**Schistosomiasis**

- Also known as “bilharzia” and “snail fever”
- Second most dangerous parasitic disease after malaria
- Caused by parasitic worms (trematode worms of the genus Schistosoma) that live in certain freshwater snails
- Discovered by Theodor Bilharz
    - first identified the causative agent *Schistosoma haematobium* in 1851.

**Two major forms of Schistosomiasis**

- Intestinal schistosomiasis- affects the digestive system and liver
- Urogenital schistosomiasis- affects the urinary and reproductive organs

**Pathogenesis**

- Miracidium (parasitic worm) invade specific freshwater snails- *Bulinus, Biomphalaria, & Oncomelania*
- Turns to cercariae→Reproduce inside the snails→Worms exits the snail→The snail does not die but will eventually die
- Worm roams around freshwater→Looks for human host→Worm penetrates through human skin (DOES NOT need to be an open wound) →Leaves an infection where it pierced→Cercarial dermatitis (AKA: swimmer’s itch) →Turns to schistosomula
- Schistosomula moves to→Large intestine (Schistosoma mansoni & S. japonicum) or Urinary bladder (S. haematobium) →Grows into a fully adult worm→Reproduces eggs
- Worms will continue to reproduce→Eggs will either: Get stuck in tissues (Causes Katayama disease) or get expelled through fecal or urinary→Cycle continues.

<table>
<tr><th colspan="2">Signs</th></tr>
<tr><td>Acute<br>- Rash<br>- Cough</td><td>Chronic<br>- Blood in urine<br>- Enlarged liver and spleen<br>- Scarring and inflammation of bladder and urinary tract<br>- Intestinal blockage<br>- Gential lesions</td></tr>
<tr><th colspan="2">Symptoms</th></tr>
<tr><td>- Can be asymptomatic<br>- Flu like illness<br>- Itching<br>- Fever<br>- Chill<br>- Muscle ache<br>- Abdominal pain</td><td>- Abdominal pain<br>- Painful and frequent urination<br>- Seizure<br>● If egg reaches the brain<br>- Anemia<br>- Malnutrition<br>- Risk of bladder cancer</td></tr>
</table>

**Treatments**

- Praziquantel
    - Kills the adult worms

- Corticosteroids
    - For severe reactions in the CNS and other damages of the immune system, parasite, and praziquantel
    - Will reduce aftereffects of praziquantel
- Immune system will deal with the eggs
    - Takes delicate process

**What happens if not treated properly?**

- Worms will continue to populate and eggs will keep on either attaching to the tissue or spread infecting more people
- The worms and eggs DOES nothing to the body besides the usual things a parasite does (stealing nutrition)
- Worms camouflage with the bodies cells, and eggs doesn't have much antigens on their shells
    - Makes it difficult to be detected by the immune system, or lab tests
- The immune system are the ones most likely causing damage; can go into 2 scenarios

| **If immune system DOES NOT detect the parasite** | **If immune system DOES detect the parasite** |
|---|---|
| - Parasite will continue to populate and hurt the body indirectly<br>- Chronic stage will occur due to the population of the parasite | - Parasite and eggs will be dealt<br>- The immune system also causes damage as they kill the eggs in the tissues<br>● Can lead to chronic stage |

**Items of Interest**

- Neglected tropical disease
    - The disease is more prominent in economy challenged and poor sanitation practices locations
- Misdiagnosed as: UTI, brain tumor, appendicitis, etc. due to overlapping symptoms and signs
    - Overlaps with other diseases signs and symptoms
    - Can't be seen in imaging and tests of UTI, brain tumor, and appendicitis
    - Takes more tests to diagnose since eggs doesn't get released continuously
- Difficult to eradicate and avoid but not impossible
    - Zoonotic
    - Fresh water cannot be avoided
    - Japan were able to eradicate them in 1950
        - Modified and got rid of host snails habitat and source of food
        - Mass treatments and educating citizens
- 200 million people were diagnosed or infected in 2024 worldwide
- Recovering from this disease is not a gamble
    - If praziquantel was taken this will stop the production of eggs
    - The inflammation of the organs will eventually force the eggs out of the body
- DOES NOT exist in the US
    - The snail hosts does not exist in the US

**How to avoid**

- Avoid these snails: *Bulinus, Biomphalaria, Oncomelania*
- Avoid bodies of water that has fresh water
- Use preventive measures: boiling water, wearing protective gear (boots)
- Only exists in with poor sanitation, tropical and subtropical regions