

- بسم الله الرحمن الرحيم
- Schistosomiasis
- Objectives
  - Discuss the epidemiology and etiology of Schistosomiasis
  - Describe transmission and life cycle of Schistosomiasis
  - Discuss pathogenesis and brief clinical presentations of Schistosoma spp.
  - Discuss the complications of Schistosoma spp.
  - Explain lab diagnosis of Schistosomiasis
- Classification of human parasites
- Human parasites divided into two groups
  - single celled protozoa
  - multicellular metazoa

- Characteristic features of trematodes(flukes)
- Flat, leaf-like body that is not segmented
- Schistosomes are parasites that belong to this group
- Trematodes classification
- Blood flukes (schistosoma)
- **BloodFlukes**
  - *Schistosoma haematobium*
  - *Schistosoma mansoni*
  - *Schistosoma japonicum*
- A genus of trematodes, ***Schistosoma***, commonly known as **blood-flukes** or **bilharzia**, includes number of

species which are responsible for the disease schistosomiasis, and are considered by the World Health Organization as the second most important parasitic disease, next only to malaria, with hundreds of millions infected worldwide.

- Scistosoma anatomy
- Sexes are separate
- Female lies in a cavity in front of the male body known as gynacophoric canal
- Schistosomes
- Also known as **bilharzia**

- Schistosomes are common in Africa and middle east---  
----esp. along the Nile river
- Transmission to humans
- Humans (acquire infection by swimming in water harboring the larval form called cercariae)
- Definitive hosts
- Definitive host are ones in which the adult worm live and mate
- Adult worm lives in the blood stream(portal vein) of humans

- Intermediate host
- Snails in water
- Intermediate hosts are one in which the larval forms develop
  
- *Schistosoma mansoni*, *S. japonicum*, .....Release eggs in intestinal tract and passed to the outside in the stool
- *Schistosoma hematobium*..... release eggs in urinary tract and thus passed to the outside through urine

- **Transmission**
  - Presence of the snail host in water in which larval forms develop
- **Clinical features and pathogenesis**
- **Acute disease**
- **Chronic disease**
- **Cercarial dermatitis**
- **Skin penetration by cercariae-----  
dermatitis(swimmers itch)—  
within 24 hrs**
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**Acute phase (Katayama disease)**

- Acute phase (Katayama disease)
- fever, chills, headache, anorexia, urticaria, and diffuse megaly, lymphadenopathy and diffuse vasculitis lesions
- 2-3 weeks after the infection and usually lasts 1-2 months (typhoid fever)
- Dysentery in *S mansoni* and *S japonicum* infection
- bloody diarrhea----
- *Schistosoma mansoni*, *S. japonicum*, .....Release eggs in intestinal tract
- *Schistosoma hematobium*
- Bloody urine-----hematuria

- In addition there is dysuria and frequency

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## Chronic disease-most important

- Hepatic dysfunction and portal hypertension from cirrhosis of the liver because of eggs in the liver
- Pathogenesis of hepatosplenomegaly
  - Eggs that do not leave the body are swept to the pre-sinusoidal capillaries of the liver and are trapped there
  - The immune system responds and walls off the eggs with a granuloma, the egg dies
  - Continuous stimulation of the immune system leads to fibrosis
  - Periportal fibrosis leads to portal hypertension



- Portal hypertension leads to collateral circulation, esophageal varices
  
- **Schistosome Pathology**
- *Schistosoma hematobium*  
complications
- Granuloma formation and fibrosis at the lower end of the ureter obstructs urinary flow, with subsequent development of hydroureter and hydronephrosis
- High frequency of secondary bacterial infections of urinary tract.
- *Schistosoma hematobium* is a known carcinogen
- Strong association with squamous cell carcinoma of bladder

- Chronic irritation leads to squamous metaplasia->dysplasia->carcinoma

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## **Lab Diagnosis**

- Microscopic identification of eggs in stool or urine (S. hematobium) is the most practical method for diagnosis
- Eggs
- **Lab Diagnosis( cond.)**
- Serology for schistosomal antibodies. Two tests are available : the Falcon assay screening test/enzyme-linked

immunosorbent assay (FAST-ELISA) and the confirmatory enzyme-linked immunoelectrotransfer blot (EITB).

- Esp for katayama fever
- Treatment
- **Praziquantel**
- The dose is 20 mg/kg by mouth 2-3 doses in one day
- **Control measures/**
- **Possible Points of Attack**
- **Sanitation, Water Supply & Community**
  - Health education; Hygiene
  - Socioeconomic development ==> toilets & water systems

- **Snail Control**

- **Molluscicides; Competitors/Predators;  
Habitat reduction/closed  
irrigation; Environmental modification**