TREMATODES

SCHISTOSOMIASIS (BILHARZIA)

-LECTURE-14

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...HISTORICAL FACTS

- First described by German pathologist
- Theodore Maximilian Bilharz
- Bilharz performed autopsies on Egyptian patients who had died from the disease: ,found male & female parasite eggs in the portal system & bladder.
- Later seen in Japan, called Katayama fever
- Symptoms: rash on legs, fever, diarrhoea, bloody stools ⊠ emaciation, oedema ⊠ death.

ETIOLOGY OF SCHISTOSOMIASIS

- Schistosomiasis is a global public health problem in the developing world. The disease is caused by trematodes of the genus *Schistosoma* , and it is estimated that 200 million people are infected and that 20 million have debilitating :disease. 3 main Species

S. mansoni
S. japonicum
S. haematobium

Epidemiology

Schistosomiasis occurs mainly in rural .agriculture and periurban areas

S. mansoni **is found in 55 countries, including Egypt, Libya, Sudan, most countries in .sub-Saharan Africa, Brazil &others**

S. hematobium **is endemic in 53 countries in the Middle East and most of the African .continent, including IRAQ**

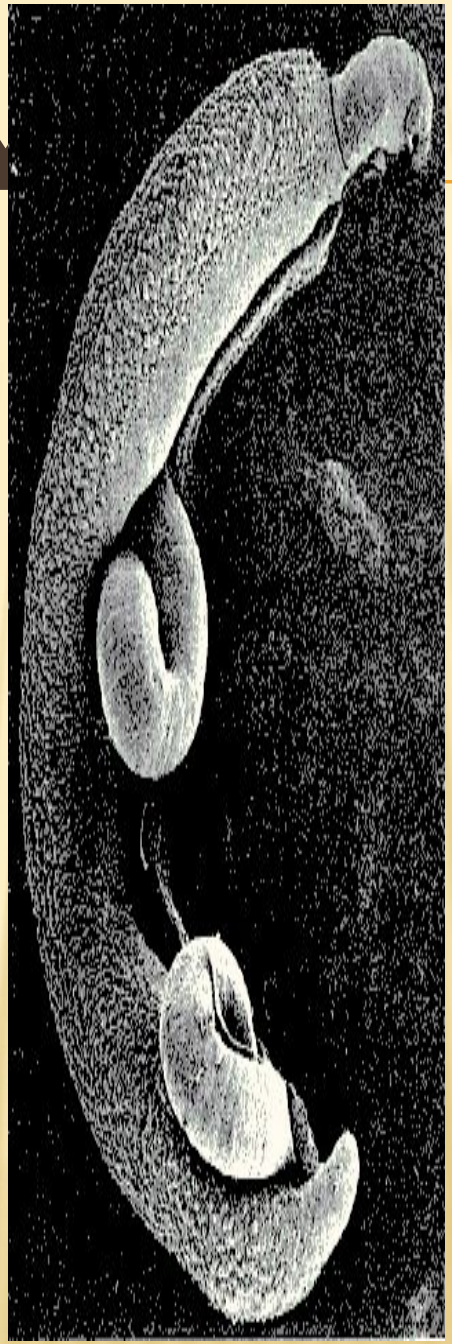
S. japonicum **is endemic in China, Indonesia, and the Philippines and has been reported in .Thailand**

The endemicity of schistosomiasis depends on the urban disposal of urine (***S. haematobium*** **) and feces (** ***S. mansoni*** **,** ***S. japonicum)***

MORPHOLOGY

- **Size:**
- **- Female 12 to 26 mm**
  - Male 6 to 22 mm

The three main species infecting humans are
S. haematobium
S. japonicum
S. mansoni.

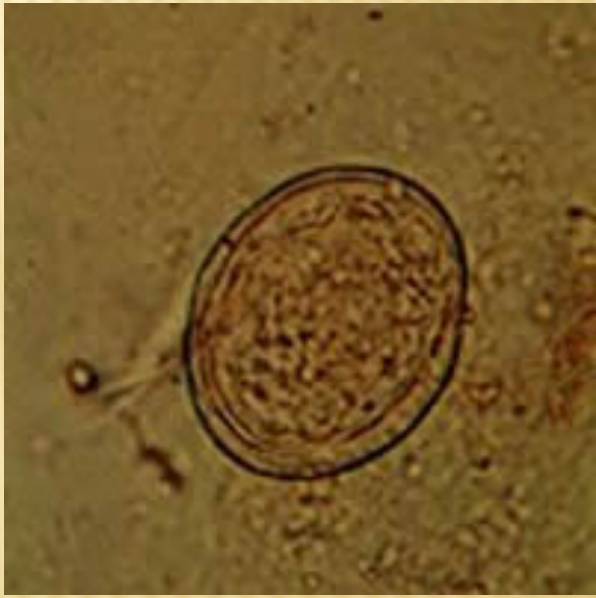


Egg of S. haematobium

Terminal spike

Egg of S.japonicum

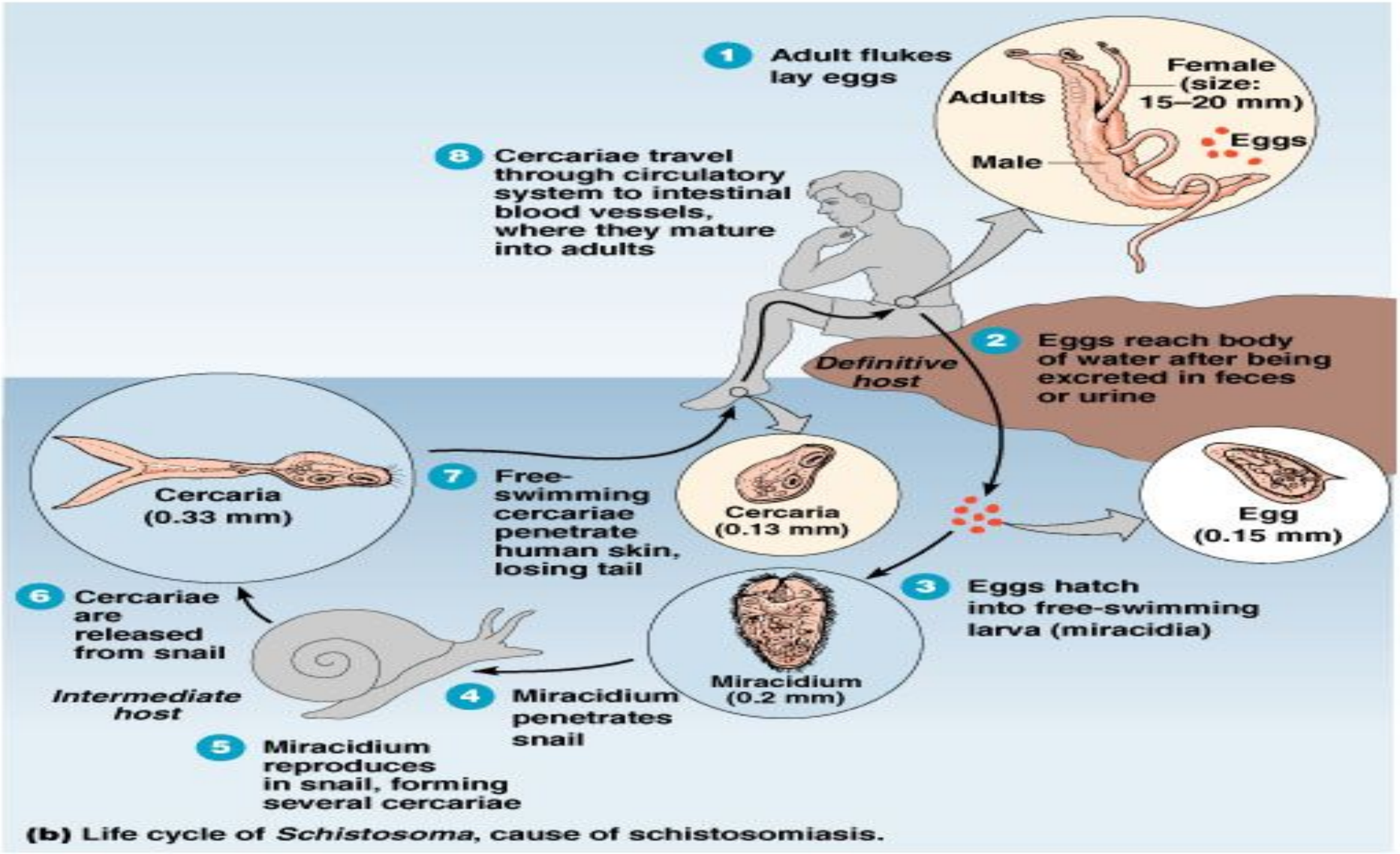
Lateral rudimentary spike



Egg of S. mansoni

Lateral spike

SCHISTOSOMA –LIFE CYCLE



(b) Life cycle of *Schistosoma*, cause of schistosomiasis.

WTDV027421movie life cycle.swf

PATHOGENESIS

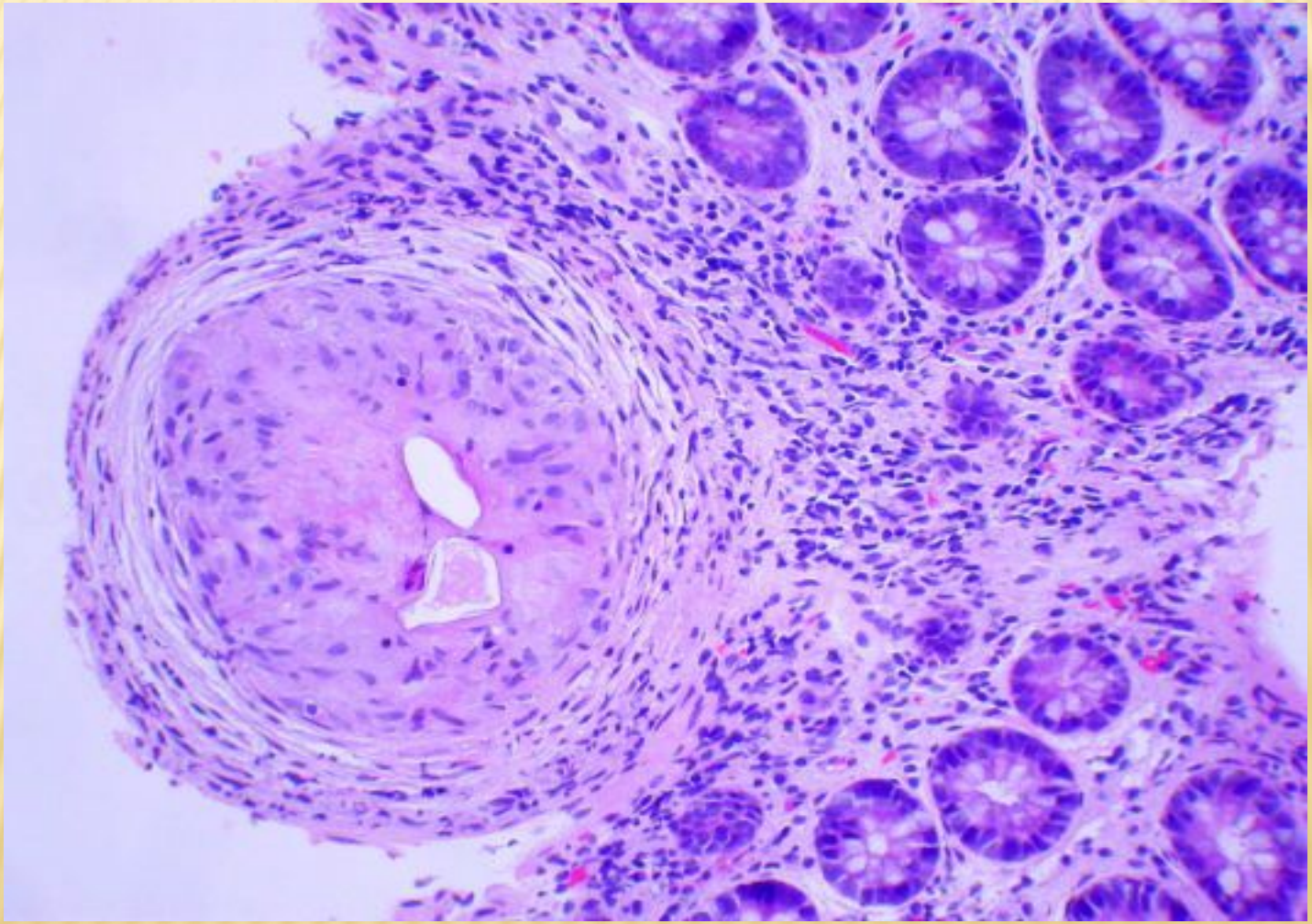
Adult worms live in the mesenteric veins (*S. mansoni* & *S. japonicum*).

or in the venous plexus around the lower ends of the ureters and the urinary bladder (*S. haematobium*). In these sites, they start their sexual reproduction by releasing eggs. Once deposited in the host, eggs may stay in the mesenteric vein, be trapped in the intestines, escape to intestinal lumen, and migrate by portal blood to the liver .(*S. mansoni* , *S. japonicum*)

Eggs of *S. haematobium* may be trapped in the intestines and bladder and may escape to the intestinal or bladder .lumen

The pathogenesis of human schistosomiasis is mainly related to egg deposition and liberation of antigens of adult worms and eggs(tissue injury is mediated by egg-induced .granulomas and subsequent appearance of fibrosis)

GRANULOMA



CLINICAL FEATURES

cercarial penetration -1

.(schistosome dermatitis)

.Acute schistosomiasis -2

.Chronic schistosomiasis -3

CERCARIAE PENETRATE SKIN ITCHY MACULO-PAPULAR RASH ON THE AFFECTED AREA OF THE SKIN.

MOST OFTEN OCCURS 2 TO 3 DAYS AFTER INVASION

- CALLED SWIMMER'S ITCH. CERCARIAL DERMATITIS IS A .SELF-LIMITING BUT SOMETIME STEROIDS INDICATED

ACUTE SCHISTOSOMIASIS

Eggs laid in target organs release antigens Katayama's .fever which may occur weeks after the initial infection

Acute schistosomiasis is becoming a frequent and major clinical problem in non immune individuals from urban regions who are exposed for the first time to a heavy infection in an endemic area(this is common in case of schistosomiasis japonicum & to less extent in mansoni but not reported with S. haematobium)

- fever

chills -

- urticaria

- malaise

diarrhea -

CHRONIC PHASE

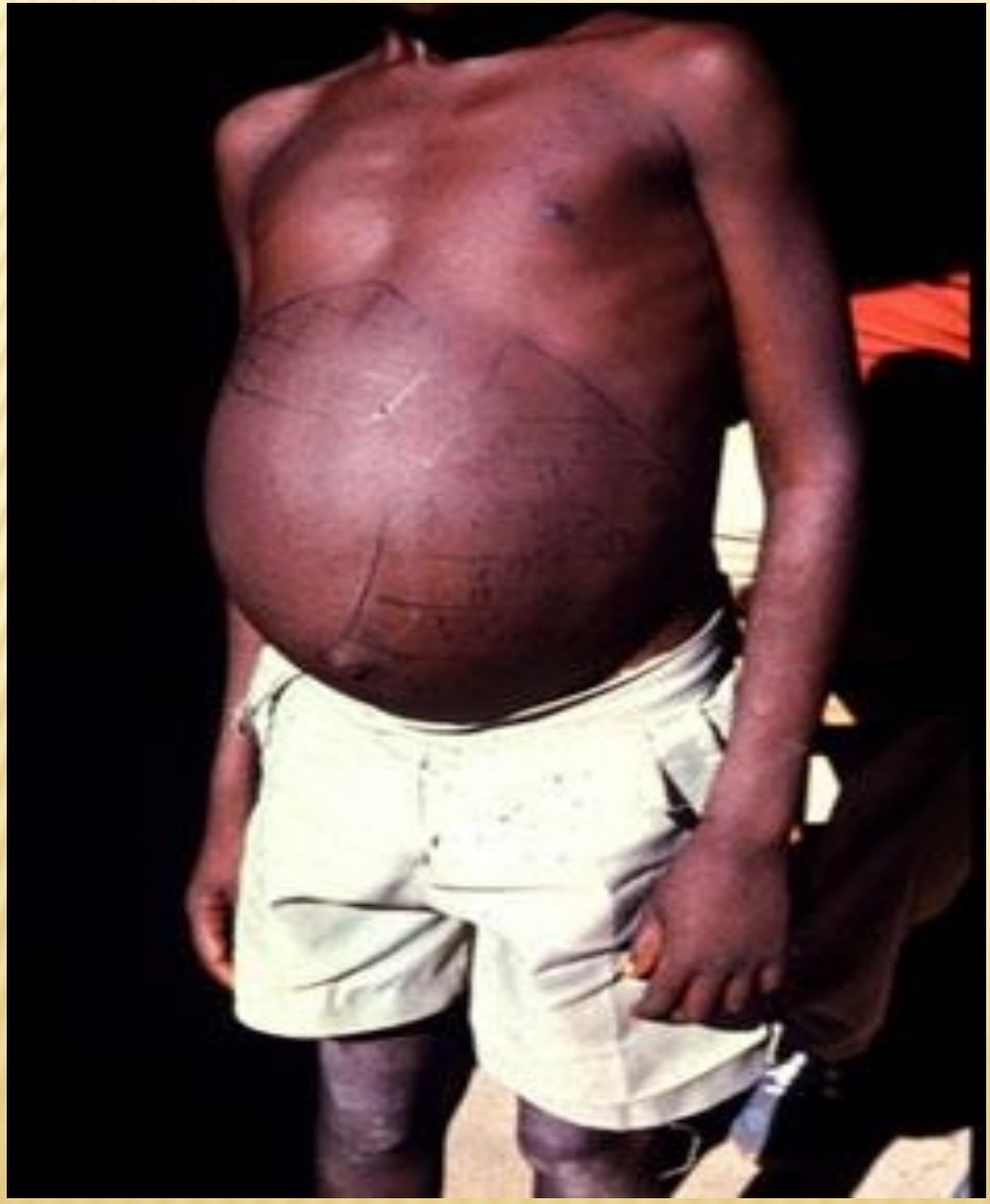
- Symptoms of chronic infection caused by eggs that travel to various parts of body
- About 50% of eggs remain trapped in host tissues secrete Antigens granulomatous inflammatory immune response
- Granulomas: macrophages surrounded by lymphocytes (CD4, CD8 Tcells), which .aggregate at site of infection
- Fibroblast cells also at site of infection which mediate collagen deposition in the . granuloma, leading to fibrosis

CHRONIC SCHISTOSOMIASIS

S. MANSONI & S. JAPONICUM

- Because the habitat of *S. mansoni* & *S. japonicum* are the mesenteric blood vessels, the intestines are involved primarily, and egg embolism results in secondary involvement of the liver. Abdominal pain, irregular bowel movements, and blood in the stool are the main symptoms of intestinal involvement. .Colonic polyposis may occur, especially in Egypt
- Hepatosplenic involvement is the most important cause of morbidity in *S. mansoni* and *S. japonicum* infections. Patients may remain asymptomatic until the manifestation of hepatic fibrosis and portal hypertension. Hepatic fibrosis is caused by a granulomatous reaction to *Schistosoma* eggs that .have been carried to the liver

أصيب العندليب الأسمر عبد الحليم حافظ بالبلهارسيا إثناء طفولته في قرية الحلوات في الشرقية ولم تكتشف اصابته الا عام 1956 عندما اصيب بنزف معوي حاد (بسبب دوالي المرئ) بعد الإفطار في رمضان حيث تبين انه مصاب بتليف الكبد. عولج في عدة مستشفيات خارج مصر وللآسف الشديد تم نقل فيروس التهاب الكبد الفيروسي(C) مع الدم الملوث توفي في 1977/3/30 رحمه الله.



Hepatosplenomegaly in chronic .schistosomiasis Ascites(intraperitoneal fluid collection)

CHRONIC SCHISTOSOMIASIS

S. HAEMATOBIUM INFECTION

In *S. haematobium* infection, the main system involved is the urinary tract. The acute granulomatous response to parasite eggs in the early stages causes urinary tract disease, such as .urethral ulceration and bladder polyposis

Painless terminal haematuria

.is the earliest feature of infection

In chronic disease, usually in older patients, granulomas at the lower end of the ureters obstruct urinary flow and may cause .hydroureters and hydronephrosis

.Bladder fibrosis and calcification are also seen in this phase

Up to 50 to 70% of infected individuals have hematuria, dysuria, or urinary frequency. Urine examination reveals proteinuria and .hematuria

Radiologic findings include hydronephrosis, hydroureter, ureteral strictures, dilation or distortion, ureteral calcifications, ureterolithiasis, calcified bladder, polyps, reduction in bladder capacity, irregular contraction of the bladder wall, or dilated bladder .due to bladder neck fibrosis

An increased incidence of squamous cell carcinoma of the bladder .has been reported in endemic areas of *S. haematobium* infection

CHRONIC SCHISTOSOMIASIS
S. HAEMATOBIUM INFECTION

Intravenous pyelogram shows bilateral & hydronephrosis hydrouretes(dilatation of both ureters) of patient infected with schistosomiasis haematobium

CHRONIC SCHISTOSOMIASIS
S. HAEMATOBIUM INFECTION

Bladder fibrosis and calcification,polyps, reduction in bladder capacity, irregular contraction of the bladder wall & an increased incidence of squamous cell carcinoma of the bladder

Bladder lesions in urinary schistosomiasis

DIAGNOSIS

A definitive diagnosis of schistosomiasis can be made only by finding schistosome eggs in feces, urine, or a biopsy specimen, usually from the rectum The history of contact with contaminated water and clinical manifestations are important steps in establishing the diagnosis. Because schistosome eggs may be few, concentration by sedimentation should be employed. All eggs from the feces, urine, or tissues should be examined under high power to determine their viability by the activity of the cilia of the excretory flame cell of the enclosed miracidium. Dead eggs may persist for a long time after successful therapy or natural death of the worms Serologic tests are important in the diagnosis of acute infection because the symptoms are not .specific

TREATMENT

Praziquantel is the drug of choice for the treatment of schistosomiasis for four :reasons

High efficacy against all schistosome-1 .species and against cestodes

Lack of serious short-term and long-term-2 .side effects

.Administration as a single oral dose-3

.Competitive cost (cheep drug)-4

The standard recommended treatment consists of a single dose of 40 mg/kg for ***S. mansoni*** , ***S. hematobium***

PRAZIQUANTEL EFFECTIVE AGAINST TRAMATODES & CESTODES

Effective against

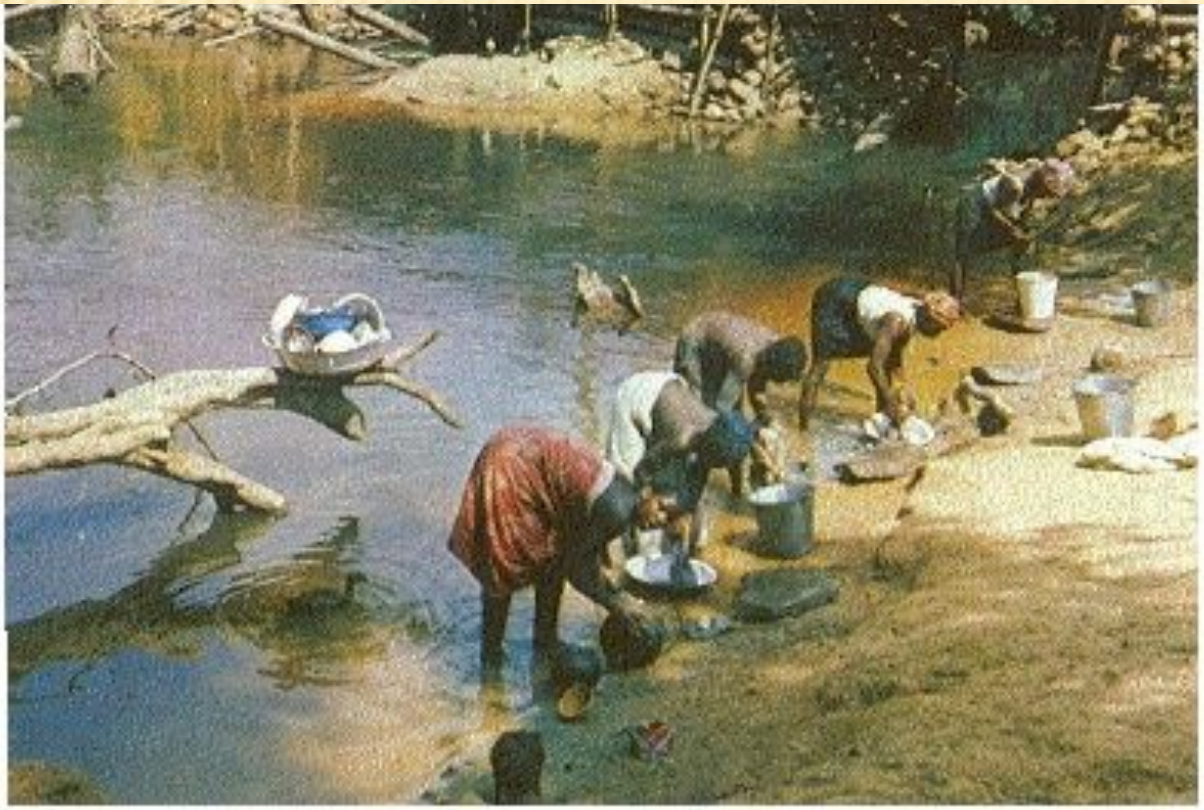
hydatid disease which caused by infection of various organs with larval stages of tapeworms of the genus Echinococcus

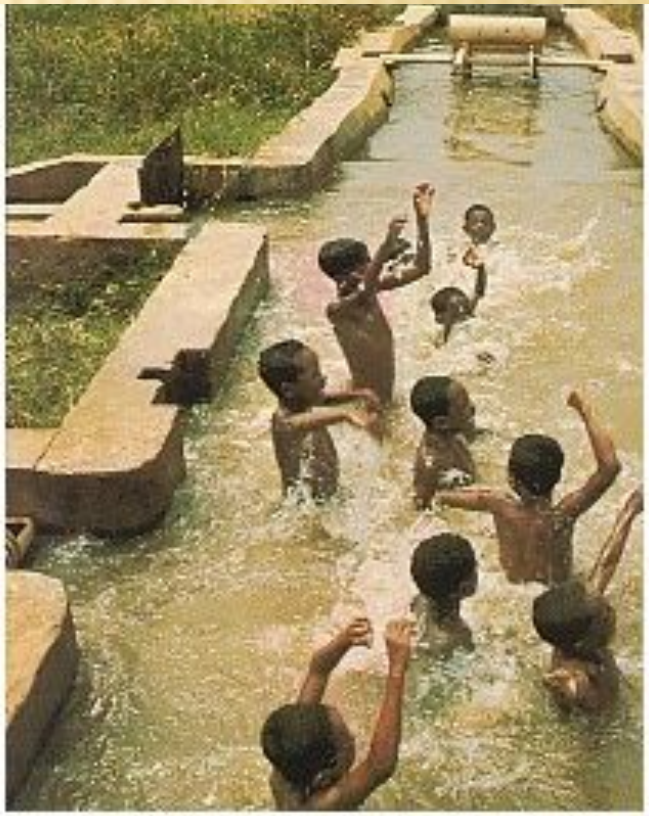
PREVENTION & CONTROL

- The basic means of preventing Schistosoma infection is avoiding contact with fresh water infested with Schistosome parasites.
- Swimming, wading, or any other aquatic activities in these bodies of water exposes the skin to possible penetration by the cercariae.
- Implementation of a national program that included chemotherapy and/or snail control as strategies for controlling the disease.

Avoiding contact with fresh water infested with Schistosome parasites.

But ,who prepares clean water & .chlorinated swimming pools for people





THANK YOU

المرحوم عبد الحليم حافظ يستنشق الأوكسجين في كواليس المسرح.