

Schistosoma and hydatid cyst

Classification of Schistosoma species



Geographical distribution and habitat



S. japonicum

Superior mesenteric veins mainly that supply the small intestine but can invade inferior mesenteric veins that supply the large intestine too

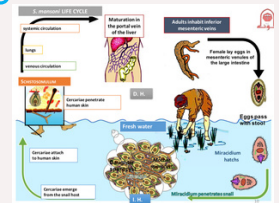


S. mansoni

Inferior mesenteric veins that supply the large intestine

Life cycle

- Habitat: Inferior mesenteric veins
- DH: Man
- IH: Biomphalaria alexandrina snail
- RH: Monkeys and rodents
- Diagnostic stage: Egg
- Infective stage: Furcocercus cercaria
- Mode of infection: Swimming or drinking infected water



Schistosoma mansoni

Stages of disease

1- Stage of invasion

Manifestations

- ❖ Skin lesion due to cercarial penetration.
- ❖ Local dermatitis, irritation, itching and papular rash.

2- Stage of migration

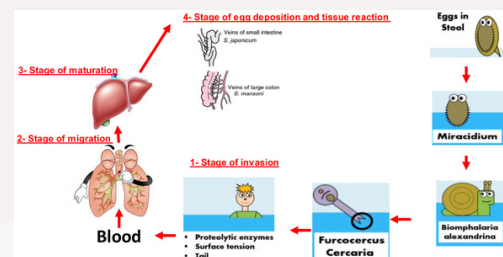
- ❖ Lung: Irritation due to passage of schistosomulum causing minute haemorrhage, cough, sputum, dyspnea and eosinophilia, and pneumonitis.
- ❖ Liver: Enlarged tender liver and spleen.
- ❖ Toxic symptoms: Due to metabolic products of maturing parasites causing fever, anorexia, headache, malaise and muscle pain

3- Stage of maturation (acute schistosomiasis-Katayama syndrome)

- The development of schistosomes into sexually mature, egg-producing adults with the beginning of egg-laying produces a form of acute schistosomiasis which is a systemic hypersensitivity reaction like serum sickness.
- It is manifested by fever, vomiting, diarrhea, enlarged lymph nodes and hepatosplenomegaly with marked eosinophilia.

4- Stage of egg deposition and tissue reaction

- ❖ Trapped eggs in the intestinal wall formation of polyps, ulcers and granuloma causing abdominal pain, diarrhea and dysentery.
- ❖ Later on, the intestinal wall becomes fibrosed and thickened stricture of the wall.
- ❖ Sinuses or fistula can occur.
- ❖ Rectal prolapse.
- ❖ The eggs secrete proteolytic enzymes that provoke typical eosinophilic inflammatory and granulomatous reactions (bilharzial granuloma), which are progressively replaced by fibrotic tissue which is the main cause of pathology and complications.



Schistosoma and hydatid cyst

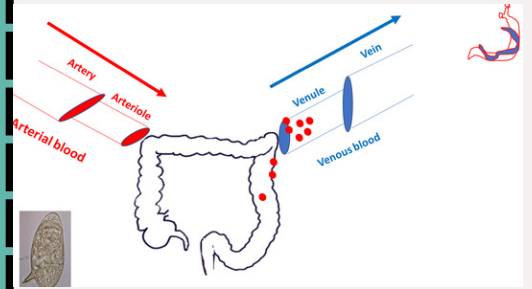
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4- Stage of egg deposition and tissue reaction
Eggs can reach the intestinal wall by:

- 1- Egg spine.
- 2- Proteolytic enzymes.
- 3- Elastic recoil of blood vessels.

The eggs have three destinations:

- 1- Pass through the wall to the lumen, or
- 2- Trapped in the wall which leads to granuloma, fibrosis, and strictures
- 3- Eggs moved with the venous circulation forming embolism. (Liver, lung, CNS, skin,)



Embolic lesions
Some eggs are swept back into the blood stream to different organs:-

Liver
Periportal fibrosis
portal hypertension
hepatosplenomegaly
ascites, oesophageal
varices(hematemesis)
and hemorrhoids

Brain
Cerebral
schistosomiasis
(more common with
S. japonicum than
S. mansoni)

Skin and kidney
Dermatitis and
glomerulonephritis

Lung
Biharzial cor-pulmonal
Pulmonary
hypertension & Rt. side
heart failure with
fever, dyspnea, cough,
haemoptysis & lower
limb edema.



Schistosoma and hydatid cyst



Clinical picture summary

Satges	Clinical aspect	Manifestations
Early	1. Cercarial dermatitis	At the penetration sites of cercariae → itching & papular eruption
	2. Schistosomular migration	Migration of schistosomula → lungs : pneumonitis (fever, cough and haemoptysis) and → liver (tender hepatomegaly)
	3. Acute schistosomiasis (Katayama syndrome)	It occurs when worms mature in the liver, migrate to the small venules and begin to lay eggs. There is fever, abdominal pain, diarrhoea, wheezing, urticaria, marked eosinophilia, sometimes lymph node enlargement and hepatosplenomegaly.
Late	1. Chronic Intestinal schistosomiasis	Oviposition in the mesenteric plexus → diarrhoea with blood and mucus (schistosomal dysentery)
	2. Chronic hepatosplenic schistosomiasis	Granuloma Formation in the liver → periportal fibrosis → Obstruction of the portal venous branches → portal hypertension → hepatomegaly & splenomegaly
	3. Advanced complications	Hypersplenism → Anaemia + thrombocytopenia Extensive periportal fibrosis → Hepatic failure Portal hypertension → Opening of porto-systemic collateral → oesophageal varices → fatal haematemesis Egg embolism → Lung & CNS Ascites due to hypoproteinaemia + portal hypertension



Schistosoma and hydatid cyst



Laboratory diagnosis

Direct

- 1) Detection of eggs in the stool by direct smear or concentration .
- 2) Thick faecal smear .
- 3) Rectal swab.
- 4) Rectal biopsy or liver biopsy in chronic stage

Indirect

- 1) Intradermal test.
- 2) Serological tests : IHAT, CFT, and ELISA.
- 3) Recently: Detection of circulating *Schistosoma* antigens by using of monoclonal antibodies
- 4) Anaemia:-
 - > Iron deficiency anaemia due to blood loss.
 - > Haemolytic anaemia due to hypersplenism.
- 6) Eosinophilia

Treatment

Medical

- Praziquantel effective against adult worms
- Artemisinin effective against schistosomulum

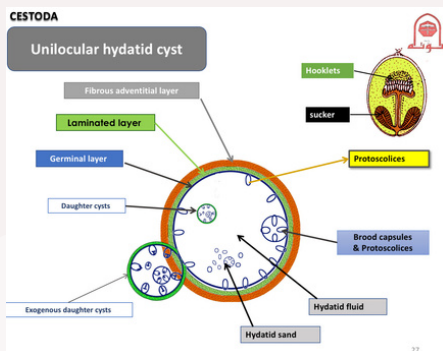
Surgical

For complications

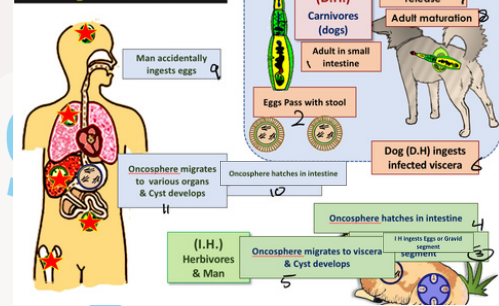


Hydatid cyst disease

Life cycle



Life Cycle of Echinococcus granulosus



Hydatid cyst disease [Cystic Echinococcosis or Hydatidosis]

- ❖ It is a parasitic infection of both humans and other mammals such as sheep, and cattle with hydatid cysts, the larva I stage of *Echinococcus granulosus*.
- ❖ Man is an intermediate and blind host for *Echinococcus granulosus*

Pathogenesis & Symptomatology

Local inflammatory reaction around the hydatid cyst, ending in formation of a fibrous capsule which may become calcified or even ossified.

The symptoms depend on the size & site of the cyst.

Large sized cysts ⇒ pressure atrophy of affected organs:-
Liver (70%) ⇒ enlargement and dysfunction (fever, pain and jaundice).
Lung (20%) ⇒ pain, cough and dyspnea.
Brain ⇒ epilepsy.
Eye ⇒ protrusion of the eye ball.
Bones ⇒ Pain & spontaneous fracture.
Kidney ⇒ membranous nephropathy.

Spontaneous rupture of cyst into peritoneal cavity or pleura may lead to severe allergic reaction (anaphylactic shock) or secondary cysts.



Schistosoma and hydatid cyst

Diagnosis

Clinical

- History of contact with dogs.
- Slowly growing cystic tumour.
- Hydatid thrill.

Laboratory

Direct

- X-ray for calcified cyst.
- Ultrasonography, CT scan and MRI.
- Scolices in sputum or urine due to rupture of the cyst in bronchus or urinary tract.
- Puncture or aspiration of hydatid fluid
➡ may lead to anaphylactic shock due to leakage of the fluid.

Indirect

- Eosinophilia.
- Intradermal test (Casoni test).
- Serological tests.
- PCR

Treatment

1. **Surgical removal of the cyst:** The most efficient treatment but it may cause mortality (2%) and recurrence of the disease (2 - 25%).

2. **Percutaneous treatment (PAIR):** In three steps:

Puncture (P) and needle aspiration (A) of the cyst.

Injection (I) of a scolicidal solution usually hypertonic sodium chloride

solution or ethanol and left for 5 - 30 minutes. Cyst-re-aspiration (R) and final washing.

✓ This procedure is indicated in **inoperable** cases and who have **drug resistance** (no response to medical treatment).

3. **Medical treatment:**

Indications: In inoperable cases and before and after surgery.

➤ Albendazole (**Drug of choice**).

➤ Mebendazole.

➤ The combination of ABZ and Praziquantel (PZQ) may provide **synergistic effect and better efficacy**.

﴿يُدَبِّرُ الْأَمْرَ﴾

"كلَّ أَمْرٍ .. فَلَا يَخْرُجُ أَمْرٌ عَن نَّدْبِيرِهِ!

أَمْرَ الْعَالَمِ أَجْمَعِ، وَلَا يُشْغَلُهُ نَدْبِيرٌ عَن نَّدْبِيرِ، يَنْفَعُ الْخَلْقَ مِنْ حَالٍ إِلَى حَالٍ، وَمِنْ مُبْدَأٍ

إِلَى أَحْسَنِ مَالٍ ..

حَتَّى أَمْرِكَ وَسَأْنِكَ يُدَبِّرُهُ بِعِلْمِهِ اللَّامِلِ، يُدَبِّرُهُ بِحِكْمَتِهِ الْبَالِغَةِ، يُدَبِّرُهُ بِقُدْرَتِهِ النَّامَةِ."