

Schistosomiasis

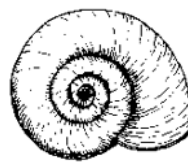
Is a parasitic disease caused by several species of fluke (flatworms) of the genus *Schistosoma*.

Infectious agents

- *Schistosoma* Mansoni (and *S. intercalatum*) → cause intestinal schistosomiasis
- *S. Haematobium* → causes urinary schistosomiasis
- *S. Japonicum* (and *S. mekongi*) → cause Asian intestinal schistosomiasis

Intermediate Snail Hosts

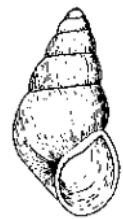
- *S. mansoni*: *Biomphalaria*
- *S. haematobium*: *Bulinus*
- *S. japonicum*: *Oncomelania*



Biomphalaria



Bulinus



Oncomelania

Reservoir

- Human → *S. Haem.* & *S. Mansoni* & *S. Intercalatum*.
- Man, dog, cat, pig, cattle & wild rodent → *S. Japonicum*.

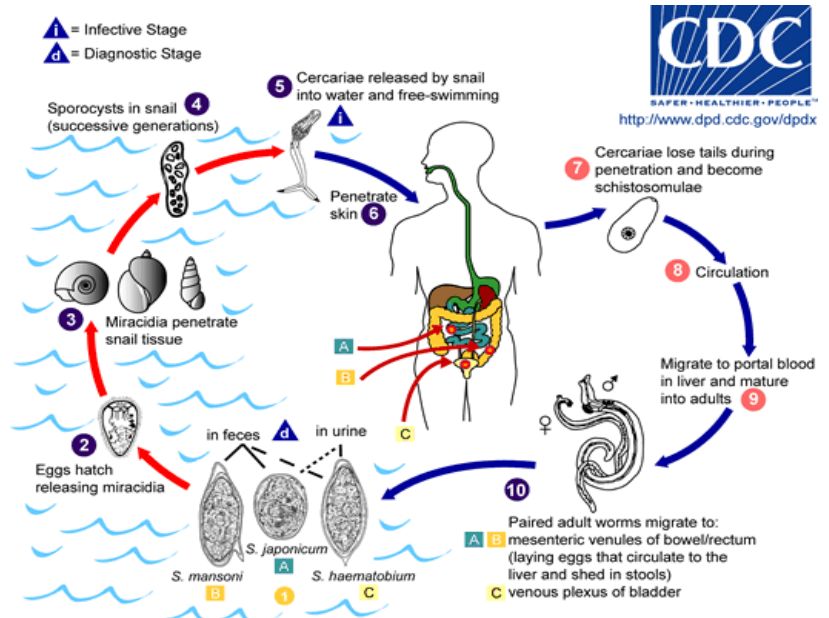
Incubation period: 2 -6 weeks

Mode of transmission: Infection is acquired from water containing free-swimming larval form (cercariae) that have developed in snail.

1- Person distribution

Age: Any age but children most affected, 5-15 years (peak incidence)

Sex: Males are more exposed than females



2- Time distribution:

Infection with schistosomiasis is more common in summer due to:-

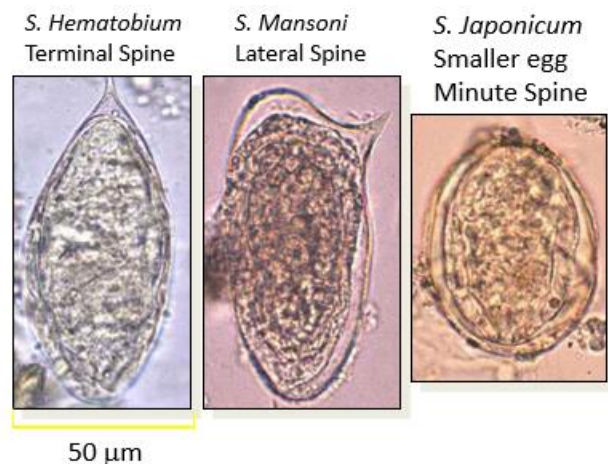
- Swimming and contamination of canal water by urine or faeces is more common in summer.
- The out-put of cercariae from infected snails is more in summer, as the light is strong and heat is maximal, since the cercariae prefers heat and light.
- Minimal infection occurs in winter as the out-put of cercariae from infected snails are sluggish, as well as the cycle inside the snails is reduced during winter.

3- Place distribution

- *S. haematobium*: is found in large parts of Africa, parts of the Arabia, the Middle East, Khuzestan Province in Iran, Madagascar and Mauritius.
- *S. mansoni*: is found in many countries in Africa, South America (Brazil, Surinam and Venezuela), the Caribbean and in parts of the Middle East.
- *S. japonicum*: is found in the Far East, particularly China and the Philippines, but not any longer in Japan where successful control programs have been implemented.

Schistosomiasis Diagnosis:

- History
- Symptoms
- Histology
- Eggs in the urine or stool



Three Major Factors

Three major factors are responsible for the occurrence of schistosomiasis

- **The method of disposal of human excreta**
- **The presence of the snail intermediate host**
- **The contact with cercaria-infected water**

Determinants or Ecology of Schistosomiasis:

The disease is affected by the following factors:

1) Human health habit

- Defecation and urination in canal water.
- Swimming and bathing in canal water.
- Irrigation is considered as one way for infection.

2) Factors related to the distribution of snails

- Nature of water : It must be **fresh** with some degree of **salinity** , Depth of water : Snail live usually in marginal water , that is why they are present in **tertiary canals** in high quantities.
- Water Current: snails usually prefer **sluggish** current of water,
- Dryness: Although these snails are **aquatic**, they still resist dryness but prolonged dryness kill the snails.
- Sun light: is needed for reproduction and survival of the snails.
- Temperature: The suitable temp. needed ranges from **22°C –28°C**, the temp. is needed for ovi-position and hatching of eggs
- Oxygen: Snails need **slightly polluted water**, but heavy pollution of water leads to death of snails.

Clinical picture:

- It runs in a period of generalized reaction during penetration of the cercaria, but this is usually ignored.
- Urinary Bilharziasis is characterized by dysurea and terminal haematuria.
- Intestinal bilharziasis is characterized by dysenteric symptoms.
- Serious complications may occur as carcinoma of the bladder and liver fibrosis.
- Period of communicability: So long as the case passes living ova in stool or in urine.

Swimmers Itch

Hot weather and south breeze (or no breeze) sometimes brings a parasite which causes a condition called "swimmers itch" or "green itch".

This parasite causes small mosquito-bite-sized spots on the skin which can itch like crazy. Most susceptible to this are kids who play in the shallow water near shore on still, hot days.

To avoid this condition, please follow this advice:

- When you leave the water, do not allow the lake water to dry on your skin.
- Rinse off with a hose and towel dry to remove the parasite before it reacts with your skin.

Prevention and control:

The program is composed of four approaches that must run together:

I- Chemotherapy : Praziquantel, Oxamniquine, Metrifonate

II- Snail control

III- Health education

IV- Environmental sanitation

I- Chemotherapy

There are 3 ways for providing the drug

1) Mass comprehensive treatment :

It is mass treatment to the entire population without prior investigation. It is indicated when the disease is highly endemic, the drug given must be cheap effective, with minimal side effects.

2) Selective population treatment:

The drug is given after urine and stool examination for positive cases only.

3) Selected group treatment:

Provision of the drug for selected group like school children

II-Snail control:

This aims at reducing the number of snails.

It can be done by:

1-Mechanical Methods as:

- Cleaning of vegetations
- Proper banking of canals
- Establishment of straight canals.

- Application of nets to prevent the passage of snails,

2-Chemical methods: (Molluscicides)

- Copper sulphate (20-30 ppm.)
- Sodium pentachlorophenate (5-10 ppm)
- Bayluscide (0.5 ppm)

3- Biological control (some species of fish).

III -Health education

- The aim of health education is to change the habits of the people in order to acquire healthy habits

IV-Environmental sanitation:

- Provision of pure water supply
- Provision of sanitary W.C.
- Mechanical methods of irrigation.
- Establishment of recreation places for children.

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