FOUNDATION MODULE 2

HANDBOOK

FACULTY OF MEDICINE

UNIVERSITY OF COLOMBO

A/L 2017

FOUNDATION MODULE 2

WELCOME MESSAGE

Dear Students,

Welcome to the Foundation Module 2. Why should you learn about Microbiology and Parasitology?

An increase in the population movement, expansion of international trade in food items and medicinal biological products, social and environmental changes linked to urbanization, and deforestation are all manifestations of the rapidly-changing nature of the world we live in. The rapid adaptation of microorganisms has facilitated the return of old communicable diseases and the emergence of new ones. Due to the evolution of antimicrobial resistance, curative treatment for a wide range of parasitic, bacterial, viral and fungal infections have become less effective. The occurrence of a communicable disease in one country, becomes a concern for all.

In addition, many developing countries continue to battle with health issues such as pneumonia, diarrhoea and malaria. In low-income countries less than one in five of all people reach the age of 70, and more than a third of all deaths are among children under 15 years. People predominantly die of infectious diseases such as lung infections, diarrhoeal diseases, HIV/AIDS,

tuberculosis, and malaria. which are most likely to kill children under the age of five.

Microbiology and Parasitology is the study of the organisms and the diseases (infections) they cause.

The Foundation Module 2 aims to provide you with the background knowledge and basic skills required to diagnose and manage infectious diseases as a medical practitioner. Management of infectious diseases includes treatment of the specific infections and taking measures to prevent the spread of these diseases. You will learn about the nature of microorganisms, the kinds of diseases they cause, how these diseases are acquired (pathogenesis), the laboratory diagnosis of these infections and the prevention and control of infectious diseases.

You are encouraged to participate actively in the learning exercises and discuss with the teaching staff. Preparation prior to participation in lessons and self- studying will be helpful to complete the Module successfully.

Dr. Sanath Senanayake

Chairperson/FM2

CONTENTS

1. INTRODUCTION

The Foundation Module 2 will consist of five weeks during the 5th term (week 6-10) of the undergraduate MBBS course. This module aims to lay the foundation for the teaching and learning sessions of the Infectious and Parasitic Diseases Module which is scheduled for the 6th - 7th term.

The objectives and format for the Microbiology and Parasitology components are given separately. The format and the objectives specified below are subject to regular review and amendments may be introduced as appropriate.

2. COMMITTEE

CHAIRPERSON : Dr. Sanath Senanayake
Department of Parasitology

CONVENOR : Dr. H W Dilanthi
Department of Biochemistry

MEMBERS:

Department of Microbiology

Prof. Jennifer Perera

Dr. Channa Senanayake

Dr. Enoka Corea

Dr. Nilanthi Senanayake

Dr. Sumudu Suranadee

Dr. Ishara Premathilake

Dr. Chathuri Gunasekera

Dr. Neesha Rockwood

Department of Parasitology

Prof. Nadira Karunaweera

Prof. Deepika Fernando

Prof. Sharmini Gunawardena

Dr. Yamuna Siriwardana

Dr. Nilakshi Samaranayake

Dr. Hermali Silva

3. AIMS OF THE MODULE

The Foundation Module 2 is aimed at producing a student who has a good grasp of the *basic scientific principles of Microbiology and Parasitology* and is capable of undertaking the study of the *practice of management of Infectious Diseases* in the subsequent "Infectious and Parasitic Diseases Module".

GENERAL OBJECTIVES

At the end of the module you should be able to:

1. Classify the infectious and parasitic disease agents.
2. Describe the aetiology, pathology and pathogenesis of the common infectious and parasitic diseases.
3. Discuss the laboratory diagnosis, management, epidemiology, prevention and control of the common infectious and parasitic diseases.

SPECIFIC OBJECTIVES

Describe the aetiology, pathology and pathogenesis of infectious and parasitic diseases

1. Name, classify and describe infectious and parasitic disease agents.
2. Describe the different host parasite relationships.
3. Name and describe the common pathogenic agents.
4. Define what is meant by source, mode of transmission, portal of entry and virulence of pathogens.
5. Describe the source, mode of transmission, portal of entry and virulence of pathogens causing common infections.
6. Identify the pathology underlying the common infectious and parasitic diseases.

Outline the principles underlying the laboratory diagnosis, management, epidemiology, prevention and control of infectious and parasitic diseases.

7. Outline the collection and transport of specimens for the laboratory diagnosis of common infectious and parasitic diseases.

8. List the laboratory tests available, outlining the underlying principles and critically evaluating the methods available for the diagnosis of common infectious and parasitic diseases.

9. Outline the principles of management of common infections and parasitic diseases including choice of chemotherapeutic agents.

10. Identify the important epidemiological aspects of common infectious and parasitic diseases.

11. Describe the principles in the prevention and control of common infectious and parasitic diseases including sterilization, disinfection, immunization, provision of safe food and water, improved sanitation and vector control measures.

4. FORMAT OF TEACHING

Lectures

Preliminary knowledge

1. Introduction to Microbiology / Introduction to Bacteria, Viruses, Fungi
2. Introduction to Parasitic diseases
3. Host parasite relationship and normal flora of the body
4. Pathogenesis and pathology of infectious diseases
5. Principles of laboratory diagnosis, transmission and control of parasitic diseases
6. Introduction to infectious diseases
7. Syndromes and organisms
8. Collection and transport of specimens
9. Laboratory diagnosis of infections
10. Principles of epidemiology and prevention and control of infectious diseases

Infections causing acute inflammation

1. Organisms causing upper respiratory tract infections (2 hours)
    i. Normal flora of the URT
    ii. Classification of Streptococci
    iii. *S. pyogenes*
    iv. Respiratory viruses (RSV, Parainfluenza, Adeno, Corona, Entero)

2. Organisms causing lower respiratory tract infections (2 hours)
    i. *S. pneumoniae*
    ii. *H. influenzae*
    iii. *M. pneumoniae*
    iv. *C. pneumoniae*
    v. *L. pneumophila*
    vi. *Bordetella pertussis*

3. Organisms causing CNS infections (2 hours)
    i. *N.meningitidis* (*S. pneumoniae / H. influenzae*)
    ii. Group B *Streptococci*
    iii. Listeria
    iv. Enteroviruses
    v. Mumps
    vi. Rabies
    vii. Polio
    viii. Introduction to arboviruses / Japanese encephalitis

4. Organisms causing urinary tract infections (2 hours)
    i. Introduction to enterobacteria
    ii. *E. coli* and other coliforms
    iii. *Enterococci / S. saprophyticus*
    iv. *Pseudomonas*
5. Small intestinal nematodes (2 hours)

6. Large intestinal nematodes &cestodes

7. Intestinal and urogenital protozoa

8. Organisms causing vaginitis
    i. Normal flora of the vagina
    ii. *Candida*
    iii. *Gardnerella*
    iv. *Trichomonas*

9. Organisms causing sexually transmitted diseases (3 hours)
    i. *N. gonorrhoea*
    ii. *C. trachomatis*
    iii. *T. pallidum*
    iv. *Herpes simplex virus*
    v. HIV
    vi. HPV

10. Organisms causing diarrhoea (2 hours)
    i. Pathogenesis of diarrhoea
    ii. Introduction to *Salmonella*
    iii. *Salmonella* causing food poisoning
    iv. *Shigella*
    v. *Campylobacter*
    vi. *Vibrio cholera*
    vii. *Clostridium welchii*
    viii. EIEC / EHEC/EPEC/ETEC
    ix. Rotavirus/Noro virus/Adenovirus/Calci virus

11. Organisms causing abdominal infections, Hepatitis (3 hours)
    i. Normal flora of the GIT (*Bacteroides, Enterobacteriacae, Enterococci*)
    ii. Introduction to anaerobes
    iii. Clostridium tetani/ C. botulinum/ C. perfringens / C. difficile
    iv. Hepatitis viruses

12. Organisms causing fever and rash (2 hours)
    i. Measles
    ii. Rubella
    iii. Chicken pox
    iv. Herpes simplex virus

13. Organisms causing chronic inflammation (2 hours)
    i. TB
    ii. Leprosy

14. Organisms causing fever (3 hours)
    i. *S. typhi/ S.paratyphi*
    ii. Dengue / Chikungunya/Zika
    iii. Influenza virus
    iv. Leptospira
    v. Rickettsae (typhus and spotted fever)
    vi. Melioidosis

15. Malaria (4 hours)

16. Organisms causing skin infections (2 hours)
    i. Normal flora of the skin
    ii. *S. aureus / S. epidermidis*
    iii. Introduction to fungi
    iv. Dermatophytes / Candida / *Malassezia furfur*

17. Leishmaniasis

18. Toxoplasmosis

19. Filariasis (3 hours)

Toxin-mediated damage

20. Organisms causing toxin-mediated infections
    i. Tetanus
    ii. Diphtheria
    iii. Food poisoning (*S.aureus, B. cereus, C.botulinum*)
    iv. Cholera / ETEC
    v. Toxic shock syndrome

Latent infections

21. Organisms causing latent infections (2 hours)
    i. Introduction to herpes viruses
    ii. CMV, EBV, HSV, VZV
    iii. HIV

Miscellaneous infections

22. Medically important arthropods

23. Pediculosis and scabies

24. Emerging and re-emerging infections

Preliminary to clinical microbiology

25. Sterilization and Disinfection

26. Principles of management of infections / Antibiotics and ABST

27. Immunization and vaccines

Microbiology Practical

1) Gram stain
2) Microscopy and colony morphology
3) Respiratory tract infections
4) CNS infections
5) STD and vaginitis
6) Diarrhoea and hepatitis
7) Skin infections / UTI
8) Fever with rash / Fever

Parasitology Practical

1) Introduction to use of microscopes
2) Malaria 1
3) Malaria 2
4) Demonstration of intestinal nematodes and cestodes
5) Intestinal Protozoa
6) Filariasis and Leishmaniasis
7) Medically important arthropods and snakes

CD Snakes

5. ASSESSMENT

The Foundation Module 2 will be assessed along with the Foundation Module 1 in the Unit 1 examination.

The theory component assessment will comprise of 50 Single best answer questions. The practical assessment will consist of 20 projected OSPEs (Microbiology) and Microscopic identification of Parasites (Parasitology).

The marks will be allocated as follows:
80% of the marks from the Single Best answer question paper and 20% of marks from the practical assessment (10% from the Microbiology practical examination and 10% from the Parasitology practical examination)

6. RECOMMENDED READING MATERIAL

6.1 Microbiology

1. Medical Microbiology and Infection at a glance. Stephen Gillespie and Kathleen Bamford.

2. Lippincott's illustrated reviews – Microbiology. Richard Harvey, Pamela Champe and Bruce Fisher

6.2 Parasitology

1. Basic Clinical Parasitology by Franklin A Neva and Harold W Brown. 6th Edition. Prentice Hall International Inc.

2. Essential Malariology by Bruce-Chwatt 2nd edition

3. Medical Parasitology by D.R.Arora and B.B.Arora, 3rd Edition

4. A Colour Atlas of Tropical Medicine and Parasitology by Peters and Gilles.

5. Atlas of Medical Helminthology and Protozoology. P.L.Chiodini. 4th Edition, Edinburgh: Churchill Livingstone, 2011.

Additional Reading Material

1. Worms and Human Diseases. Ralph Muller, 2nd Edition. Oxon: CABI Publishing, 2002.

2. Atlas of Medical Parasitology: an atlas of important protozoa, helmiths and arthropods. ZamanVigar. Hong Kong: Cameron Printing.

3. Principles and practice of clinical Parasitology. Stephen. H. Gillespie (Ed). Chichester. John Wiley, 2001.