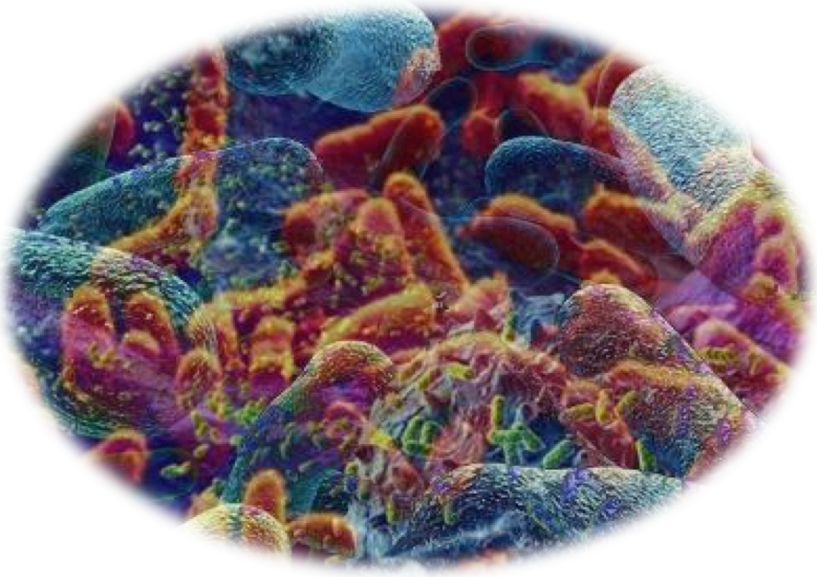
431 Microbiology Team

Schistosomaisis

GIT & HAEMATOLOGY BLOCK



Leaders:

Faisal Al Rashid, Eman Al-Shahrani

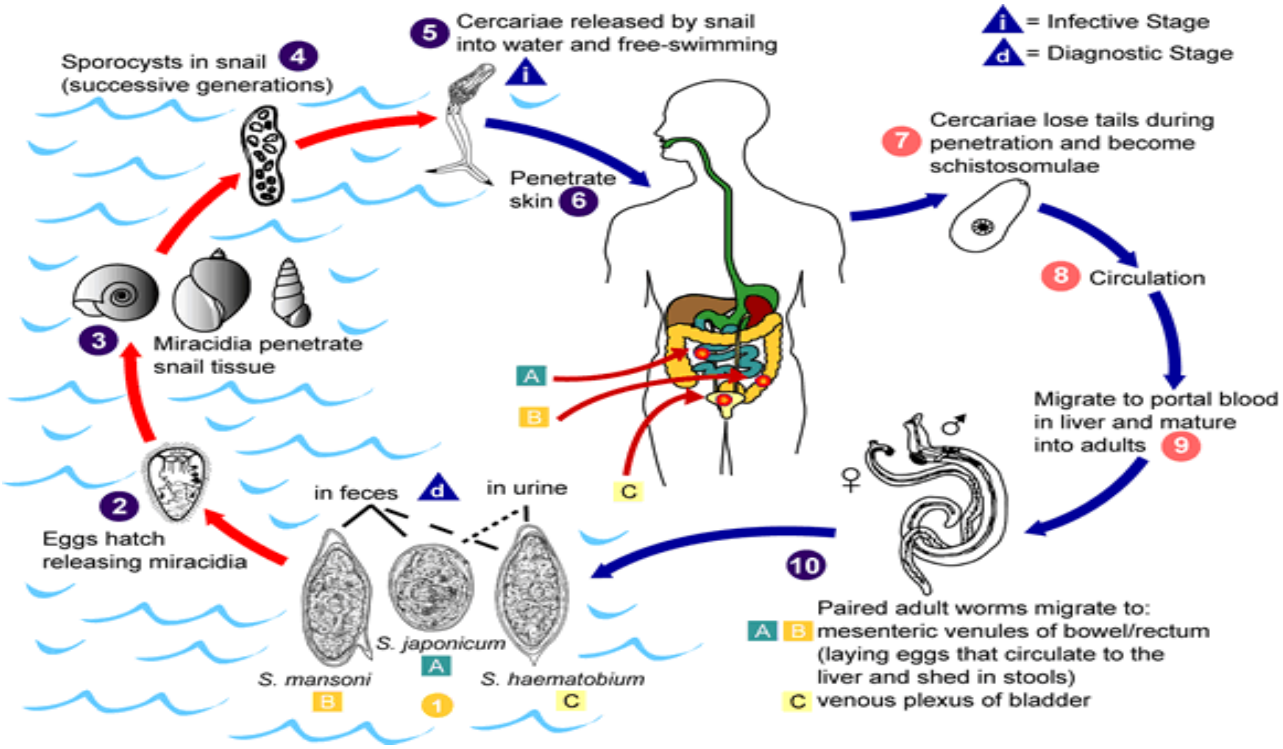
Done by:

Mohammed Al Enezi – Nourah Al-Swaidan

Schistosomaisis

Summary of the life cycle:

1) Eggs pass in stool/urine (diagnostic stage) and then hatch into miracidia in the contaminated water.
3) Miracidia penetrate snail (intermediate host) tissue and mature into cercariae.
5) Cercariae are released in water, and then penetrate human skin. It loses its tail during penetration of the skin (infective stage).
6) Cercariae enter the blood circulation as schistosomulae and go to the liver by portal circulation and mature into adults
7) Adult worms lay eggs either in bowel/rectum (S.mansoni) or in the bladder (S.haematobium), which circulates to the liver (chronic complications).
8) Eggs appear in stool/urine and contaminate water.

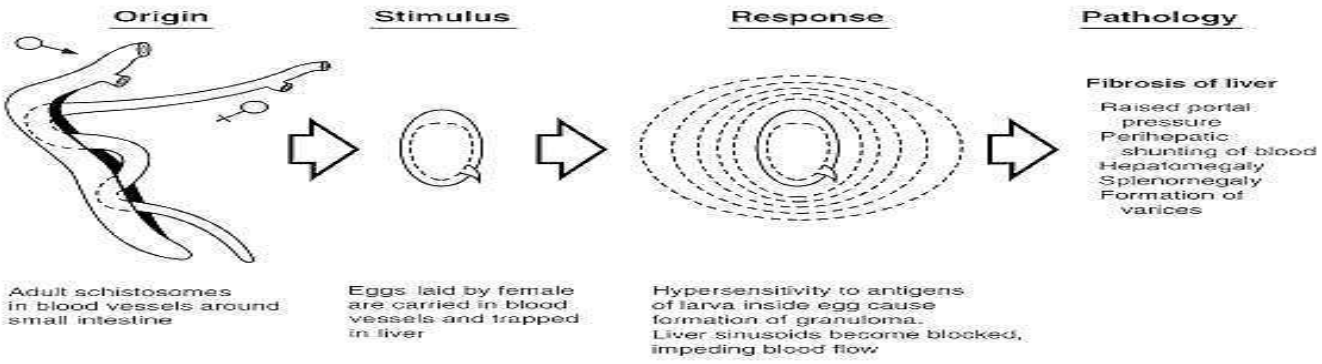


Notes*

- S. Mansoni → Lateral Spine
- S. Haematobium → Terminal Spine
- S.Japonicum → has a small spine not (seen only in japan and near areas)

Spine helps differentiate between different types of shistosmaiasis (it is the cause of bleeding)

Pathogenesis



Eggs deposition ⟶ hypersensitivity reaction ⟶ Formation of granuloma ⟶ Fibrosis

S.Haematobium	S.Mansoni
1. PREPATENT PERIOD 10-12 wks. 2. EGG DEPOSITION AND EXTRUSION: 1. Painless haematuria 2. Inflammation of bladder and burning micturition 3. TISSUE PROLIFERATION AND REPAIR: 1. Fibrosis, papillomata in the bladder and lower ureter leading to obstructive uropathy. 2. Periportal fibrosis 3. Lung and CNS involvement Blood in urine Urinary complications Terminal spine in its eggs	1. PREPATENT PERIOD 5-7 wks 2. EGG DEPOSITION AND EXTRUSION: 1. Dysentery (blood and mucus in stools) 2. Hepatomegaly splenomegaly 3. TISSUE PROLIFERATION AND REPAIR:Fibrosis, 1. Papillomata in intestine, 2. Periportal fibrosis, hematemesis 3. Lung and CNS involvement. Blood in stool GIT complications Lateral spine in its eggs
Diagnosis	
▪ Parasitological: ○ **Examination of urine** ▪ Immunological ○ Serological tests ▪ Indirect: ○ Radiological ○ Cystoscopy	▪ Parasitological ○ **Examination of stools** ▪ Immunological ○ Serological tests ▪ Indirect: ○ Radiological ○ Endoscopy

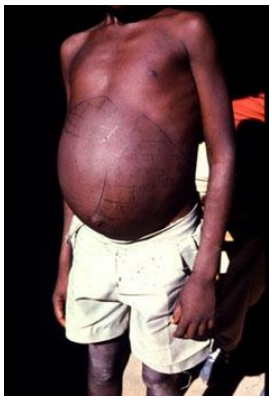
Prepatent period: The interval between infection of an individual by a parasitic organism and the first ability to detect from that host

Extrusion: The act or process of pushing or thrusting out

Both pathogens have the same chronic complications:

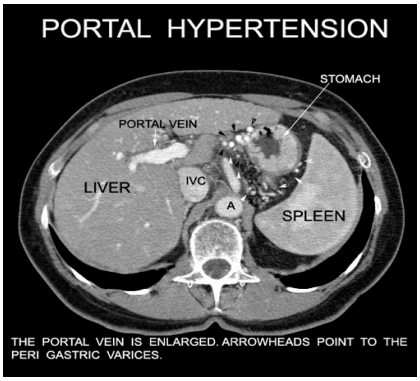
A) Raised portal pressure (chronic schistosomaisis)
B) Perihepatic shunting of blood
C) Hepatomegaly and Splenomegaly (chronic schistosomaisis)
D) Formation of varices

Treatment: Praziquantel



Hepatosplenomegaly in chronic schistosomiasis

Schistosome dermatitis, or "swimmers itch" occurs when skin is penetrated by a free-swimming, fork-tailed infective cercaria.

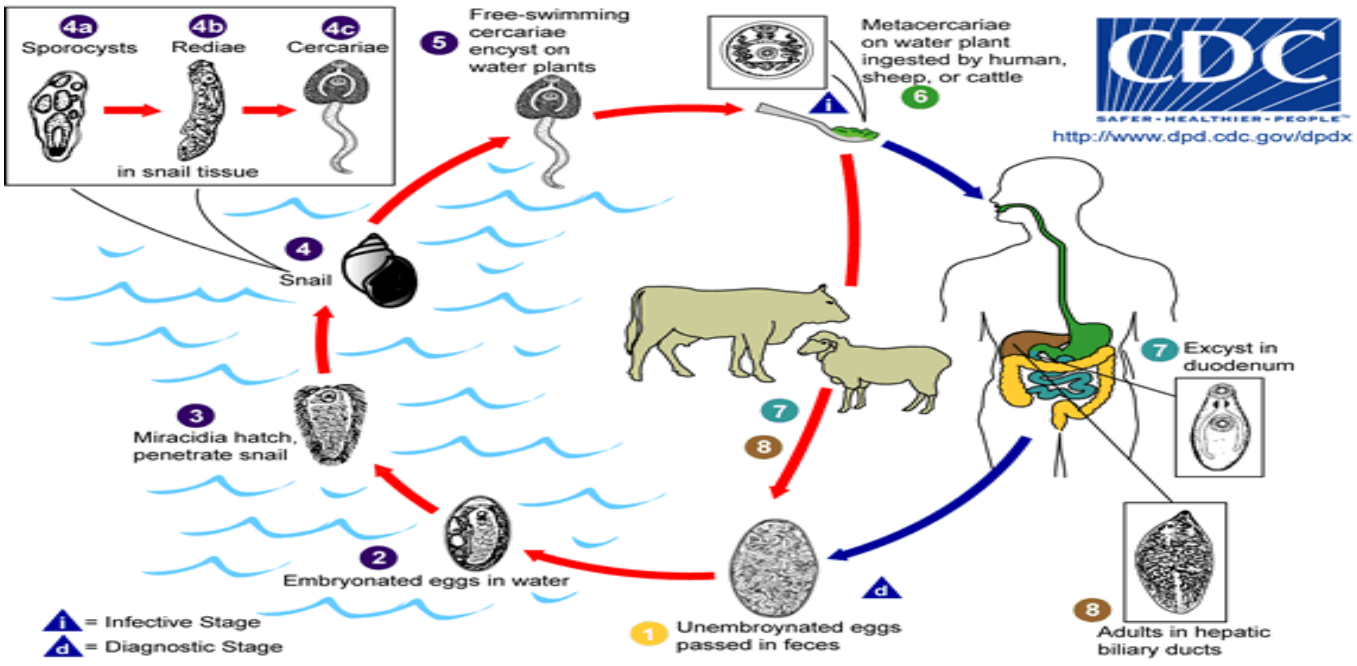


CT scan showing portal Hypertension.
Portal Hypertension can be diagnosed by CT scan.

Fasciola hepatica

Summary of life cycle:

1. Eggs passed in feces (diagnostic stage) and contaminate water
2. Miracidia hatch and penetrate snail's tissue (intermediate host) developing into cercariae
3. Free swimming cercariae encyst in water plants
4. Metacercariae on water plants ingested by humans, sheep or cattle (infective stage).
5. Metacercariae encyst in the duodenum, and get transmitted to the liver and bile ducts.
6. Adults grow in the liver and produce eggs, which appear in stool.



Notes*

- Fasciola hepatica is an animal disease human infection is usually accidental
- Eradication of disease is by eradicating the intermediate host (snail)

Watercress, one means of transmission of fascioliasis

Pathology

a) **True infection:** causes mainly biliary obstruction and liver damage by adult worms.
b) **False infection:** eggs are eaten in infected animal liver and passed in stools.

Diagnosis

1- Test stool for eggs
2- Duodenal aspirate (metacercariae in duodenum)

Treatment

Triclabendazole is the drug of choice to treat fascioliasis and is on the WHO list of essential medicines. Dosage is calculated based on the person's weight (10 mg/kg) and the tablets are given at one time.

Life cycles are very important

Summary

Schistosomaisis

life cycle:

- Diagnostic stage → eggs in stool (S.mansoni) and urine (S.Haematobium)
- Intermediate host → miracidia in snail
- Infective stage → cercariae through skin

Pathogenisis: Eggs deposition → hypersensitivity reaction → Formation of granuloma → Fibrosis

S.haematobium: Blood in urine, Urinary complications, Terminal spine in its eggs

S.Mansoni: Blood in stool, GIT complications, Lateral spine in its eggs

Chronic complications:

- Raised portal pressure (chronic schistosomaisis)
- Perihepatic shunting of blood
- Hepatomegaly and Splenomegaly (chronic schistosomaisis)
- Formation of varices

Treatment: *Praziquantel*

Fasciola hepatica

life cycle:

- Diagnostic stage → eggs in stool
- Intermediate host → miracidia in snail
- Infective stage → metacercariae (by water plants eaten by humans or animals)

Pathogenisis:

- True infection → biliary obstruction + liver damage (adult worm)
- False infection → worms are eaten with food and passed in stool

Treatment: *Triclabendazole*

Questions

Q1: At what stage of Schstosomaisis does it become infective?

a) Eggs
b) Miracidia
c) Cercariae
d) Adult

Q2: Which one of these is NOT true about S.Haematobium?

a) It causes hematuria
b) Periportal fibrosis
c) Hepatomegaly
d) Papillomata in the bladder and ureter

Q3: Drug of choice for Fasciola hepatica?

a) Metronidazole
b) Triclabendazole
c) Tinidazole
d) Praziquantel

Answers:
C,C,B