Trematodes

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Parasitology

Helminthes

*Trematodes (flukes)

* Nematodes (roundworms)

* Cestodes (tapeworms)

Trematodes (flukes)

* **Schistosomiasis (Blood Flukes)**

* **Fascioliasis (Hepatic flukes)**

* **Heterophes Heterophes (Intestinal Flukes)**

Schistosomiasis

* **It is a disease caused by *:***

- ***1)S.haematobium affecting urinary system***
- ***2)S.mansoni affecting intestine , liver and spleen***
- ***3) S. japonicum affecting the small intestine***

Clinical Picture

1) Stage of invasion:

- Cercarial dermatitis (within 24 hours then resolve)

- Eosinophilic pneumonitis(Cercarial pneumonitis): 4-6 weeks later. cough, high eosinophilia and eosinophils in the sputum

2) Stage of oviposition and granuloma formation :

Katayama syndrome (acute schistosomiasis)

1) fever : may persist for 4-6 weeks and may be investigated as a cause of pyrexia of unknown origin.

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2) Arthralgia and myalgia

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3) Tender hepatomegaly

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Diagnosis

1-H*yperoesinophilia*

2- serology high antibody titre of IgM type

Granuloma around Ova

**S. haematobium:*

urinary bladder , seminal vesicles and prostate leading to:

- *Dysuria*
- *Terminal haematuria*
- *Increased frequency*
- *precipitancy*
- *loin pain*
- *Haemospermia*

**Urine examination (presence of ova)*

**Semen examination (presence of ova) only if vas deferens , seminal vesicales or prostate are affected .*

S. Mansoni

- **colon (Mainly descending , sigmoid and rectum)*
- *-2 months from the time of exposure to infection in the form of :*
- *-Bouts of dysentery with tenesmus and mucus in stool.*
- *-Prolapse of anal mucosa due to tenesmus.*

Stage of Fibrosis

- **Replacement of granuloma by Massive fibrosis leading to all complications*
- **urinary system :*
- *Stricture ureters or urethra*
- *Ureteric stone due to stagnation + infection .*
- *-Urinary bladder lesions :*
- *Cystitis , Hypertrophy of the wall , Stones and cancer .*
- *Spermatic card and epididymis : Nodularity and thickening .*
- **In females : Vulva , Vagina , Uterus and tubes, ovaries may be affected however , it <u>doesn't cause infertility</u> .*

colon

- ***1 – colonic polyposis:***
- ***Covered with inflammed or ulcerated bleeding mucosa.***
- ***They are not adenomatous , So never turn malignant .***
- ***Accompanied by clubbing of fingers .***
- ***2 – Bilharzioma ; rare finding . It results from massive deposition of ova with extensive surrounding reaction leading to large mass felt in the descending colon and may be mistaken for Malignancy .***
- ***3 – Hepatosplenic Bilharziasis :***

Stages of Hepatosplenic Bilharziasis

A) Stage of hepatomegaly : •

B) Stage of hepatasplenomegaly : •

C) Stage of huge splenomegaly : •

D) Stage of hepatic encephalopathy and coma : •

Diagnosis

**A) Direct Methods :*

depend on the detcetion of ova in:

-Urine : smear , sedimentation , centrifugation .

-Stool : smear , sedimentation , concentration .

-Hatching technique :

This technique used for detection of the viability of ova in urine and stool by adding warm distilled water If viable swimming meracidia after 15 minutes .

- *Rectal snip* •

  Transparency •

  Histopathology •

-*Liver biopsy* •

Transparency •

Histopathology •

The direct methods may give false negative results as in the following conditions :

- ***1) Severe fibrosis closed infection (absence of ova in excreta inspite of active infection)***
- ***2) Mild infection small number of ova***
- ***3) Interrupted or incomplete treatment interrupted passage of ova***
- ***4) Aging of the worms stop ova passage***
- ***5) Direct methods may be not suitable for ectopic cases***
- ***6) Early infection (katayama fever) no ova excreted***

Serology

***Detection of Ag:**

***-circumoval precipitin test, urine precipitin test**

***or Ab in the serum**

***Complement fixation, immune flourescent antibody test**

Treatment

*Aims

1) To stop further deposition of ova thus preventing further tissue damage and enabling the existing lesion to regress

2) Interruption of life cycle decrease the transmission of infection

Praziquantel (Distocide)

**It's effective the 3 species of schistosomiasis , fasciola and cestoda .*

**Action : influx of Ca++, Na+ and outflux of k across the worm leading to Muscle contraction of the worm, immediate immobilization of the worm also it causes vacuolisation of Tegument . Egg formation by females is inhibited .*

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- **Dose : 40 mg /kg (tablet /15 kg b.w) in a single oral dose fractionated into 2 doses to be separated not more than 4 hours apart .*
- **The course can be repeated 2 or 3 times in moderate and severe infection .*

Side effects

- ***Usually mild and disappear within 24 hours***
- ***Epigastric pain***
- ***Nausea***
- ***Dizziness***
- ***Loose stool***
- ***Prurits***
- ***Fever***
- ***It's better to be avoided in pregnant women***
- ***Lactating women should stop lactation for 72 hours after drug***

Metrifonate

- *It's acholinestrase inhibitor*
- ** It's effective against s. haematobium only .*
- *10 mg /kg(Maximum 600 mg)*
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Sid effects

* ***Fatigue*** •

Muscular tremors •

Abdominal colic •

Diarrhea •

Vomiting •

Bronchospasm •

(Usually these side effects are mild and • ***transient)***

Oxamannquine

* ***Action : shift of parasite from the mesentery to liver within few days where male worms are retaind by tissue reaction and most of them die While the surviving unpaired females return to mesentery but don’t lay eggs .***

*It's effective against s. Mansoni only •

*20 mg /kg/day •

Side effects : •

Dizziness •

Headache •

Vomiting •

Diarrhea •

change in color of urine into orange red due to • excretion of it's metabolites . Fever may occur for 24-72 hours after completing the 3 days of treatment

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Other Trematodes

***Hepatic flukes (Fascioliasis):**

- ***It includes fasciola hepatica and fasciola gigantica***
- ***In Egypt , It's present in Alexandria and Kalioubya***
- ***Definite host: sheep, cattle and man***
- ***Mode of infection : Man is infected by eating contaminated water cress***

Manifestations of infection

It lives in the hepatobiliary system •

*A) Acute stage : * fever * pain * enlarged tender liver* •

B) Chronic stage : •

The ova start to appear in facces •

There may be hepatomegaly, cholangitis , cholecystitis and even stones with obstruction . •

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Diagnosis

*1) Detection of operculated ova in faeces and bile aspirate (140 X75 Um)

2) Serology as ELISA is useful if ova are absent in stool

3) Ultrasonography may show living worms and it's mobility within the bile passages

4) ERCP may show the tip of the worm protruding from CBD

Treatment

* *1) Bithional : is the drug of choice*
- *Dose : 30-50 mg/kg divided in 2 – 3 doses after meals on alternate days for 10 days*
- *Available forms : tablets each contain 200 mg*
- *Side effects : usually mild*
- *hypersensitivity * Leucopenia * diarrhea and abdominal pain*
- *2) Praziquantel : 25 mg/ kg t.ds for 3 successive days*
- *3) Dehydroemetine : 60 mg I.M for to days*
- *4) Triclobendazole (fasinex)*
- *It's used originally to treat animals*
- *Dose : 2.5gm once or twice*

II) Heterophes Heterophes

- **It's an intestinal fluke which lives deeply embedded between the villi of*
- *Small intestine .*
- *Metacercaria (infective stage) is encysted in fish muscles*
- *It's common in egypt in Demietta and borrollos*

Clinical picture

*1) Abdominal pain

2) Diarrhea with bloody stool (due to infection and ulceration of small intestinal mucosa)

N.B : The ova can migrate to any organ in the body .

Diagnosis

**ova in stool (oval shaped with an operculum at one end and knoblike thickening at the other)*

Treatment *: Praziquantel 25 mg/ kg t.d.s for 3 days .*

Cestodes

***I) Hydatid disease :**

- **Caused by Echinococcus granulosus**
- ***D.H : Intestine of dogs***
- ***I .H : Sheep and cattle***
- ***Man acts also as I . H when ingests food contaminated by eggs from stools of dogs . After ingestion, the egg embryo in small intestine and penetrate its wall ---- blood ----- tissues allover the body especially liver (50%), lungs (40 %) but <u>no organ is immune</u>***

*Pathology : *The cyst has 3 layers :*

1) Outer adventitial fibrous wall formed by the host

2) Thick intermediate layer secreted by the cyst

3) Inner germinal layer ---- broad capsules and daughter cyst

The cyst contains clear fluid with scolices, detached hooks and chalky

Granuls (Hydatid sand) it contains no albumin

Fate : 1) death ---- Inspissation and calcification

2) rupture

3) suppuration

clinical picture

- **depends on site and size of cyst .*
- *symptoms and signs are due to mechanical pressure and /or allergy caused by absorption of fluid.*
- *1) In liver : may form mass fluctuation and thrill D.D: cancer or huge abscess*
- *2) In lung : may cause collapse , mediastinal syndrome , haemoptysis*
- *3) In brain : symptoms of space occupying lesion especially hemiplegia or epilepsy*

Diagnosis

- *1) Clinical picture
- 2) blood picture ----oesinophilia
- 3) X – ray ---- cyst in lung or liver with definite outline calcification
- 4) Ultrasonography is very helpful especially in the liver
- 5) Serology : using either Ag from crude hydatid fluid or purified fluid or purified fluid or fraction Ag .
- Detection of Ab in serum either by ELISA or CFT

Treatment

A) Surgical treatment : •

B) Medical treatment : is unsatisfactory •

Mebendazole : 40 mg / kg/ day in 3 divided doses for 6 – 12 months •

Albendazole : better than mebendazole •

Given as 400 mg twice daily for 1 – 8 periods of 14 – 28 days •

C) Aspiration with or without Albendazole treament

**It was contraindcated because of risk of dissimination and anaphlaxis but nowadays it is done under u.s guidance using 7 mm needle for both diagnosis and treatment this is followed by injection of 95 % alchol or hypertonic saline*

Taenia saginata

***Treated by :**

- ***-Praziquantel ---- 25 mg /kg as single dose .***
- ***-Niclosamide (Yomesan)--- Adult dose is 1gm (2 tab) chewed ,followed after 2hours by anther 1gm It causes disintegration of the worm. food is given 2hours after the last dose***

Taenia solium

***Treated by :** •

praziquantel ---- 15 mg /kg t.ds for 10 – 14 days •

****If epilepsy occurs (in cysticercosis) --- antiepiletic drugs*** •

****If hydrocephalus occurs ---- surgery*** •

N . B. yomesan is contraindicated as it may cause cysticercosis •