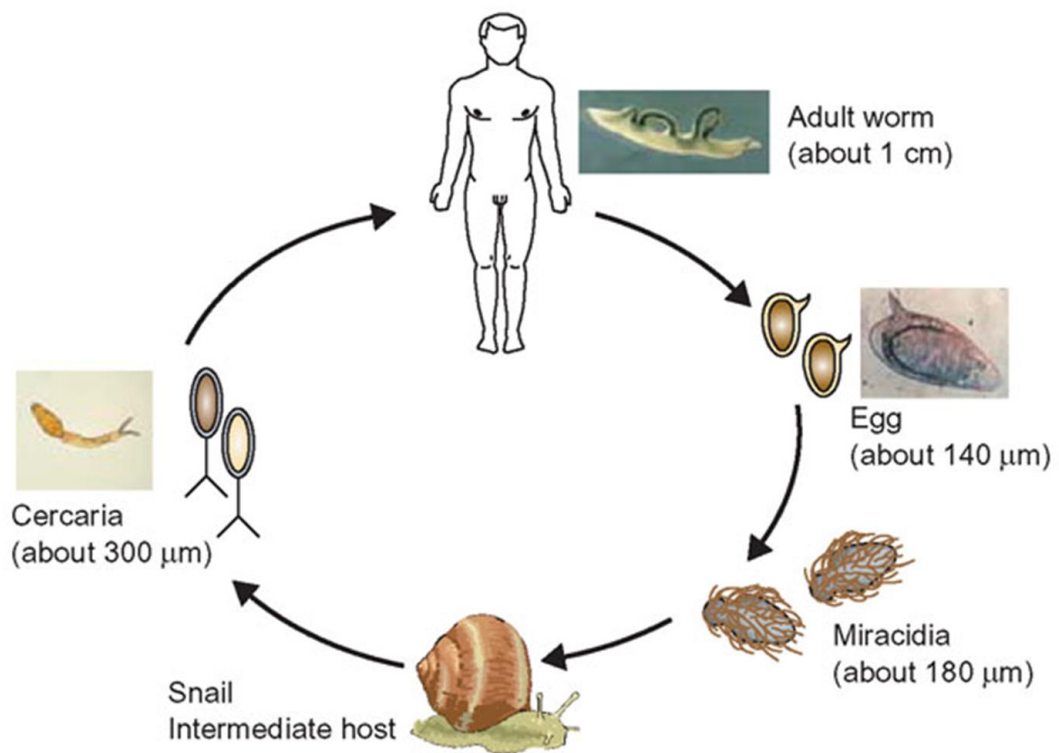
- Health Education, know the life cycle and M.O.T, wearing protective clothes, avoid exposure with contaminated water, right and hygienic defecation and urination habits.
- Drink safe water, also water used for bathing boil for 1 minute to kill any cercariae.
- Eliminating the snail.
- Avoid swimming or wading in rivers where the infection is endemic.
- Eliminating the water-dwelling snails which are the natural reservoir of the disease and that are required to maintain the

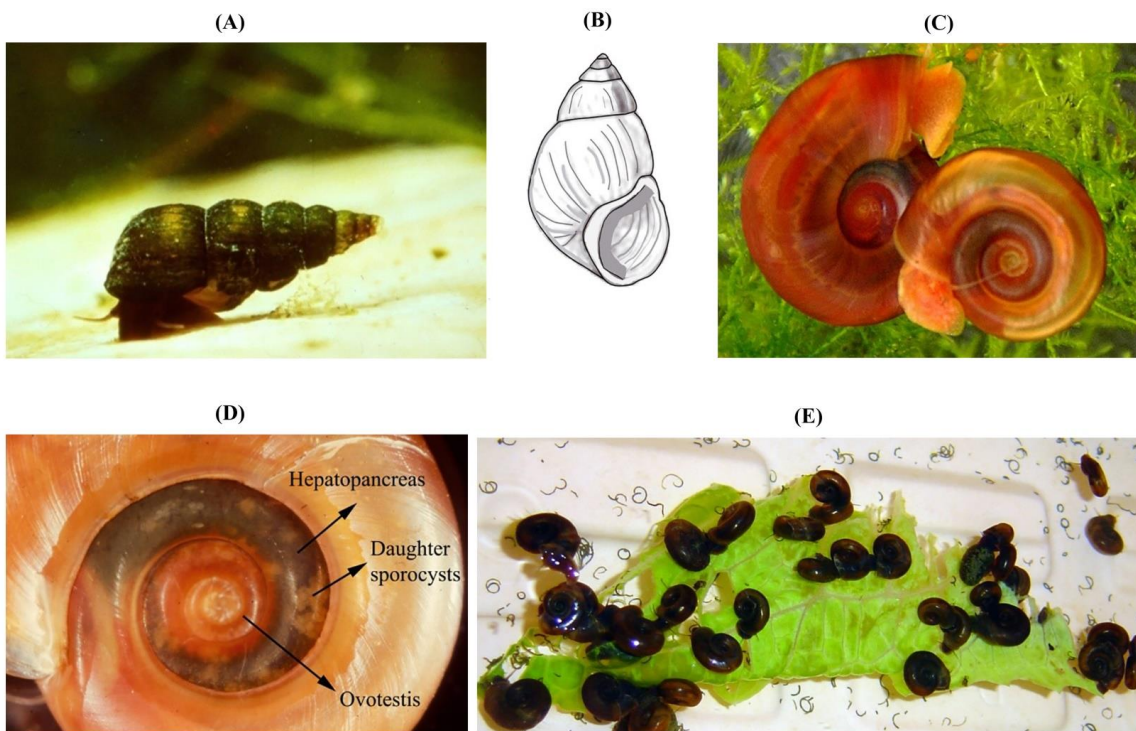
parasite's life cycle. (copper sulfate. Also introducing crayfish populations).

- Control measures can include treating and finding all cases and mass drug praziquantel treatment of entire population and targeted treatment of school-age children. No vaccine is found.

Human Schistosomes		
Scientific Name	First Intermediate Host	Endemic Area
Schistosoma guineensis	Bulinus forskalii	West Africa
Schistosoma intercalatum	Bulinus spp	Africa (local)
Schistosoma haematobium	Bulinus spp.	Africa, Middle East
Schistosoma japonicum	Oncomelania spp.	China, East Asia, Philippines

Schistosoma mansoni	Biomphalaria spp.	Africa, South America, Caribbean, Middle East
Schistosoma malayensis	Robertsiella spp.	Southeast Asia
Schistosoma mekongi	Neotricula aperta/ definitive-dog	Southeast Asia (local)





- *Oncomelania hupensis* A (Japaniucm)
- *Neotricula aperta* B (*Mekongi*)
- *Biomphalaria glabrata* C(*Mansoni*)