

**JABATAN PARASITOLOGI
FAKULTI PERUBATAN
UNIVERSITI MALAYA**

'LECTURE GUIDELINES'
UNTUK BLOK "*PARACLINICAL CORE*"
DAN BLOK SISTEM

**MBBS FASA II
SESI 2011/2012**

Topic/Title : INTRODUCTION TO PARASITOLOGY

Lecture : 1 hour

- I. Course contents :
- Protozoology
 - Helminthology (Nematodes, Trematodes, Cestodes)
 - Medical Entomology & venomous animals including snakes

II. Objectives of Paraclinical Core:

- To know :
- Distribution of parasites
 - Location in host
 - Basic morphology (of diagnostic stages)
 - Basic life cycle - routes of infection
 - infective stages
 - modes of transmission
 - Epidemiology - prevalence
 - distribution of infection
 - rates of infection and re-infection
 - Signs and symptoms
 - Laboratory diagnosis
 - Treatment
 - Prevention and control

III. Methods of Teaching - Lecture

- PBL
- Practical, Questions and Answer sessions

Methods of assessment - MCQs

- SAT, Scenarios
- Practical (OSPE)

- IV. Definitions :
- a) Types of parasites
- Ectoparasite
 - Endoparasite
 - Obligate
 - Facultative
 - Incidental/accidental
 - Aberrant and
 - Spurious parasite
- b) Types of hosts
- Final or definitive host
 - Intermediate host
 - Vectors - biological
 - mechanical
 - Reservoir host
 - Paratenic or transport host
- c) Common sources of infection
- d) Modes of entry
- e) Types of infection
- f) Types of parasite life cycles

Topic/Title : INTESTINAL PROTOZOA I - INTRODUCTION TO PROTOZOA

Lecture : 1 hour

I. Protozoa of Medical Importance

- *Entamoeba histolytica* : Aspects on:
 - distribution
 - epidemiology
 - hosts
 - morphology
 - mode of infection
 - life cycle
 - extraintestinal sites
 - requirements of amoeba to establish colonization
 - signs, symptoms and complications
 - diagnosis
 - control

- *Entamoeba coli* - to distinguish from *E. histolytica* especially for diagnosis

- ### II. Other Intestinal Amoeba
- *E. gingivalis* (mouth)
 - *Iodamoeba butschlii*
 - *Dientamoeba fragilis*

- ### III. Free Living Amoebae
- *Naegleria*
 - *Acanthamoeba*

Aspects on :

- Distribution
- Morphology
- Mode of infection
- Life cycle
- Signs and symptoms
- Diagnosis
- Control

Topic/Title : INTESTINAL PROTOZOA II & OTHER PROTOZOANS

Lecture : 1 hour

I. Flagellates - *Giardia lamblia*
- *Trichomonas vaginalis* (urogenital flagellate)

II. Ciliate - *Balantidium coli*

III. Emerging faecal pathogens

Blastocystis hominis

Isospora

Cyclospora

Microsporidium

Cryptosporidium

Aspects on :

- Distribution
- Epidemiology
- Habitat
- Morphology
- Source of infection
- Life cycle
- Signs and symptoms
- Diagnosis
- Control

Topic/Title : BLOOD PROTOZOA I

Lecture : 1 hour

Blood Protozoa I

Malaria in man

- *Plasmodium vivax* (benign tertian, 48hr fever)
- *Plasmodium falciparum* (malignant tertian, pernicious, 48hr fever)
- *Plasmodium malariae* (Quartan malaria)
- *Plasmodium ovale* (Ovale tertian)
- *Plasmodium knowlesi* (simian malaria)

Aspects on :

- Epidemiology of malaria
- Vector ecology
- Life cycle – in man and vector
- Morphology
- Differential diagnosis of malaria parasites
- Pathogenesis of malaria
- Recrudescence and relapse

Topic/Title : BLOOD PROTOZOA II

Lecture : 1 hour

Blood Protozoa II (Continuation)

Aspects on :

- Clinical manifestations and complications
- Immunity to malaria
- Diagnosis
- Treatment
 - Antimalarial drugs.
- Drug resistance in malaria
 - Definition
 - Types of resistance
- Prevention and control

Babesia spp.

There are two species reported in man

1. *Babesia bovis*
2. *Babesia microti*

Aspects on :

- Epidemiology
- Life cycle
- Morphology
- Clinical manifestations
- Diagnosis
- Treatment
- Prevention and control

Topic/Title : TISSUE PROTOZOA 1

Lecture : 1 hour

1. *Leishmania donovani*
2. *Leishmania tropica*
3. *Leishmania braziliensis*
4. *Trypanosoma gambiense*
5. *Trypanosoma rhodesiense*
6. *Trypanosoma cruzi*

Aspects on :

- Geographical distribution
- Epidemiology
- Morphology
- Life cycle – in man and vector
- Clinical features
- Diagnosis - laboratory and clinical
- Treatment
- Prevention

Topic/Title : TISSUE PROTOZOA II

Lecture : 1 hour

Toxoplasma gondii

Sarcocystis spp.

Aspects on :

- Geographical distribution
- Life-cycle
- Morphology
- Epidemiology - Sources of infection
 - Modes of transmission
 - Prevalence of infection
 - Distribution according to age, race, sex and types of communities
 - Current situation in Malaysia
- Clinical features
- Diagnosis - laboratory & clinical
- Treatment
- Prevention and control

Topic/Title : **INTESTINAL NEMATODES I, II & III**
(Soil-transmitted helminths)

Lecture : 3 hours

- I - General introduction to nematodes
 Ascaris lumbricoides, Enterobius vermicularis
- II - Hookworm and *Strongyloides stercoralis*
- III - *Trichuris trichiura, Trichinella spiralis, Capillaria philippinensis, C. hepatica*

Aspects on :

- Distribution
- Location in host
- Basic morphology of :
 - diagnostic stage, infective stage and adult
- Life cycle
 - routes of infection
 - modes of transmission
 - life span of adult worms
 - egg-laying capacity
 - incubation period in man
 - development in soil
 - autoinfection/hyperinfection
- Clinical signs and symptoms
- Epidemiology
 - local prevalence
 - distribution according to age, race, sex and communities
- Methods of laboratory diagnosis
- Prevention and control
- Treatment
 - Drugs of choice, names of drugs only

Topic/Title : FILARIAL WORMS I

Lecture : 1 hour

- Common species and strains of filarial parasites causing Malayan and Bancroftian filariasis.
- Microfilarial periodicity
 - definition
 - types of periodicity
 - periodic
 - subperiodic
 - nocturnal
 - diurnal
- General life cycle of filarial worms
 - diagnostic stage
 - intrinsic incubation period
 - infective stage
 - stage that causes pathology
- Morphological identification - characteristics of microfilaria of *Wuchereria* and *Brugia* spp.
- Epidemiology and transmission of Malayan and Bancroftian filariasis
 - distribution and ecotypes
 - vector species and habitats
 - reservoir host
- Clinical features
- Laboratory diagnosis
 - fresh blood
 - stained thick blood smear
 - concentration techniques
 - serological tests
- Prevention and control of filariasis
 - mass and targeted chemotherapy
 - vector control
 - treatment

Topic/Title : FILARIAL WORMS II

Lecture : 1 hour

I. *Onchocerca volvulus*

- Parasite habitat
- Geographical distribution
- Basic morphology of parasite for identification
- Life cycle and biology of parasite
- Epidemiology and vectors
- Clinical features
- Laboratory diagnosis
- Control and prevention of onchocerciasis

II. Other filarial infections

Loa loa
Mansonella spp. } discussion on similar lines as *Onchocerca volvulus*

Topic/Title : TISSUE NEMATODES

Lecture : 1 hour

- Introduction : - *Toxocara canis, T. cati* (causing visceral larva migrans)
- *Ancylostoma braziliense, A. caninum, *Uncinaria stenocephala, *Bunostomum phlebotomum* (causing cutaneous larva migrans)
- **Gnathostoma spinigerum* (causing larva migrans)
- **Angiostrongylus cantonensis*, (causing angiostrongyliasis)
- *Dirofilaria sp.*

Aspects on :

- Geographical distribution
- Disease features (brief)
- Location in host
- Morphology
- Life cycle
 - infective stage
 - routes of infection
 - modes of transmission
 - life span of adults
- Epidemiology
- Diagnosis
- Treatment
- Prevention and control

* To discuss briefly.

Topic/Title : TREMATODES I & II

Lecture : 2 hours

Includes all flukes of Medical Importance

- General characteristics of flukes
 - Intestinal flukes
 - *Fasciolopsis buski*
 - *Metagonimus yokogawai*
 - *Heterophyes heterophyes*
 - *Gastrodiscoides hominis*
 - *Echinostoma ilocanum*
 - Liver flukes
 - *Clonorchis sinensis*
 - *Opisthorchis viverrini*
 - *Fasciola hepatica*
 - *Fasciola gigantica*
 - *Dicrocoelium dendriticum*
 - Lung fluke
 - *Paragonimus westermani*
 - Blood flukes
 - *Schistosoma japonicum*
 - *S. mansoni*
 - *S. haematobium*
 - *S. malayensis*
 - Animal schistosomes - to discuss briefly
- Trematodes I**
- Trematodes II**

Aspects on :

- Distribution
- Location in host
- Morphology
- Life cycle
- Epidemiology
- Signs and symptoms
- Laboratory diagnosis
- Treatment
- Prevention

Topic/Title : CESTODES I

Lecture : 1 hour

- Introduction - General characteristics of cestode
- Tape worms - *Taenia saginata*
 - *Taenia solium* & *Cysticercus cellulosae*
 - *Hymenolepis nana*
 - *Hymenolepis diminuta*

Aspects on :

- Geographical distribution
- Habitat in host
- Morphology
 - adult
 - egg
 - larval stage
- Transmission to man
- Life cycle in man
 - infective stage
 - definitive host
 - intermediate host
- Epidemiology
- Clinical features
- Diagnosis
- Treatment
- Prevention

Topic/Title : CESTODES II

Lecture : 1 hour

Other cestodes

Echinococcus granulosus, E. multilocularis
Multiceps multiceps
Dipylidium caninum
Diphyllobothrium latum
Spirometra spp.

Aspects on :

- Geographical distribution
- Habitat in host
- Morphology
- Life cycle
- Epidemiology
- Clinical features
- Diagnosis
- Treatment
- Prevention

Topic/Title : INTRODUCTION TO MEDICAL ENTOMOLOGY – DIPTERANS

Lecture : 1 hour

- Definition of medical entomology
- Introduction to arthropods
- Methods of disease transmission
 - mechanical
 - cyclical
 - transovarial
 - insect – man contact
- Brief notes on Insecta / Orders
- Medical importance of Arthropods
- Medical importance of Dipterans
- Dipterans causing myiasis

Topic/Title : MOSQUITOES

Lecture : 1 hour

- Introduction to Mosquitoes.
 - General Morphology
 - adults
 - eggs
 - larvae
 - pupae
 - Life Cycle
- Classification of medically important mosquitoes:
 - Genus *Anopheles*
 - Genus *Culex*
 - Genus *Mansonia*
 - Genus *Aedes*
- Vector of diseases:
 - Malaria
 - Filariasis
 - Dengue
 - Dengue hemorrhagic fever
 - Encephalitis
- Vector control
- Epidemiology

Topic/Title : ECTOPARASITES AND ACARINES

Lecture : 1 hour

Introduction : - Definition of ectoparasites

- Major classification
 - insecta (lice, fleas, bugs)
 - arachnida (ticks, mites)

Aspects on :

- Important species under each classification
- Epidemiology
- General morphological features
- Life cycle
- Location in host
- Medical importance of ectoparasites & acarines
- Disease caused, transmission and clinical features (brief)
- Diagnosis and identification
- Treatment
- Prevention and control

Topic/Title : SNAKES, POISONOUS & VENOMOUS ANIMALS

Lecture : 1 hour

Snakes

Aspects on :

- Characteristics of snakes
- Types of snakes - venomous and non venomous
- Identification of snakes
- Types of snake venoms and their effect
- Epidemiology of snake bites
- First Aid treatment to snake bites and hospital treatment.

Introduction to venomous arthropods and other animals.

Medical importance of venomous arthropod and other animals

Topic/Title : VECTOR CONTROL

Lecture : 1 hour

Objectives – to know the methods of vector control and the aims of vector control

Definitions

Biological vectors

Mechanical vectors

Methods of control:

- Traps
- Environmental modification
- Insecticides (adulticides/larvicides)
- Biological control
- Genetic modification
- Integrated control

Advantages and disadvantages of the above methods and current situation in Malaysia.

Topic/Title : HOST-PARASITE RELATIONSHIP

Lecture : 1 hour

- Objectives
- to know modes of entry of parasite into host
 - to know modes of transmission and exit of parasite from host
 - to know the location of parasite within host
 - to know ways of prevention and control

- Modes of entry into host
 - mouth
 - skin
 - intermediate hosts
 - vectors
 - others

- Location of parasite within host
 - specific
 - non-specific

- Ecological niche :
 - host as an environment
 - Developmental stimuli
 - source of nutrients
 - means of exit

 - modes of transmission
 - direct life cycles
 - indirect life cycles

- Ways to prevent
 - entry of parasite into hosts
 - establishment of infection in host
 - exit of parasite from host

Topic/Title : ZOONOSIS

Lecture : 1 hour

Objective : To understand the importance of zoonotic infection to man

- Definition of zoonosis
- Classification by
 - direction of transmission
 - types of life cycles
- Characteristics of zoonotic infections (Essential Features of Zoonosis)
- Brief discussion on pertinent features, transmission and ecology of some important zoonotic infections:
 - a) yellow fever
 - b) typhus
 - c) simian malaria
 - d) babesiosis
 - e) sub-periodic Malayan filariasis
 - f) dirofilariasis
 - g) Malaysian schistosomiasis
 - h) trichinosis
- Factors contributing to increasing importance of zoonosis
- Ways of transmission of zoonotic infections (eg. ova, cysts etc)
- Why is zoonosis important?
- Factors influencing prevalence
- Groups of people prone to zoonotic infections
- Control of zoonotic infections

OBJECTIVES OF SYSTEM LECTURES IN PARASITOLOGY :

1. To know the parasitic diseases affecting a particular system.
2. To know the pathogenesis and to be able to recognize the clinical manifestations of these parasitic infections.
3. To be able to diagnose the parasitic infections and institute measures of management.
4. To be able to know the social and preventive measures for these parasitic infections.

Topic/Title : PARASITIC INFECTIONS OF CVS

Lecture : 1 hour

1. Diffuse myocarditis:
 - Chagas' disease – *Trypanosoma cruzi*.
 - African trypanosomiasis – *Trypanosoma b. rhodesiense*.
Trypanosoma b. gambiense.
 - Toxoplasmosis – *Toxoplasma gondii*.
 - Trichinosis – *Trichinella spiralis*.
 - Sarcocystosis – *Sarcocystis lindemanni*.

2. Pulmonary hypertension:
 - Schistosomiasis – *Schistosoma haematobium*
 - Filariasis

3. Anaemic heart disease:
 - Hookworm

4. Pericarditis and pericardial effusion:
 - Amoebiasis – *Entamoeba histolytica*
 - Trypanosomiasis - *T. cruzi*
- *T. b. rhodesiense*

5. Focal myocardial lesions:
 - Hydatid cysts – *Echinococcus granulosus*
 - Cysticercosis – *Cysticercus cellulosae*
 - Heterophyiasis – *Heterophyes heterophyes*

Aspects on :

- Pathogenesis
- Clinical manifestations
- Diagnosis
- Treatment/Control

Topic/Title : PARASITIC INFECTIONS OF RESPIRATORY SYSTEM I & II

Lecture : 1 hour

Respiratory System I

- | | | | |
|----|----------------------------------|---|--|
| 1. | <i>Entamoeba histolytica</i> | - | focal lesion in lung parenchyma |
| | | - | pulmonary amoebiasis secondary to liver abscess |
| 2. | <i>Leishmania donovani</i> | - | presence of reticulo endothelial infiltration within the interstitial lung tissue |
| 3. | <i>Toxoplasma gondii</i> | - | pneumonitis seen in disseminated toxoplasmosis |
| 4. | <i>Ascaris lumbricoides</i> | } | larval nematodes producing Loeffler's syndrome |
| 5. | Hookworm | | |
| 6. | <i>Strongyloides stercoralis</i> | | |
| 7. | <i>Wuchereria bancrofti</i> | } | diffuse filarial lung diseases giving rise to occult filariasis or Tropical pulmonary eosinophilia |
| 8. | <i>Brugia malayi</i> | | |

Aspects on :

- Etiology of disease
- Pathogenesis
- Clinical features
- Diagnosis
- Treatment/Control

Lecture : 1 hour

Respiratory System II

1. *Dirofilaria* - focal pulmonary filariasis
on X-rays it appears as coin lesions
2. *Toxocara* sp. - visceral larval migrans giving rise to pneumonitis
3. *Paragonimus* sp.
4. *Schistosoma japonicum*
Schistosoma mansoni
Schistosoma haematobium } pneumonitis is part of the systemic illness (Katayama syndrome)
pseudotubercle caused by eggs
5. Hydatid cyst - larval cestode causing focal lesion in lung parenchyma
6. *Cysticercus cellulosae* - larval cestode of *T. solium* causing focal lesion in lung parenchyma
7. (Allergenic mites in house dust)
Dermatophagoides sp. - causing allergic rhinitis and asthma in sensitive patients.

Aspects on :

- Pathogenesis
- Clinical features
- Diagnosis
- Treatment / Control

Topic/Title : PARASITIC INFECTIONS OF THE GIT I & II

Lecture : 2 hours

Clinical Presentations

- 1) Pruritus ani
 - *Enterobius vermicularis*
 - *Taenia saginata*
 - *Strongyloides stercoralis*
 - *Hymenolepis nana*
 - *Dipylidium caninum*
- 2) Acute gastroenteritis
 - *Trichinella spiralis*
- 3) Dysentery
 - *Entamoeba histolytica*
 - *Balantidium coli*
 - *Trichuris trichiura*
 - *Strongyloides stercoralis* (Hyperinfection)
 - *Schistosoma mansoni*; *S. japonicum*
- 4) Malabsorption syndrome
 - *Giardia lamblia*
 - *Isospora belli*
 - *Cryptosporidium*
 - *Strongyloides stercoralis*
 - *Capillaria philippinensis*
- 5) Megasyndrome
 - *T. cruzi* (Chronic Chagas' Disease)
- 6) Acute abdomen
- 7) Non Acute Abdominal Pain
- 8) Simple Diarrhoea
- 9) Non Specific Gastrointestinal Disturbance

Aspects on :

- Pathogenesis
- Clinical features
- Diagnosis
- Treatment / Control

Topic/Title : PARASITIC INFECTIONS OF THE HEPATOBILIARY SYSTEM I & II

Lecture : 2 hours

PROTOZOANS OF LIVER AND PATHOLOGICAL TYPES

1. Space occupying lesions in liver parenchyma
 - *Entamoeba histolytica*
2. Intracellular sinusoidal hepatocytes (Kupffer Cells)
 - *Plasmodium falciparum*
 - *Leishmania donovani*
 - *Toxoplasma gondii*

HELMINTHS OF HEPATOBILIARY SYSTEM

1. Lumen of biliary tracts
 - *Clonorchis sinensis*
 - *Opisthorchis viverrini*
 - *Fasciola hepatica*
 - *Dicrocoelium dendriticum*
 - *Ascaris lumbricoides*
2. Eggs granuloma and fibrosis
 - *Schistosoma japonicum*
 - *S. haematobium*
 - *S. mansoni*
 - *S. mekongi*
 - *Capillaria hepatica*
3. Larval migration
 - *Toxocara canis*
 - *Strongyloides stercoralis*
 - *Gnathostoma spinigerum*
4. Space occupying lesion
 - *Echinococcus granulosus*
 - *E. multilocularis*

The following aspects for each parasites will be discussed:

- Etiology of disease
- Pathogenesis
- Clinical features
- Diagnosis
- Epidemiology and Control
- Treatment

Topic/Title : PARASITIC DISEASES ASSOCIATED WITH THE HAEMOPOIETIC SYSTEM

Lecture : 1 hour

- Mechanisms leading to anaemia
- Parasitic diseases associated with Anaemia
 - 1) Hookworm anaemia
 - 2) Trichuriasis
 - 3) Schistosomiasis
 - 4) Diphyllbothriasis
 - 5) Amoebiasis
 - 6) Malaria
 - 7) Visceral leishmaniasis
 - 8) Trypanosomiasis

Aspects on :

- Pathogenesis
 - The type and onset of anaemia
 - Symptoms of anaemia
 - Diagnosis
 - Treatment
-
- Basic investigations
 - Physical Signs seen in anaemia
 - Parasitic diseases associated with eosinophilia
 - Clinical significance of eosinophilia

Topic/Title : PARASITIC INFECTIONS OF THE RETICULOENDOTHELIAL SYSTEM

Lecture : 1 hour

System includes: spleen, liver, bone-marrow and lymph nodes

Parasitic Diseases:

- Malaria
- Toxoplasmosis
- American trypanosomiasis
- African trypanosomiasis
- Visceral leishmaniasis
- Schistosomiasis

(The spleen is a major site for the development and effective function of immunity in a variety of parasitic diseases, so major subject considerations would be concentrated on this organ. Splenomegaly is an important clinical sign in parasitic disease).

- Malaria splenomegaly
- Tropical splenomegaly syndrome
- Splenic cysts/granulomas – space occupying disease

Aspects on :

- Pathogenesis of splenomegaly
- Clinical features
- Diagnosis
- Treatment

Topic/Title : PARASITIC INFECTION OF THE LYMPHATIC SYSTEM

Lecture : 1 hour

Parasitic diseases associated with the system:

- Lymphatic filariasis
- Toxoplasmosis
- American trypanosomiasis
- African trypanosomiasis
- Visceral leishmaniasis

Aspects on :

- Epidemiology
- Clinical manifestations (Acute/Chronic phases)
- Pathogenesis
- Diagnosis
- Treatment

Topic/Title : PARASITIC INFECTIONS OF THE RENAL SYSTEM

Lecture : 1 hour

Parasitic diseases associated with the system:

- Urinary schistosomiasis – *Schistosoma haematobium*
- Genital filariasis – *Wuchereria bancrofti*
- Acute renal failure – *Plasmodium falciparum* & *Babesia* spp.
- Black water fever – *Plasmodium falciparum*
- Nephrotic syndrome – *Plasmodium malariae* (commonly seen)
Others: *Schistosoma haematobium*
Toxoplasma gondii
Trypanosoma cruzi, *T. b. rhodesiense*
- Genital ulceration – *Entamoeba histolytica*
- Vulvo-vaginitis – *Trichomonas vaginalis*
Enterobius vermicularis
- Urogenital myiasis - Flies

Aspects on :

- Etiology of disease
- Pathogenesis
- Clinical manifestations
- Diagnosis
- Treatment

Topic/Title : PARASITIC INFECTIONS IN PREGNANCY AND THE NEWBORN

Lecture : 1 hour

List of parasitic infections : Protozoan infections :

- Malaria
- Toxoplasmosis
- Amoebiasis
- Giardiasis
- Trichomoniasis
- African trypanosomiasis
- American trypanosomiasis

Helminthic infections :

- Trichinosis
- Schistosomiasis

Effect of each disease on :

- Pregnant mother
- Foetus
- Newborn

Aspects on :

- Pathogenesis
- Clinical manifestations
- Diagnosis
- Treatment

Academic emphasis is more on parasites found in Malaysia.

Topic/Title : CNS I - PARASITES THAT CAUSE LESIONS IN THE CNS

Lecture : 1 hour

- Acute encephalopathy
 1. Cerebral malaria - *Plasmodium falciparum*
 2. Trypanosomiasis - *Trypanosoma cruzi*
- *T. rhodesiense*
 3. Toxoplasmosis - *Toxoplasma gondii*
 4. Trichinosis - *Trichinella spiralis*
- Chronic encephalopathy
 1. African trypanosomiasis - *Trypanosoma gambiense*
 2. Congenital toxoplasmosis
- Focal and space-occupying lesions
 1. Larval cestodes - *Cysticercus cellulosae* (larva of *Taenia solium*)
- Hydatid cyst (larva of *Echinococcus granulosus*)
 2. Ectopic trematodes - *Paragonimus westermani*
- *Schistosoma* spp.
- *Heterophyes heterophyes*
- *Fasciola hepatica*
 3. Migrating nematodes - *Toxocara*
- *Loa loa*
 4. Amoebic brain abscess - *Entamoeba histolytica*
- Meningitis
 1. *Angiostrongylus cantonensis* (migrating nematode)
 2. Primary amoebic meningoencephalitis - *Naegleria fowleri*
- *Acanthamoeba* spp.
- Tick paralysis

Aspects on :

- Pathogenesis
- clinical manifestations
- Diagnosis
- Treatment

Topic/Title : CNS II - PARASITES THAT CAUSE LESIONS IN THE EYE

Lecture : 1 hour

- Onchocerciasis - *Onchocerca volvulus*
- Choroidoretinitis -
 1. Toxoplasmosis (*Toxoplasma gondii*)
 2. Toxocariasis (*Toxocara* spp.)
- Space-occupying lesions – larval cestodes
 1. *Cysticercus cellulosae* (larva of *Taenia solium*)
 2. Hydatid cyst
- Orbital oedema and cellulitis
 1. American trypanosomiasis (*T. cruzi*)
 2. Trichinosis – *Trichinella spiralis*
 3. Loiasis – *Loa loa*
 4. Sparganosis – *Spirometra* spp.
 5. Myiasis
 6. Larval cestodes
 - Hydatid cyst
 7. *Dirofilaria immitis*
- Keratitis – *Acanthamoeba* spp.

Aspects on:

- Pathogenesis
- Clinical manifestations
- Diagnosis
- Treatment

Topic/Title : PARASITIC INFECTIONS OF THE MUSCULOSKELETAL SYSTEM

Lecture : 1 hour

MUSCLE

- Disease :
 - Toxoplasmosis
 - Sarcocystosis
 - Trichinosis
 - Cysticercosis

BONE

- Disease :
 - Hydatid disease

JOINT

- Disease :
 - Dracunculiasis

Aspects on:

- Pathogenesis
- Clinical manifestations
- Diagnosis
- Treatment

Topic/Title : IMMUNOLOGY OF PARASITIC INFECTIONS

Lecture : 1 hour

- Factors that determine immune response

- Immune response to protozoan diseases
 - amoebiasis
 - giardiasis
 - African trypanosomiasis
 - American trypanosomiasis
 - leishmaniasis - mucocutaneous
 - visceral
 - malaria
 - toxoplasmosis

- Immune response to helminthic diseases
 - schistosomiasis
 - taeniasis
 - cysticercosis
 - hydatid disease
 - ascariasis
 - trichinosis
 - filariasis - lymphatic
 - non-lymphatic

Topic/Title : PARASITIC INFECTIONS IN AIDS PATIENTS

Lecture : 1 hour

- **Definitions**
 - HIV (Human Immunodeficiency Virus)
 - AIDS (Acquired Immunodeficiency Syndrome)
 - OI (Opportunistic Infections)

- **Epidemiology**

Opportunistic parasitic infections/diseases in Malaysia, Southeast Asia and worldwide

- **List of AIDS-defining illnesses for parasites according to CDC, Atlanta, 1993**
 - Toxoplasmosis in the brain
 - Cryptosporidiosis
 - Isosporidiosis

Aspects on:

- Pathogenesis
- Clinical manifestations
- Diagnosis
- Treatment
- Current situation in terms of
 Prophylaxis
 The role of highly active anti-retroviral therapy (HAART)

Topic/Title : PARASITIC INFECTIONS OF THE SKIN

Lecture : 1½ hours

Introduction

Protozoan infection

- * Cutaneous amoebiasis - *Entamoeba histolytica*
- Trypanosomiasis - trypanosomal chancre (*Trypanosoma brucei*); chagoma (*T. cruzi*)
- * Cutaneous leishmaniasis
- Visceral dermal leishmaniasis

Helminthic infection

Trematode infection

- Cutaneous schistosomiasis – *S. japonicum*, *S. mansoni*, *S. haematobium*
- Cercarial dermatitis - non human schistosomes

Nematode infection

- * Strongyloidiasis – larva currens
- * Cutaneous larva migrans
- Gnathostomiasis – *Gnathostoma spinigerum*

- Onchocerciasis }
• Loiasis } filarial worm infection
• Dracunculiasis }

Minor/rare skin infections (brief)

- Dirofilariasis
- Dipetalomeniasis
- Sparganosis
- Echinococcosis (hydatid disease)
- Cysticercosis
- Enterobiasis
- Hookworm infection

Insects

- * Lice – Pediculosis, phthiriasis
- Fleas – papular urticarial lesions; tungiasis
- Bugs
- Flies - cutaneous myiasis

Acarines

- Ticks – hard (ixodid) ticks; soft (argasid) ticks
- Mites – Hair follicle mite; family Trombiculidae (scrub typhus)
 - *Sarcoptes scabiei* (Scabies)*

Parasitic infections marked (*) will be covered in detail:

- Signs and symptoms
- Pathogenesis
- Diagnosis
- Treatment
- Prevention and control