DEPARTMENT OF PATHOLOGY

Rawalpindi Medical College

PARASITOLOGY

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PARASITOLOGY

Rules:
- Eat
- Not the person sitting next to you
- Drink
- Only permissible stuff
- Talk
- Only with me!

PARASITOLOGY

Scheme of Lectures:
- Helminths
  - Total of Eight Lectures
  - Flatworms
    - Cestodes → 5 lectures
    - Trematodes → 2 lectures
  - Nematodes → 4 Lectures
  - Intestinal Nematodes
  - Nematodes with disease causing larvae

PARASITOLOGY

How Will We Proceed:
- The Organism
- Introduction to Organism
- Life Cycle
- Clinical Features
- Diagnosis
- Summary
- Treatment
- Scenario/Clinical Correlation
- Challenge (reward??)
  - So pay attention.... 😊

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Rawalpindi Medical College
Scheme of Lectures:
- Helminths
  - Total of 8 Lectures
    - Flatworms
      - Cestodes (~2 lectures)
    - Nematodes
    - Ciliates
    - Arthropods
    - Echinococcus granulosus
  - Diphyllobothrium latum

Introduction
- Common Name: Dog Tapeworm
- Disease:
  - Hydatid Cyst Disease
  - Granuloma, a drop of Water
- The adult worm:
  - Jejunum and duodenum of dogs and other canines carnivores like Wolves, Foxes, etc.
  - Larval stage (hydatid cyst)
  - Humans and herbivorous animals (sheep, goats, cattle, and horse)
- Humans:
  - May live up to 30 years

Morphology:
- Adult Worm:
  - 3–6 mm in size
  - Smaller than other tapeworms
  - Scales, a short neck, and strobila

Morphology:
- Adult Worm:
  - Strobila:
    - Only 3 Proglottids
    - Immature (rostellum)
    - Mature (strobila)
    - Gross (-distal)
  - Scales:
    - Pyriform shape
    - 4 suckers
    - Posterior with 2 rows of hooks
Clinical Features:
- Most of the times infection is asymptomatic and accidentally discovered.
- Clinical disease develops only when the hydatid cyst has grown big enough to cause obstructive symptoms.
- Disease results mainly from pressure effects caused by the enlarging cyst.
- Liver > Lungs > Kidneys > Brain > Spleen etc.
- Anaphylaxis!!!
NEXT LECTURE:
- Helminths
- Trematodes
- Schistosoma

Give your valuable feedback with "FILES"
http://goo.gl/TqGVWv

DEPARTMENT OF PATHOLOGY

RAWALPINDI MEDICAL COLLEGE
**Parasitology**

**Diagnosis**
- Imaging studies
- Serological Antigen - Antibody Detection
- Cason's intradermal test
- Eosinophilia (20-25%)

**Treatment**
- Surgical resection/excision of Cysts
- Albendazole & Mebendazole
  - Either in combination or separately
  - Mostly useful post-operatively
  - Not curative
  - May be given for months to years or life long

**Parasitology**

**Cestodes**
- Diphyllobothrium latum

**Introduction**
- Common Name: Fish Tapeworm
- Largest of Cestodes
  - Up to 45 meters long
  - Infection from eating raw or undercooked fish
  - Small intestine (ileum) in humans
  - May Live Up to 10 Yrs.

**Morphology**
- Adult Worms:
  - Scolex:
    - Spatulate or spoon-shaped
    - 2-0 mm long and 1 mm broad
    - 2 sets of longitudinal suckling grooves (bothria)
    - Lack true suckers and hooks
  - Neck
Morphology

- Eggs:
  - Identical to T. equi
  - No diagnostic significance

Morphology

- Larval form:
  - Found within the hydatid cyst developing inside various organs at the intermediate host
  - Represents the structure at the scales of adult worm and remains evaginated within a vesicular body
  - After entering the definitive host at human body, the scales with succus and hooklets, becomes evaginated and develops into adult worm
Clinical Features
- Asymptomatic to Mechanical Obstruction in advanced cases
- Abdominal discomfort
- Diarrhea
- Nausea
- Weight Loss
- Pernicious Anemia $\rightarrow$ VE $B_{12}$ Deficiency.

Diagnosis
- Stool Examination for
  - Eggs
  - Proglottids
- Coproantigen Detection Test
  - Usually not done as stool examination for eggs is sufficient.

Treatment
- Single dose of Praziquantel
- 10 mg/kg body weight.

Scenario
- A 30 year old male, having severe anemia and numbness of extremities presented in OPD. He is fond of Sushi for last many years. The stool examination shows large oval, thick-walled eggs with an operculum at one end. What is your diagnosis?

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Challenge...
Interpret & Answer
- For Casoni's Test, how do we sterilize the Hydatid Fluid?
**Morphology**
- Adult Worm:
  - Nodule
    - 3,000-4,000 prelarvae
  - Hermaphrodite
  - Sixteen ova and a Rosette-like lesion in the medulla
  - Fertilized ova are discharged

**Morphology**
- Egg:
  - Serous egg layer... up to 1 million eggs per day!

**Morphology**
- Egg:
  - Ovoid
  - Thick brown shell
  - Operculum at one end and a small knob at the other
  - The freshly passed egg contains an immature embryo surrounded by yolk granules
  - Not infective to humans

**Morphology**
- Larvae:
  - Three larval stages:
    - First stage larva
    - Second stage larva
    - Third stage larva

**Life Cycle**
- Definitive Host:
  - Humans, Dog, Cat... Humans are the best!
- Hosts for Larval Stages:
  - Intermediate Host:
    - First stage larva (Coracidium)
      - Freshwater copepods e.g. Cyclops
  - Second stage larva (Procercoid)
    - Freshwater fish e.g. Salmon
  - Definitive Host:
    - Third stage larva (Fiehocercoid)
    - Infective to man

**LIFE CYCLE OF Dracunculus medinensis**