LECTURE NOTES

For Nursing Students

Communicable Disease Control

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Produced in collaboration with the Ethiopia Public Health Training Initiative, The Carter

Preface

This lecture note was written because there is currently no uniformity in the syllabus and, for this course additionally, available textbooks and reference materials for health students are scarce at this level and the depth of coverage in the area of communicable diseases and control in the higher learning health institutions in Et

In order to accomplish the above objectives, efforts have been made to address all the topics mentioned in the In ordis(veod2aTv

Acknowledgments

I am highly indebted to acknowledge The Carter Center - Ethiopia Public Health Training Initiative (EPHTI), Addis

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Abbreviations and Acronyms

AFB	Acid Fast Bacilli
AIDS	Acquired Immuno-Deficiency Syndrome
BCG	Bacillus of Calmate-Guirein
Bid	*Bies in dies* (two times a day)
B. Sc.	Bachelor of Science degree
C^0	Degree Celsius
CNS	Central Nervous System
CSF	Cerebro-spinal fluid
CT	Computerized Tomography
DEC	Diethylcarbamazin Citrate
DOTS	Directly Observed Treatment Short course
GIT	Gastro-intestinal Tract
HIV	Human Immuno-deficiency Virus
IgM	Immunogloblin M.
IM	Intramuscular
IU	International Unit
IV	Intravenous
Kg	Kilogram
MOH	Ministry of Health
MRI	Magnetic Resonance Imaging
OPV	Oral Polio Vaccine
PO	*Per os* (per mouth)
PTB^+	Smear Positive Pulmonary Tuberculosis
QID	*Quadris in dies* (four times a day)

CHAPTER ONE

INTRODUCTION

1.1 Learning Objectives

At the end of this chapter, the student will be able to:

- Describe the burden of communicable diseases in Ethiopia.
- Define epidemiology and epidemiological terminologies.
- Identify the major communicable diseases that pose health problems in Ethiopia.

Diseases can be classified according to two major dimensions, namely the time course and cause. According to the time course, they are further classified as acute (characterized by a rapid onset and a short duration), and chronic disease (characterized by prolonged duration).

Based on the cause, diseases can be broadly categorized as infectious, (i.e. caused by living parasitic organisms such as viruses, bacteria, parasitic worms, insects, etc.), or as non-infectious (which are caused by something other than a living parasitic organism).

However, most of the common diseases in Africa are environmental diseases (infectious) due to infection by living

organisms. These are called communicable diseases, because they spread from person to person, or sometimes from animals to people. They occur at all ages but are most serious in childhood and they are to a great extent preventable. In developed countries where they have been prevented, other health conditions such as accidents and degenerative diseases become the most common. Therefore, communicable diseases remain very important in developing countries because:

- Many of them are very common
- Some of them are serious and cause death and disability
- Some of them cause widespread out breaks of disease or epidemics

- Anti-microbial chemotherapy
- Improved nutrition
- Better sanitation and housing

In less developed countries, however, especially in the tropics, infectious diseases continue to be one of the

- Pneumonia (8.9%)
- Tuberculosis of respiratory system (7.8%)
- Bacillary dysentery (1.6%)
- Gastroenteritis and colitis (1.5%)
- Meningitis (0.9%)

Á The top leading causes of deaths were:

- Tuberculosis of the respiratory system (10.1%)
- Pneumonia (7.3%)
- All types of malaria (4.6%)
- Bacillary dysentery (2.2%)
- Meningitis (1.5%)
- Gastroenteritis and colitis (1.1%)
- AIDS (0.8%)
- Leishmaniasis (0.5%)

Others, like yellow fever, acute febrile illnesses, trachoma (commonest cause of blindness in Ethiopia), and trypanosomiasis, are the major public health problems in our country.

1.3 Epidemiological Terms and Definitions

Epidemiology- the study of the frequency, distribution and determinants of disease and other health related conditions in human populations, and the application of this study to the

promotion of health and to the prevention and control of health

smoking leads to lung cancer. Having multiple sexual partners results in STI).

Definition of other epidemiological terms:

1. **Epidemics** - the occurrence of any health related condition in a given population in excess of the usual frequency in that population.
2. **Endemic** - a disease that is usually present in a population or in an area at a more or less stable level.
3. **Sporadic** - a disease that does not occur in that population, except at occasional and irregular intervals.
4. **Pandemic** - an epidemic disease which occurs world-wide
5. **Disease** - a state of physiological or psychological dysfunction.
6. **Infection** - the entry and development or multiplication of an infectious agent in the body of man or animal
7. **Contamination**

Review Questions

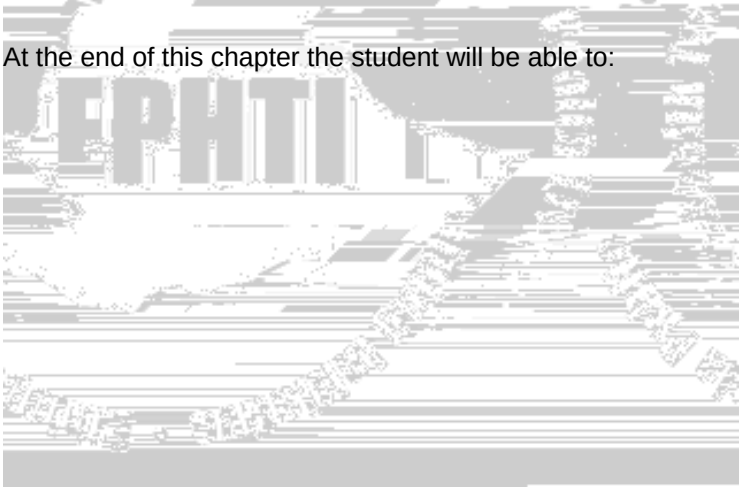
1. How do you compare the impact of communicable disease in Ethiopia with that of the developed world?
2. What are some of communicable diseases that create major health problems in Ethiopia?
3. Define the following terms:
   - Epidemiology
   - Epidemics
   - Endemic
   - Pandemic
   - Sporadic
   - Infection and infectious agent
4. Why are communicable diseases very important in Ethiopia?

CHAPTER TWO

DEFINITION, DESCRIPTION OF THE TRANSMISSION, PREVENTION AND CONTROL OF COMMUNICABLE DISEASES

2.1 Learning Objectives

At the end of this chapter the student will be able to:



indirectly, through an intermediate plant or animal host, vector or inanimate environment.

2.3 Chain of Disease Transmission

This refers to a logical sequence of factors or links of a chain that are essential to the development of the infectious agent and propagation of disease. The six factors involved in the chain of disease transmission are:

a. Infectious agent (etiology or causative agent)
b. Reservoir
c. Portal of exit
d. Mode of transmission
e. Portal of entry
f. Susceptible host

a. Infectious agent: An organism that is capable of producing infection or infectious disease.

On the basis of their size, etiological agents are generally classified into:

- Metazoa (multicellular organisms). (e.g. Helminths).
- Protozoa (Unicellular organisms) (e.g. Ameobae)
- Bacteria (e.g. Treponema pallidum, Mycobacterium tuberculosis, etc.)
- Fungus (e.g. Candida albicans)
- Virus (e.g. Chickenpox, polio, etc.)

b. Reservoir of infection: Any person, animal, arthropod, plant, soil or substance (or combination of these) in which an infectious agent normally lives and multiplies, on which it depends primarily for survival and where it reproduces itself in such a manner that it can be transmitted to a susceptible host.

Types of reservoirs

1. Man: There are a number of important pathogens that are specifically adapted to man, such as: measles, smallpox, typhoid, meningococcal meningitis, gonorrhea and syphilis. The cycle of transmission is from human to human.

2. Animals: Some infective agents that affect man have their reservoir in animals. The term "zoonosis" is applied to disease transmission from animals to man under natural conditions. For example:

- Bovine tuberculosis - cow to man
- Brucellosis - Cows, pigs and goats to man
- Anthrax - Cattle, sheep, goats, horses to man
- Rabies - Dogs, foxes and other wild animals to man

Man is not an essential part (usual reservoir) of the life cycle of the agent.

Animal …….. Animal……Animal

↓

Human

3. Non-living things as reservoir: Many of the agents are basically saprophytes living in soil and fully adapted to live freely in nature. Biologically, they are usually equipped to withstand marked environmental changes in temperature and humidity.

E.g. Clostridium botulinum etiologic agent of Botulism
Clostridium tetani etiologic agent of Tetanus
Clostridium welchi etiologic agent of gas gangrene

c. Portal of exit (mode of escape from the reservoir): This is the site through which the agent escapes from the reservoir. Examples include:

- GIT: typhoid fever, bacillary dysentery, amoebic dysentery, cholera, ascariasis, etc.
- Respiratory: tuberculosis, common cold, etc.
- Skin and mucus membranes: Syphilis

d. Mode of transmission (mechanism of transmission of infection): Refers to the mechanisms by which an infectious agent is transferred from one person to another or from a reservoir to a new host. Transmission may be direct or indirect.

1. Direct transmission: Consists of essentially immediate transfer of infectious agents from an infected host or reservoir to an appropriate portal of entry. This could be:

a. Direct Vertical

Such as: transplacental transmission of syphilis, HIV, etc.

b. Direct horizontal

Direct touching, biting, kissing, sexual intercourse, droplet spread onto the conjunctiva or onto mucus membrane of eye, nose or mouth during sneezing coughing, spitting or talking; Usually limited to a distance of about one meter or less.

2. Indirect transmission

a. Vehicle-borne transmission: Indirect contact through contaminated inanimate objects (fomites) like:

- Bedding, toys, handkerchiefs, soiled clothes, cooking or eating utensils, surgical instruments.
- Contaminated food and water
- Biological products like blood, serum, plasma or IV-fluids or any substance serving as intermediate means by which an infectious agent is transported and introduced into a susceptible host through a suitable portal of entry. The agent may or may not multiply or develop in the vehicle before it is introduced into man.

b. Vector-borne transmission: Occurs when the infectious agent is conveyed by an arthropod (insect) to a susceptible host.

1. Mechanical transmission: The arthropod transports the agent by soiling its feet or proboscis, in which case multiplication of the agent in the vector does not occur. (e.g. common house fly.)

2. Biological transmission: This is when the agent multiplies in the arthropod before it is transmitted, such as the transmission of malaria by mosquito.

C. Air-borne transmission: Dissemination of microbial agent by air to a suitable portal of entry, usually the respiratory tract. Two types of particles are implicated in this kind of spread: dusts and droplet nuclei.

Dust: small infectious particles of widely varying size that may arise from soil, clothes, bedding or contaminated floors and be resuspended by air currents.

Droplet nuclei : Small residues resulting from evaporation of fluid (droplets emitted by an infected host). They usually remain suspended in the air for long periods of time.

e. Portal of entry: The site in which the infectious agent enters to the susceptible host. For example:

- Mucus membrane
- Skin
- Respiratory tract

2.4 Carrier and Its Type

A carrier is an infected person or animal who does not have apparent clinical disease but is a potential source of infection to others.

a. **Healthy or asymptomatic carriers:** These are persons whose infection remains unapparent. For example, in poliovirus, meningococcus and hepatitis virus infections, there is a high carrier rate.

b. **Incubatory or precocious carriers:** These are individuals or persons who excrete the pathogen during the incubation period (i.e. before the onset of symptoms or before the characteristic features of the disease are manifested).

   E.g. Measles, mumps, chickenpox and hepatitis.

c. **Convalescent Carriers:** These are those who continue to harbor the infective agent after recovering from the illness. **E.g.** Diphtheria, Hepatitis B virus.

d. **Chronic Carriers:** The carrier state persists for a long period of time. **E.g.** Typhoid fever, Hepatitis B virus infection

2.5 Time Course of Infectious Diseases

Incubation period: It is the interval of time between infection of the host and the first appearance of symptoms and signs of the disease.

Prodormal period: It is the interval between the onset of symptoms of an infectious disease and the appearance of characteristic manifestations. For example, in **a** measles patient, fever and coryza occur in the first three days and Koplick spots in the buccal mucosa and characteristics skin lesions appear on the fourth day.

Period of communicability: The period during which that particular communicable disease (infectious agent) is transmitted from the infected person to the susceptible host.

2.6 Levels of Prevention

The different points in the progression of a disease at which one can intervene can be classified according to three levels of prevention: primary, secondary, and tertiary.

a. Primary prevention: The objectives here are to promote health, prevent exposure, and prevent disease.

Health promotion: This consists of general non-specific interventions that enhance health and the body's ability to resist disease, such as measures aimed at the improvement of socio-economic status through the provision of adequately-

short it is any intervention that promotes a healthier and happier life.

Prevention of exposure:- This includes actions such as the provision of safe and adequate water, proper excreta disposal, vector control, safe environment at home (e.g., proper storage of insecticides and medicines, out of children's reach), at school and at work (e.g., proper ventilation, monitoring of harmful substances in factories), and on the streets (e.g., driver licensing laws).

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c. Tertiary prevention: After permanent damage has set in, the objective of tertiary prevention is to limit the impact of that damage. The impact can be physical, psychological, social (social stigma or avoidance by others), and financial. Rehabilitation refers to the retraining of remaining functions for maximum effectiveness, and should be seen in a very broad sense, not simply limited to the physical aspect. Thus the provision of special disability pensions would be a form of tertiary prevention.

2.7 Communicable Disease Control

This refers to the reduction of the incidence and prevalence of communicable disease to a level where it cannot be a major public health problem.

Methods of Communicable Disease Control

There are three main methods of controlling communicable diseases:

1. Elimination of the Reservoir

a. Man as reservoir: When man is the reservoir, eradication of an infected host is not a viable option. Instead, the following options are considered:

- **Detection and adequate treatment of cases:** arrests the communicability of the disease (e.g. Treatment of active pulmonary tuberculosis).
- **Isolation:** separation of infected persons for a period of communicability of the disease. Isolation is indicated for infectious disease with the following features:
  - High morbidity and mortality
  - High infectivity
- **Quarantine:** limitation of the movement of apparently well person or animal who has been exposed to the infectious disease for a duration of the maximum incubation period of the disease.

b. Animals as reservoir: Action will be determined by the usefulness of the animals, how intimately they are associated to man and the feasibility of protecting susceptible animals. For example:

- Plague: The rat is regarded as a pest and the objective would be to destroy the rat and exclude it from human habitation.
- Rabies: Pet dogs can be protected by vaccination but stray dogs are destroyed.
- Infected animals used for food are examined and destroyed.

c. Reservoir in non-living things: Possible to limit man's exposure to the affected area (e.g. Soil, water, forest, etc.).

2. Interruption of transmission

This involves the control of the modes of transmission from the reservoir to the potential new host through:

- Improvement of environmental sanitation and personal hygiene
- Control of vectors
- Disinfections and sterilization

3. Protection of susceptible host: This can be achieved through:

- Immunization: Active or Passive
- Chemo-prophylaxis- (e.g**.** Malaria, meningococcal meningitis, etc.)
- Better nutrition
- Personal protection. (e.g. wearing of shoes, use of mosquito bed net, insect repellents, etc.)

Review Questions

1. State the six important factors that involve the chain of communicable diseases transmission.
2. Describe the three levels of disease prevention.
3. What are the methods used to control communicable diseases?

CHAPTER THREE

ORAL-FECAL TRANSMITTED DISEASES

3.1 Learning Objectives

Therefore, the causative organisms have to pass through the environment from the feces of an infected person to the gastro-intestinal tract of a susceptible person. This is known as the fece-oral transmission route. Oral-oral transmission occurs mostly through unapparent fecal contamination of food, water and hands.

As indicated in the schematic diagram below, food takes a central position; it can be directly or indirectly contaminated via polluted water, dirty hands, contaminated soil, or flies.

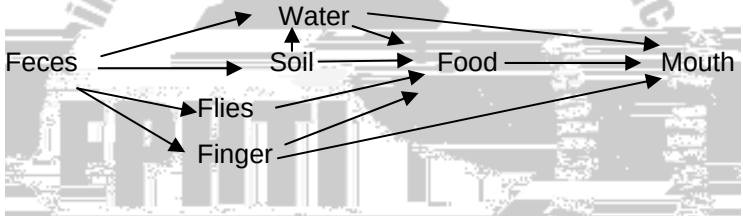

Fig. 3.1 The five "Fs" which play an important role in fecal oral diseases transmission (finger, flies, food, fomites and fluid). (From Eshuis, Manschot,1978, Communicable Diseases: A Manual for Rural Health Workers, African Medical and Research Association, Nairobi, Kenya)

3.3 Feces Mainly in Water

The diseases in this group are mainly transmitted through fecally contaminated water rather than food.

3.3.1 Typhoid fever

Definition

A systemic infectious disease characterized by high continuous fever, malaise and involvement of lymphoid tissues.

Infectious agent

Salmonella typhi

Salmonella enteritidis (rare cause)

Epidemiology

Occurrence- It occurs worldwide, particularly in poor socio-economic areas. Annual incidence is estimated at about 17 million cases with approximately 600,000 deaths worldwide. In endemic areas the disease is most common in preschool and school aged children (5-19 years of age).

Reservoir- Humans

Mode of transmission- By water and food contaminated by feces and urine of patients and carriers. Flies may infect foods in which the organisms then multiply to achieve an infective dose.

Incubation period –1-3 weeks

Period of communicability- As long as the bacilli appear in excreta, usually from the first week throughout convalescence. About 10% of untreated patients will discharge bacilli for 3 months after onset of symptoms, and 2%-5% become chronic carriers.

Susceptibility and resistance- Susceptibility is general and increased in individuals with gastric achlorhydria or those who are HIV positive. Relative specific immunity follows recovery from clinical disease, unapparent infection and active immunization but inadequate to protect against subsequent ingestion of large numbers of organisms.

Clinical manifestation

First week- Mild illness characterized by fever rising stepwise (ladder type), anorexia, lethargy, malaise and general aches. Dull and continuous frontal headache is prominent. Nose bleeding, vague abdominal pain and constipation in 10% of patients.

Second week- Sustained temperature (fever). Severe illness with weakness, mental dullness or delirium, abdominal discomfort and distension. Diarrhea is more common than first week and feces may contain blood.

Third week- Patient continues to be febrile and increasingly exhausted. If no complications occur, patient begins to improve and temperature

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6. Exclusion of typhoid carriers and patients from handling of food and patients
7. Immunization for people at special risk (e.g. Travelers to endemic areas)

8. Regular check-up of food handlers in food and drinking establishments

3.3.2 Bacillary Dysentery (Shigellosis)

Definition

An acute bacterial disease involving the large and distal small intestine, caused by the bacteria of the genus shigella.

Infectious agent

Shigella is comprised of four species or serotypes.

Group A= Shigella dysentraie (most common cause)

Group B= Shigella flexneri

Group C= Shigella boydii

Group D= Shigella sonnei

Epidemiology

Occurrence- It occurs worldwide, and is endemic in both tropical and temperate climates. Outbreaks commonly occur

centers, mental hospitals and refugee camps. It is estimated that the disease causes 600,000 deaths per year in the world. Two-thirds of the cases, and most of the deaths, are in children under 10 years of age.

Reservoir- Humans

Mode of transmission- Mainly by direct or indirect fecal-oral transmission from a patient or carrier. Transmission through water and milk may occur as a result of direct fecal contamination. Flies can transfer organisms from latrines to a non-refrigerated food item in which organisms can survive and multiply.

Incubation period- 12 hours-4 days (usually 1-3 days)

Period of communicability- During acute infection and until the infectious agent is no longer present in feces, usually within four weeks after illness.

Clinical Manifestation

- Fever, rapid pulse, vomiting and abdominal cramp are prominent.
- Diarrhea usually appears after 48 hours with dysentery supervening two days later.
- Generalized abdominal tenderness.
-

3. Proper excreta disposal especially from patients, convalescent and carriers.
4. Adequate and safe water supply.
5. Control of flies.
6. Cleanliness in food handling and preparation.

3.3.3 Amoebiasis (Amoebic Dysentery)

Definition

An infection due to a protozoan parasite that causes intestinal or extra-intestinal disease.

Infectious agent

Clinical Manifestation

- Starts with a prodormal episode of diarrhea, abdominal cramps, nausea, vomiting and tenesmus.
- With dysentery, feces are generally watery, containing mucus and blood.

Diagnosis

- Demonstration of etamoeba histolytica cyst or trophozoite in stool.

Treatment

1. Metronidazole or Tinidazole

Prevention and control

1. Adequate treatment of cases
2. Provision of safe drinking water
3. Proper disposal of human excreta (feces) and handwashing following defecation.
4. Cleaning and cooking of local foods (e.g. raw vegetables) to avoid eating food contaminated with feces.

3.3.4 Giardiasis

Definition

A protozoan infection principally of the upper small intestine associated with symptoms of chronic diarrhea, steatorrhea,

abdominal cramps, bloating, frequent loose and pale greasy stools, fatigue and weight loss.

Infectious agent

Giardia lamblia

Epidemiology

Occurrence- Worldwide distribution. Children are more affected than adults. The disease is highly prevalent in areas of poor sanitation.

Reservoir- Humans

Mode of transmission- Person to person transmission occurs by hand to mouth transfer of cysts from feces of an infected individual especially in institutions and day care centers.

Period of communicability- Entire period of infection, often months.

Susceptibility and resistance- Asymptomatic carrier rate is high. Infection is frequently self-limited. Persons with AIDS may have more serious and prolonged infection.

Life cycle

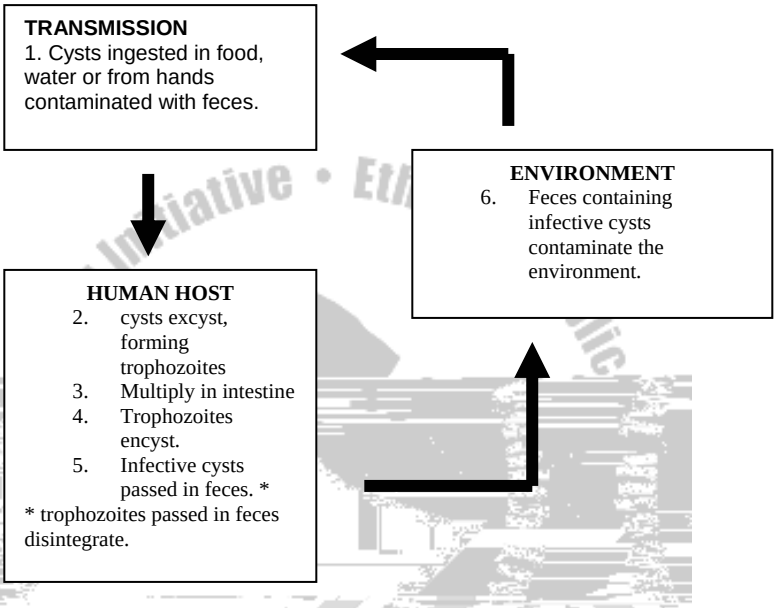


Fig. 3.3 Transmission and Life Cycle of Giardia Lamblia. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

- Ranges from asymptomatic infection to severe failure to thrive and mal-absorption.
- Young children usually have diarrhea but abdominal distension and bloating are frequent.

- Adults have abdominal cramps, diarrhea, anorexia, nausea, malaise, bloating, many patients complain of sulphur testing (belching).

Diagnosis

- Demonstration of Giardia lamblia cyst or trophozoite in feces.

Treatment

1. Metronidazole or Tinidazole

Prevention and control

1. Good personal hygiene, and handwashing before food and following toilet use

Infectious agent

Vibrio cholerae

Epidemiology

Occurrence- has made periodic outbreaks in different parts of the world and given rise to pandemics. Endemic predominantly in children.

Reservoir- Humans

Mode of transmission- by ingestion of food or water directly or indirectly contaminated with feces or vomitus of infected person.

Incubation period- from a few hours to 5 days, usually 2-3 days.

Period of communicability- for the duration of the stool positive stage, usually only a few days after recovery. Antibiotics shorten the period of communicability.

Susceptibility and resistance- Variable. Gastric achlorhydria increases risk of illness. Breast-fed infants are protected.

Clinical Manifestation

- Abrupt painless watery diarrhea; the diarrhea looks like rice water.
- In severe cases, several liters of liquid may be lost in few hours leading to shock.
- Severely ill patients are cyanotic, have sunken eyes and cheeks, scaphoid abdomen, poor skin turgor, and thready or absent pulse.
- Loss of fluid continues for 1-7 days.

Diagnosis

- Based on clinical grounds
- Culture (stool) confirmation

Treatment

1. Prompt replacement of fluids and electrolytes
   - Rapid IV infusions of large amounts
   - Isotonic saline solutions alternating with isotonic sodium bicarbonate or sodium lactate.
2. Antibiotics like tetracycline dramatically reduce the duration and volume of diarrhea resulting in early eradication of vibrio cholerae.

Nursing care

1. Wear gown and glove.
2. Wash your hands.

3. Monitor output including stool output.
4. Protect the patient family by administering Tetracycline.
5. Health education.

Prevention and control

1. Case treatment
2. Safe disposal of human excreta and control of flies
3. Safe public water supply
4. Handwashing and sanitary handling of food
5. Control and management of contact cases

3.3.6 Infectious hepatitis

(Viral hepatitis A, Epidemic hepatitis, type A hepatitis)

Definition

An acute viral disease characterized by abrupt onset of fever, malaise, anorexia, nausea and abdominal discomfort followed within a few days by jaundice.

Infectious agent

Hepatitis A virus

Epidemiology

Occurrence- Worldwide distribution in sporadic and epidemic forms. In developing countries, adults are usually immune and

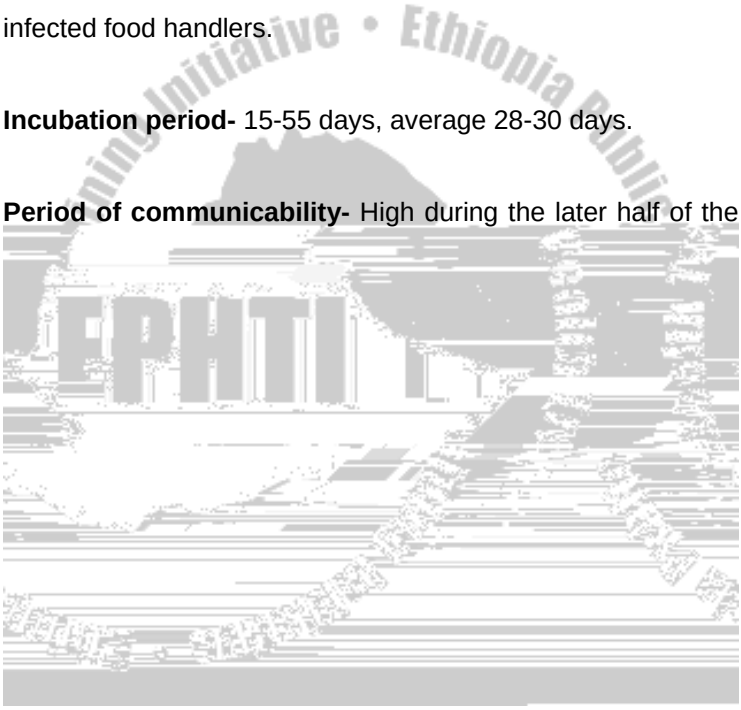
epidemics of HA are uncommon. Infection is common where environmental sanitation is poor and occurs at an early age.

Reservoir- Humans.

Mode of transmission- Person to person by fecal-oral route. Through contaminated water and food contaminated by infected food handlers.

Incubation period- 15-55 days, average 28-30 days.

Period of communicability- High during the later half of the



3.4.1 Ascariasis

Definition

A helminthic infection of the small intestine generally associated with few or no symptoms.

Infectious agent

Ascaris lumbricoides.

Epidemiology

Occurrence- The most common parasite of humans where sanitation is poor. School children (5-10 years of age) are most affected. Highly prevalent in moist tropical countries

Reservoir- Humans; ascarid eggs in soil.

Mode of transmission- Ingestion of infective eggs from soil contaminated with human feces or uncooked produce contaminated with soil containing infective eggs but not directly from person to person or from fresh feces.

Incubation period- 4-8 weeks.

Period of communicability- As long as mature fertilized female worms live in the intestine. Usual life span of the adult worm is 12 months.

Susceptibility and resistance- Susceptibility is general.

Life Cycle

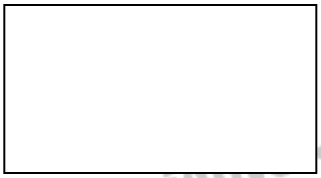


Fig. 3.4 Transmission and life cycle of Ascaris lumbricoides. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

- Most infections go unnoticed until large worm is passed in feces and occasionally the mouth and nose.
- Migrant larvae may cause itching, wheezing and dyspnea, fever, cough productive of bloody sputum may occur.

- Abdominal pain may arise from intestinal or duct (biliary, pancreatic) obstruction.
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Life Cycle

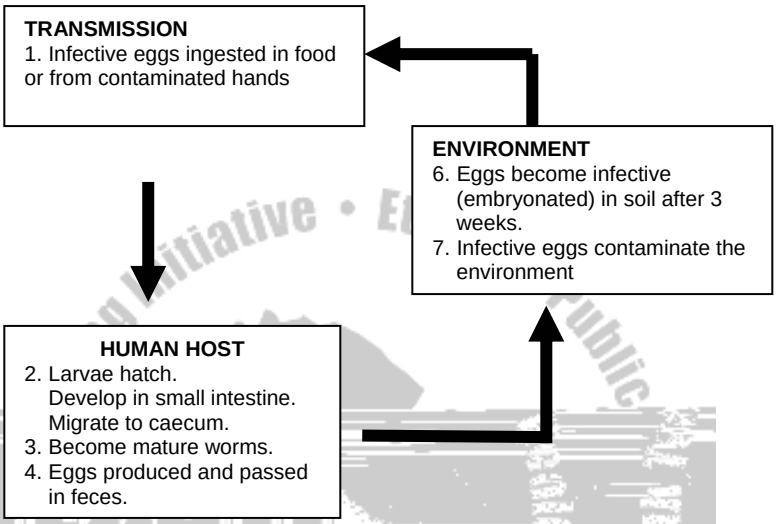

Fig. 3.5 Transmission and life cycle of Trichuris trichuria. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical manifestation

- Severity is directly related to the number of infecting worms.
- Most infected people are asymptomatic.
- Abdominal pain, tiredness, nausea and vomiting, diarrhea or constipation are complaints by patients.
- Rectal prolapse may occur in heavily infected very young children.

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Epidemiology

Occurrence- Worldwide, affecting all socio-economic classes with high rates in some areas. Prevalence is highest in

Life Cycle

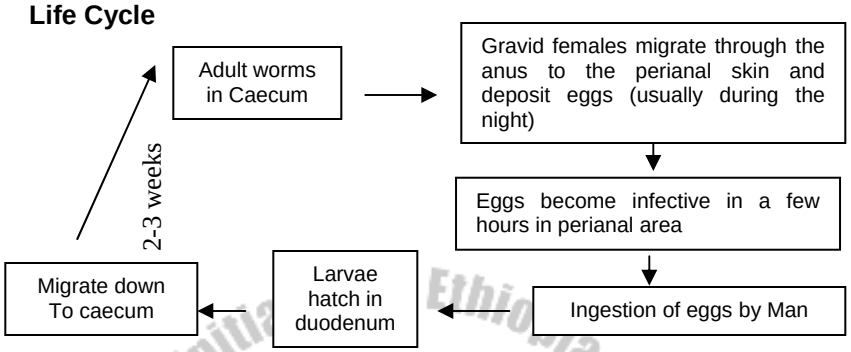

Fig. 3.6 Transmission and life cycle of Entrobius vermicularis. (From Hegazi M., 1994, Applied Human Parasitology, 1st edition, the Scientific Book Centers, Cairo.)

Clinical manifestation

Á Perianal itching, disturbed sleep, irritability and some times secondary infection of the scratched skin.

Diagnosis

Á Stool microscopy for eggs or female worms.

Treatment

1. Mebendazole.

Prevention and control

1. Educate the public about hygiene (i.e. handwashing before eating or preparing food, keeping nails short and discourage nail biting).
2. Treatment of cases
3. Reduce overcrowding in living accommodations.
4. Provide adequate toilets.

3.4.4. Strongyloidiasis

Definition

An often asymptomatic helminthic infection of the duodenum and upper jejunum.

Infectious agent

Strongyloides stercolaris

Epidemiology

Occurrence- In tropical and temperate areas. More common in warm and wet regions.

Treatment

1. Albendazole or
2. Thiabendazole

Prevention and control

Mode of transmission- Through skin penetration by the infective larvae.

Incubation period- Symptoms may develop after a few weeks to many months depending on intensity of infection and iron intake of the host.

Period of communicability- Infected people can contaminate the soil for several years in the absence of treatment.

Susceptibility and resistance- Susceptibility is universal. No evidence that immunity develops with infection.

Life cycle

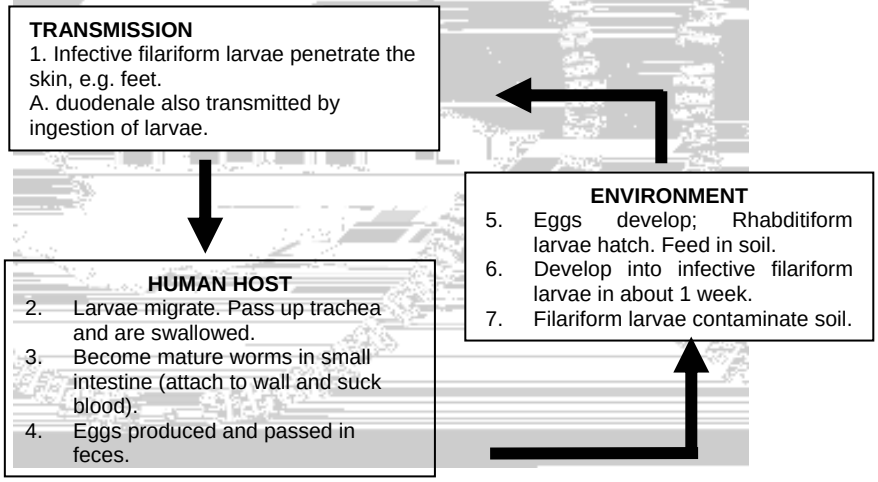

Fig. 3.8 Transmission and life cycle of Hookworms: Ancylostoma duodenale and Nectar americanus. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

The clinical manifestation is related to:

1. Larval migration of the skin

Á Produces transient, localized maculopapular rash associated with itching called ground itch.

2. Migration of larva to the lungs.

Á Produces cough, wheezing and transient pneumonitis.

3. Blood sucking

Á Light infection-no symptoms

Á Heavy infection-result in symptoms of peptic ulcer disease like epigastric pain and tenderness. Further loss of blood leads to anemia manifested by exertional dyspenea, weakness and light-headedness.

Diagnosis

Á Demonstration of eggs in stool specimen.

Treatment

1. Mebendazole or
2. Albendazole or
3. Levamisole

Prevention and control

1. Sanitary disposal of feces
2. Wearing of shoes
3. Case treatment.

3.5 Direct Contact with Feces

These are diseases transmitted mainly through direct contact with feces of the infected person.

3.5.1 Poliomyelitis

Definition

A viral infection most often recognized by the acute onset of flaccid paralysis.

Infectious agent

Polio viruses (type I, II and III)

Epidemiology

Occurrence – Worldwide prior to the advent of immunization. Cases of polio occur both sporadically and in epidemics. Primarily a disease of infants and young children. 70-80% of cases are less than three years of age. More than 90% of infections are unapparent. Flaccid paralysis occurs in less than 1% of infections.

Reservoir – humans, especially children

Mode of transmission- Primarily person-to-person, spread principally through the fecal-oral route. In rare instances, milk,

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Treatment

Symptomatic

Prevention and control

1. Educate public about the advantage of immunization in early childhood.
2. Trivalent live attenuated vaccine (OPV) at birth.
3. Safe disposal of human excreta (feces).

3.5.2 Hydatid Disease (Echinococcosis)

Definition

The tapeworm Echinococcus granulosus is the most common species of Echinococcus and causes cystic hydatid disease.

Infectious agent

Echinococcus granulosus, a small tapeworm of dog

Epidemiology

Occurrence – occurs on all continents except Antarctica. Especially common in grazing countries where dogs consume viscera containing cysts.

Reservoir- Domestic dogs and other canids are definitive hosts; they may harbor thousands of adult tapeworms in their

intestines without signs of infection. Sheep act as intermediate hosts.

Mode of transmission – directly with hand to mouth transfer of eggs after association with infected dogs or indirectly through contaminated food, water, soil or fomites.

Incubation period – variable from 12 months to many years, depending on the number and location of cysts and how rapidly they grow.

Period of communicability – Infected dogs begin to pass eggs approximately 7weeks after infection. Most canine infections resolve spontaneously by six months.

Susceptibility and resistance – Children are more likely to be exposed to infection because they are more likely to have close contact with infected dogs.

Clinical manifestations

- The signs and symptoms vary according to location of the cyst and number.
- Ruptured or leaking cysts can cause severe anaphylactic reactions.
- Cysts are typically spherical, thick walled and unilocular and are most frequently found in the liver and lungs.

Diagnosis

- History of residence in an endemic area along with association with canines
- Sonography and CT scan
- Serologic test

Treatment

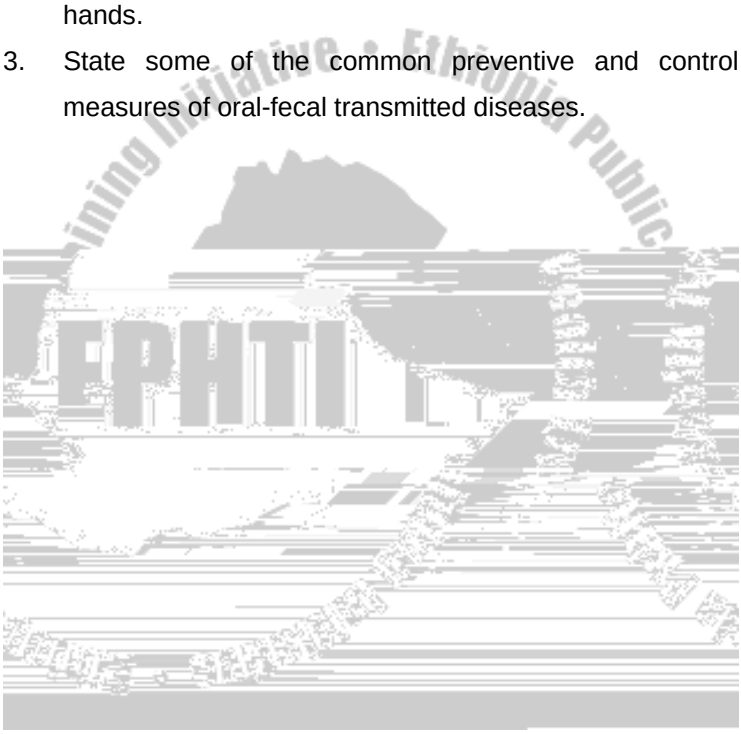
1. Surgical resection of isolated cysts is the most common treatment.
2. Albendazol (mebendazol)
3. If cysts rupture, praziquantel

Prevention and control

1. Educate the public at risk to avoid exposure to dog feces. Handwashing should be emphasized.
2. Interrupt transmission from intermediate to definitive hosts by preventing dogs' access to uncooked viscera.
3. Safe disposal of infected viscera.
4. Periodical treatment of high-risk dogs.

Review Questions

1. What does fecal-oral transmission mean?
2. Mention some of the diseases transmitted through unapparent fecal contamination of food, water and hands.
3. State some of the common preventive and control measures of oral-fecal transmitted diseases.



CHAPTER FOUR

AIR-BORNE DISEASES

4.1 Learning Objectives

At the end of this chapter, students will be able to:

- List common air-borne diseases.
- Identify the common modes of air-borne diseases transmission.
- Participate in diagnosis and treatment of common air-borne diseases.
- Apply preventive and control methods for air-borne diseases.

4.2 Introduction

The organisms causing the diseases in the air-borne group enter the body via the respiratory tract. When a patient or carrier of pathogens talks, coughs, laughs, or sneezes, he/she discharges fluid droplets. The smallest of these remain up in the air for some time and may be inhaled by a new host. Droplets with a size of 1-5 microns are quite easily drawn in to the lungs and retained there.

Droplets that are bigger in size will not remain air-borne for long but will fall to the ground. Here, however, they dry and mix with dust. When they contain pathogens that are able to survive drying, these may become air-borne again by wind or something stirring up the dust, and they can then be inhaled. Air-borne diseases, obviously, will spread more easily when there is overcrowding, as in overcrowded class rooms, public transport, canteens, dance halls, and cinemas. Good ventilation can do much to counteract the effects of overcrowding. Air-borne diseases are mostly acquired through the respiratory tract.

4.3 Common Cold (Acute Viral Rhinitis or Coryza)

Definition

An acute catarrhal infection of the upper respiratory tract.

Infectious agent

Rhino viruses (100 serotypes) are the major causes in adults. Parainfluenza viruses, respiratory syncytial viruses (RSV), Influenza, and Adeno viruses cause common cold-like illnesses in infants and children.

Epidemiology

Occurrence- Worldwide both in endemic and epidemic forms. Many people have one to six colds per year. Greater incidence in the highlands. Incidence is high in children under 5 years and gradually declines with increasing age.

Reservoir- Humans

Mode of transmission- by direct contact or inhalation of airborne droplets. Indirectly by hands and articles freshly soiled by discharges of nose and throat of an infected person.

Incubation period- between 12 hours and 5 days, usually 48 hours, varying with the agent.

Period of communicability- 24 hours before onset and for 5 days after onset.

Susceptibility and resistance- Susceptibility is universal. Repeated infections (attacks) are most likely due to multiplicity of agents.

Clinical Manifestation

- Coryza, sneezing, lacrimation, pharyngeal or nasal irritation, chills and malaise
- Dry or painful throat.

Diagnosis

- Based on clinical grounds

Treatment

1. No effective treatment but supportive measures like :
   - Bed rest
   - Steam inhalation
   - High fluid intake
   - Anti pain
   - Balanced diet intake

Prevention and Control

1. Educate the public about the importance of:
   - Handwashing
   - Covering the mouth when coughing and sneezing
   - Sanitary disposal of nasal and oral discharges
2. Avoid crowding in living and sleeping quarters especially in institutions
3. Provide adequate ventilation

4.4 Measles (Rubella)

Definition

An acute highly communicable viral disease

Infectious agent

Measles virus

Epidemiology

Occurrence- Prior to widespread immunization, measles was common in childhood so that more than 90% of people had been infected by age 20; few went through life without any attack.

Reservoir- Humans

Mode of transmission- Airborne by droplet spread, direct contact with nasal or throat secretions of infected persons and less commonly by articles freshly solid with nose and throat secretion. Greater than 94% herd immunity may be needed to interrupt community transmission.

Incubation period- 7-18 days from exposure to onset of fever.

Period of communicability- slightly before the prodromal period to four days after the appearance of the rash and minimal after the second day of rash.

Susceptibility and resistance- All those who are non-vaccinated or have not had the disease are susceptible. Permanent immunity is acquired after natural infection or immunization.

Clinical Manifestation

- Prodromal fever, conjunctivitis, coryza, cough and Koplik spots on the buccal mucosa
- A characteristic red blotchy rash appears on the third to seventh day, beginning on the face, gradually becoming generalized, lasting 4-7 days.
- Leucopoenia is common.
- Complications like otitis media, pneumonia, diarrhea, encephalitis, croup (Laryngo tracheo bronchitis) may result from viral replication or bacterial super infection.

Diagnosis

- Based on clinical and epidemiological grounds

Treatment

1. No specific treatment
2. Treatment of complications
3. Vitamin A provision

Nursing care

1. Advise patient to have bed rest.
2. Relief of fever.
3. Provision of non-irritant small frequent diet.
4. Shorten the fingernails.

Prevention and control

1. Educate the public about measles immunization.

2. Immunization of all children (less than 5 years of age) who had contact with infected children.
3. Provision of measles vaccine at nine months of age.
4. Initiate measles vaccination at 6 months of age during epidemic and repeat at 9 months of age.

4.5 Influenza

Definition

An acute viral disease of the respiratory tract

Infectious agent

Three types of influenza virus (A,B and C)

Epidemiology

Occurrence- In pandemics, epidemics and localized

Period of communicability- 3-5 days from clinical onset in adults; up to 7 days in young children.

Susceptibility and resistance- when a new sub-type appears, all children and adults are equally susceptible. Infection produces immunity to the specific infecting agent.

Clinical Manifestation

- Fever, head ache, mayalgia, prostration, sore throat and cough
- Cough is often severe and protracted, but other manifestations are self-limited with recovery in 2-7days

Diagnosis

- Based on clinical ground

Treatment

1. Same as common cold, namely:
   - Anti-pain and antipyretic
   - High fluid intake
   - Bed rest
   - Balanced diet intake

Prevention and control

1. Educate the public in basic personal hygiene, especially the danger of unprotected coughs and sneezes and hand to mucus membrane transmission.

2. Immunization with available killed virus vaccines may provide 70-80% protection.
3. Amantadize hydrochloride is effective in the chemprophylaxis of type A virus but not others.

4.6 Diphtheria

Definition

An acute bacterial disease involving primarily tonsils, pharynx, nose, occasionally other mucus membranes or skin and sometimes the conjunctiva or genitalia.

Infectious agent

Corynebacterium diphtheriae

Epidemiology

Occurrence- Disease of colder months in temperate zones, involving primarily non-immunized children under 15 years of age. It is often found among adult population groups whose immunization was neglected. Unapparent, cutaneous and wound diphtheria cases are much more common in the tropics.

Reservoir- Humans

Mode of transmission- contact with a patient of carrier. i.e. with oral or nasal secretions or infected skin.

Incubation period- usually 2-5 days

Period of communicability- variable, until virulent bacilli have disappeared from discharges and lesion; usually 2 weeks or less.

Susceptibility and resistance- Susceptibility is universal. Infants borne to immune mothers are relatively immune, but protection is passive and usually lost before 6 months. Recovery from clinical disease is not always followed by lasting immunity. Immunity is often acquired through unapparent infection. Prolonged active immunity can be induced by diphtheria toxoid.

Clinical Manifestation

- Characteristic lesion marked by a patch or patches of an adherent grayish membrane with a surrounding inflammation (pseudo membrane).
- Throat is moderately sore in pharyngo tonsillar diphtheria, with cervical lymph nodes somewhat enlarged and tender; in severe cases, there is marked swelling and edema of neck.
- Late effects of absorption of toxin appearing after 2-6 weeks, including cranial and peripheral, motor and sensory nerve palsies and myocarditis (which may occur early) and are often severe.

Diagnosis

- Based on clinical and epidemiological grounds
- Bacteriologic examination of discharges from lesions.

Treatment

1. Diphtheria antitoxin
2. Erythromycin for 2 weeks but 1 week for cutaneous form or
3. Procaine penicillin for 14 days or single dose of Benzathin penicillin

Primary goal of antibiotic therapy for patients or carriers is to eradicate C. diphtheriae and prevent transmission from the patient to susceptible contacts.

Prevention and control

1. Educate the public, and particularly the parents of young children, of the hazards of diphtheria and the necessity for active immunization.
2. Immunization of infants with diphtheria toxoid.
3. Concurrent and terminal disinfection of articles in contact with patient and soiled by discharges of patient.
4. Single dose of penicillin (IM) or 7-10 days course of Erythromycin (PO) is recommended for all persons exposed to diphtheria.

4.7 Pertusis (whooping cough)

Definition

An acute bacterial disease involving the respiratory tract.

Infectious agent

Bordetella pertusis

Epidemiology

Occurrence- An endemic disease common to children especially young children everywhere in the world. A marked decline has occurred in incidence and mortality rates during the past four decades. Outbreaks occur periodically. Endemic in developing world and 90% of attacks occur in children under 6 yearsof age.

Reservoir- Humans

Mode of transmission- Primarily by direct contact with discharges from respiratory mucus membranes of infected persons by airborne route, probably by droplets. Indirectly by handling objects freshly solid with nasopharyngeal secretions.

Incubation period- 1-3 weeks

Period of communicability- Highly communicable in early catarrhal stage before the paroxysmal cough stage. The most contagious disease with an attack rate of 75-90%. Gradually decreases and becomes negligible in about 3 weeks. When treated with erythromycin, infectiousness is usually 5 days or less after onset of therapy.

Susceptibility and resistance- Susceptibility to non-immunized individuals is universal. One attack usually confers prolonged immunity but may not be lifelong.

Clinical manifestation

The disease has insidious onset and 3 phases:

1. Catarrhal phase
   - Lasts 1-2 weeks
   - Cough and rhinorrhea
2. Paroxysmal phase
   - Explosive, repetitive and prolonged cough
   - Child usually vomits at the end of paroxysm
   - Expulsion of clear tenacious mucus often followed by vomiting
   - Whoop (inspiratory whoop against closed glottis) between paroxysms.
   - Child looks healthy between paroxysms
   - Paroxysm of cough interferes with nutrition and cough
   -

3. Convalescent phase
   - Á The cough may diminish slowly or may last long time.
   - Á After improvement the disease may recur.

Diagnosis

- Á Difficult to distinguish it from other URTI
- Á History and physical examination at phase two (paroxysmal phase) ensure the diagnosis.
- Á Marked lymphocytosis.

Treatment

1. Erythromycin- to treat the infection in phase one but to decrease transmission in phase two
2. Antibiotics for super infections like pneumonia because of bacterial invasion due to damage to cilia.

Nursing care

1. Proper feeding of the child.
2. Encourage breastfeeding immediately after an attack (each paroxysm).
3. Proper ventilation- continuous well humidified oxygen administration.
4. Reassurance of the mother (care giver),

Prevention and control

1. Educate the public about the dangers of whooping cough and the advantages of initiating immunization at 6 weeks of age.
2. Consider protection of health workers at high risk of exposure by using erythromycin for 14 days.

4.8 Pneumococcal pneumonia

Definition

An acute bacterial infection of the lung tissue and bronchi.

Infectious agent

Streptococcus pneumoniae (pneumococcus)

Epidemiology

Occurrence- Endemic particularly in infancy, old age and persons with underlying medical conditions. Epidemics can occur in institutions, barracks and on board ship where people

Mode of transmission- droplet spread, direct oral contact or indirectly through articles freshly soiled with respiratory discharges. Person to person transmission is common.

Incubation period- not well determined, may be as short as 1-3 days.

Period of communicability- Until discharges of mouth and nose no longer contain virulent pneumococci in significant number.

Susceptibility and resistance- Susceptibility is increased by influenza, pulmonary edema of any cause, aspiration following alcohol intoxication, chronic lung disease, exposure to irritants in the air, etc. Malnutrition and low birth weight are important risk factors in infants and young children in developing countries. Immunity following an attack may last for years.

Clinical Manifestation

- Sudden onset of chill, fever, pleural pain, dyspnea, tachypnea, a cough productive of rusty sputum,
- Chest indrawing, shallow and rapid respiration in infants and young children.
- Vomiting and convulsion may occur in infants and young children.

Diagnosis

- Based on clinical grounds
- Chest X-ray- reveals consolidation of the affected lung tissue but not in children.
- Sputum gram stain- reveals gram negative diplococci

Treatment

1. Antipyretic and antipain
2. Antibiotics like Ampicillin or procaine penicillin for adults but usually crystalline penicillin for children
3. Anticonvulsants for infants.

Nursing care

1. Monitor vital signs especially of children.
2. Maintain high body temperature to normal.
3. Intermittent administration of humidified oxygen if indicated especially for young children.
4. Timely administration of ordered medication.

Prevention and control

1. Treatment of cases
2. Treatment of other underlying medical conditions
3. Improved standard of living (adequate and ventilated housing and better nutrition)
4. Avoid overcrowding.

4.9 Meningococcal Meningitis

Definition

An acute bacterial disease that causes inflammation of the pia and arachnoid space.

Infectious agent

Neisseria meningitides (the meningococcus)

Epidemiology

Occurrence- Greatest incidence occurs during winter and spring. Epidemics occur irregularly. Common in children and young adults. It is also common in crowded living conditions.

Reservoir- Humans

Mode of transmission- Direct contact with respiratory droplets from nose and throat of infected person.

Incubation period- 2-10 day, commonly 3-4 days.

Period of communicability- as long as the bacteria is present in the discharge.

Susceptibility and resistance- Susceptibility is low and decreases with age

Clinical Manifestation

- Sudden onset of fever, intense headache, nausea and often vomiting, neck stiffness and frequently, petechial rash with pink macules.
-

3. Timely administration of antibiotics
4. Monitor vital signs.

Prevention and control

1. Educate the public on the need to reduce direct contact and exposure to droplet infection.
2. Reduce overcrowding in work places, schools, camps, etc.
3. Vaccines containing group A,C and Y strains.
4. Chemotherapy of cases.
5. Chemo prophylaxis (e.g.Rifampin for 2 days)
6. Report to the concerned health authorities.

4.10 Tuberculosis

Definition

A chronic and infectious mycobacterial disease important as a major cause of illness and death in many parts of the world.

Infectious agent.

Mycobacterium tuberculosis- human tubercle bacilli (commonest cause)

Mycobacterium bovis- cattle and man infection

Mycobacterium avium- infection in birds and man.

Epidemiology

Occurrence- Worldwide, however underdeveloped areas are

milk transmits bovine tuberculosis. Overcrowding and poor housing conditions favor the disease transmission.

Incubation period- 4-12 weeks

Period of communicability- as far as the bacilli is present in the sputum

Susceptibility and resistance- under 3 years old children, adolescents, young adults, the very old and the immuno-

TB lymph adenitis

- Slowly developing and painless enlargement of lymph nodes followed by matting and drainage of pus.

Tuberculosis pleurisy

- Pain while breathing in, dull lower chest pain, slight cough, breathlessness on exertion.

TB of bones and joints

- Localized pain and/or swelling, discharging of pus, muscle weakness, paralysis and stiffness of joints.

Intestinal TB

- Loss of weight and appetite
- Abdominal pain, diarrhea and constipation
- Mass in the abdomen
- Fluid in the abdominal cavity (ascites)

Tuberculos meningitis

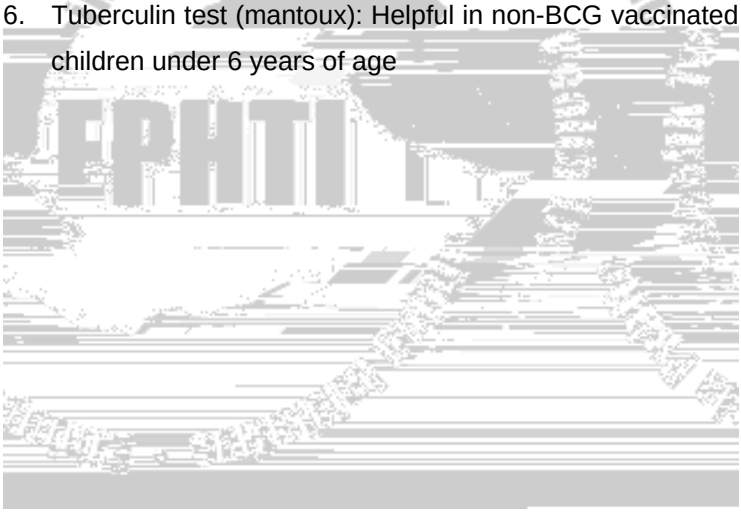
- Headache, fever, vomiting, neck stiffness and mental confusion of insidious onset.

Diagnosis

1. Clinical manifestations
2. Sputum smears for acid-fast bacilli (AFB), which is the Golden standard. However, one positive result does not

justify starting anti TB treatment since errors can never be excluded.

3. Acid-fast stain for AFB can be done for extra pulmonary tuberculosis having pus-y discharge.
4. Radiological examination: This is unreliable because it can be caused by a variety of conditions or previous TB patients who are healed may have chest x-ray giving the appearance of active TB, which requires treatment.
5. Histopathological examination: Biopsies for extrapulmonary TB (e.g. Tuberculos lymphadenitis)
6. Tuberculin test (mantoux): Helpful in non-BCG vaccinated children under 6 years of age



All drugs, except streptomycin, which is administered daily through in route) are to be taken orally as a single daily dose preferably on an empty stomach.

Drug regimens (prescribed course of therapy)

1) Short course chemotherapy regimen
   - (DOTS) intensive phase- S(RH)Z for two months
   - Continuation phase- TH (EH) for the next 6 months.
2) Long course chemotherapy regimen.
   - Intensive phase- S(TH)or S(EH) for 2 months
   - Continuation phase-TH or EH for the next 10 months

Nursing care

1. Educate the patient how and when to take the prescribed medication.
2. Tell the patient not to stop the medication unless he/she is told to do so.
3. Tell the patient to come to the health institution if he/she develops drug side effects.
4. Advice the patient on the importance of taking adequate and balanced diet and to eat what is available at home.

Prevention and control

1. Chemotherapy of cases
2. Chemoprophylaxis for contacts

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Epidemiology

Occurrence- Although common in rural tropics and

Susceptibility and resistance- The presence and form of leprosy depend on the ability to develop effective cell-mediated immunity.

Clinical Manifestation

Clinical manifestations vary between two polar forms: **lepromatous** and **tuberculoid** leprosy.

Lepromatous (Multibacillary form)

Nodules, papules, macules and diffused infiltration are bilaterally symmetrical and usually numerous and extensive. Involvement of the nasal mucosa may lead to crusting, obstructed breathing and epistaxis. Occular involvement leads to iritis and keratitis.

Tuberculoid (Paucibacillary form)

Skin lesions are single or few, sharply demarcated, anesthetic or hyperesthetic and bilaterally symmetrical. Peripheral nerve

Diagnosis

- Complete skin examination (hyperesthesia, anesthesia, paralysis, muscle wasting or trophic ulcer which are signs of peripheral nerve involvement) with bilateral palpation of peripheral nerves (ulnar nerve at the elbow, peroneal nerve at head of fibula and the great auricular nerve) for enlargement and tenderness.
- Skin lesion are tested for sensation (light touch, pink prick, temperature discrimination).
- Demonstration of AFB in skin smears made by scraped incision method.
-

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CHAPTER FIVE

ARTHROPOD OR INTERMEDIATE VECTOR-BORNE DISEASES

5.1 Learning Objectives

At the end of this chapter, the student will be able to:

- Describe what arthropod or intermediate vector-borne disease means.
- Identify the common vectors which transmit disease to man.
- List the common vector-borne diseases.
- Participate in diagnosis and treatment of vector-borne diseases.
- Implement the common preventive and control methods of vector-borne diseases.

5.2 Introduction

Generally speaking a vector is any carrier of disease, but in the case of the 'vector-borne diseases' we restrict the word to those invertebrate hosts (insects or snails), which are an

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Infectious agent.

- Plasmodium falciparum/malignant tertian: Invades all ages of red blood cells. Red blood cell cycle is 48 hours
- Plasmodium vivax/benign tertian: Invades reticulocytes only. Red blood cell cycle is 48 hours.
- Plamodium ovale/tertian: Invades reticulocytes only. Red blood cell cycle is 48 hours.
- Plasmodium Malariae/Quartan malaria: Invades reticulocytes only. Red blood cell cycle is 72 hours.

Epidemiology

Occurrence- Endemic in tropical and sub-tropical countries of the world. Affects 40% of the world population. Children less 5 years of age, pregnant women and travelers to endemic areas are risk groups. Plasmodium falciparum 60% and vivax 40% are common in Ethiopia.

Predisposing factors are:

- Environment- physical environment for the propagation
- Patient source
- Susceptible recipients
- Anopheles capable to transmit the parasite
- Socio-economic factors like immigration, war, poverty, ignorance, agricultural irrigation farms, etc.

Reservoir- Humans

- Duffy blood group deficiency (Duffy antigen negative red blood cells) lack receptor for plasmodium vivax.
- Because of passive immunity infants are resistant in early life.

Specific factors

This is a humoral and cell mediated immunity that is species and strain specific, and hard-won after repeated infection.

Life cycle

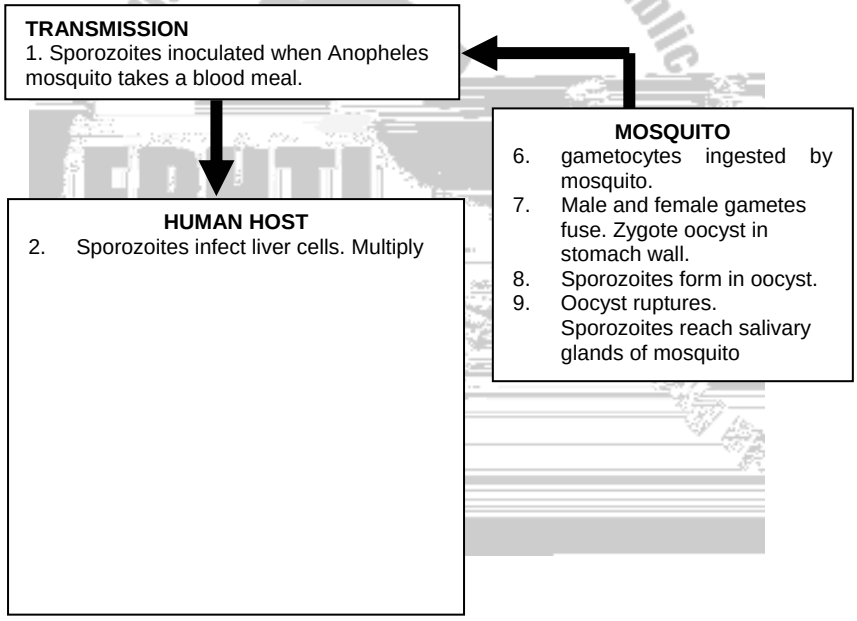

Fig. 5.1 Transmission and life cycle of Malaria parasites. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

Chills, rigor, fever, head ache, diarrhea, hallucinations, abdominal pain, aches, renal or respiratory symptoms, jaundice, etc.

Diagnosis

- Clinical manifestation and epidemiological grounds
- Blood film for hemoparasite
- White blood cell count
- Blood culture to rule out sepsis
- Chest X-ray to rule out pneumonia.

Treatment

1. Plasmodium vivax, ovale and sensitive plasmodium falciparum
   - Chloroquine or
   - Fansidar
2. Chloroquine resistant falciparum and when sensitivity pattern is not known.
   - Quinine or
   - Fansidar

Nursing care

1. Advise patient to come back if the illness gets severe.
2. Advise on personal protection (bed nets, etc).
3. Reduce fever and maintain comfort.

Prevention and control

1. Chemoprophylaxis- for those who go to endemic areas but not for those who live in the endemic area (travelers

Epidemiology

Occurrence- Widely prevalent in tropical and subtropical areas of Africa, Asia, Pacific Region, Central and South America. Found in Gambella region (western Ethiopia).

Reservoir- Humans are definitive hosts.

Mode of transmission- by bite of mosquito harboring infective larvae

Incubation period- one month, while allergic inflammatory manifestations may appear.

Period of communicability- Humans may infect mosquitoes when microfilariae are present in the peripheral blood. Microfilaremia may persists for 5-10 years or longer. The mosquito becomes infective about 12-14 days after an infective blood meal.

Susceptibility and resistance- Universal. Susceptibility to infection is probable.

Life cycle

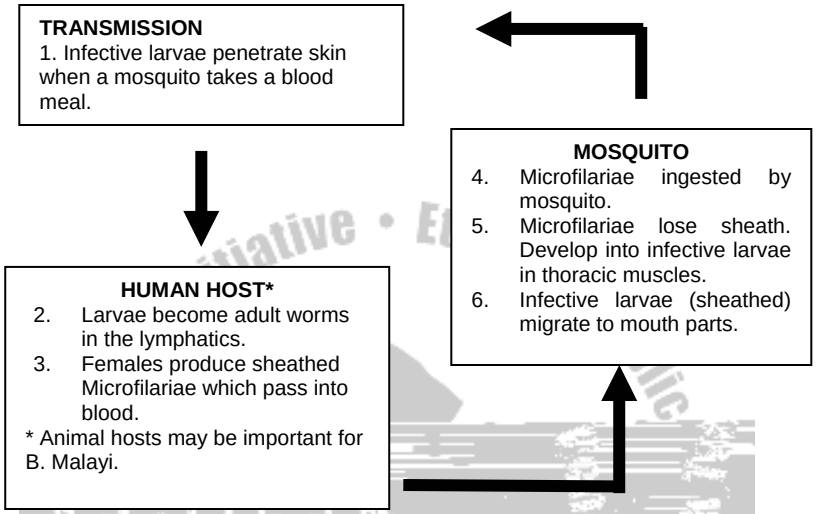

Fig. 5.2 Transmission and life cycle of W. bancrofti and Brugia species (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

The presence of worms in the lymph vessels gives rise to a foreign-body reaction. After the death of the worm, more proteins are released; the reaction then is even more severe. Three phases may be distinguished.

Acute phase:

- Starts within a few months after infection
- Lymphadenopathy
- Fever

- Eosinophilia
- In this stage microfilariae are not demonstrable in the peripheral blood because the worms are not yet mature. The acute phase is mainly due to a hypersensitivity reaction.

Subacute phase:

-

N:B

Treatment

1. Diethyl carbamazin Citrate (DEC) results in rapid disappearance of most microfilariae from blood but may not destroy the adult worm. Because of this, we need to repeat DEC annually for some years.
2. Refer the patient for surgical treatment of hydrocele.

Prevention and control

1. Reducing the vector population
2. Mass and selective treatment
3. Personal protection against mosquito bite.

5.3.3 Yellow fever

Definition

An acute infectious viral disease of short duration and varying severity.

Infectious agent

Yellow fever virus

Epidemiology

Occurrence- The disease exists in two transmission cycles. Namely, the sylvatic or Jungle cycle, which occurs between mosquitoes and non-human primates, and an urban cycle,

involving Aedes aegypti mosquitoes and humans. Found in southwest Ethiopia (Gambella region).

Reservoir- Urban areas- humans and Aedes aegypti mosquitoes. Forest areas- Vertebrates other than humans (mainly monkeys) and forest mosquitoes.

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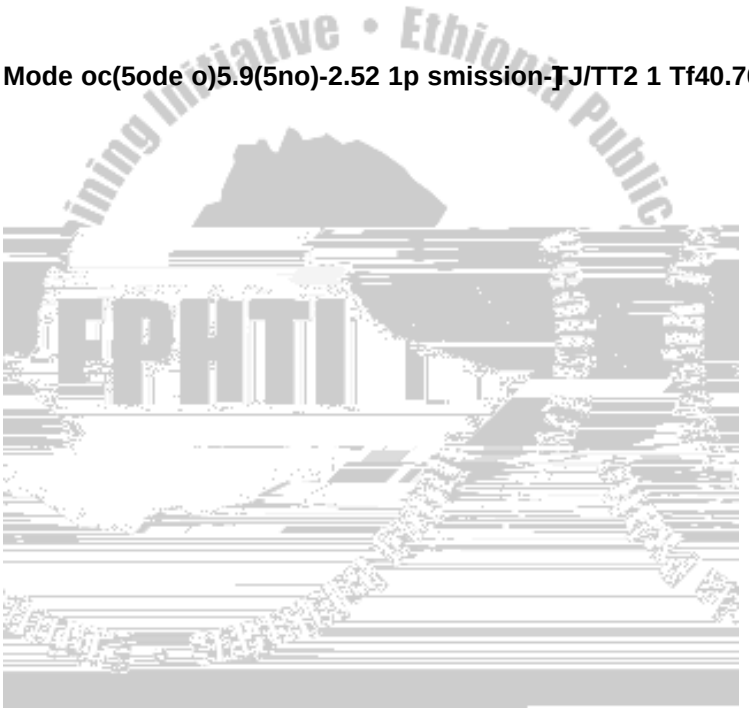

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Clinical Manifestation

- Typical attacks are characterized by sudden onset of fever, chills, headache, backache, generalized pain, prostration, nausea and vomiting.
- Slow and weak pulse.
- Bleeding tendency is common resulting in epistaxis, bleeding of gums, hematemesis, melaena.
- Jaundice occurs due to liver cell necrosis and this may result in liver failure and death.
- Albumin uria occurs due to nephrosis and this may result in kidney failure and anuria.
- Patients surviving the seventh day of the disease usually recover.

Diagnosis

- History of residence and/or travel to endemic area
- Clinical manifestation

Treatment

- No specific treatment.

Nursing care

1. Monitor vital signs regularly.
2. Maintain body temperature to normal.
3. Monitor input and output balance.
4. Keep patient in screened rooms or under mosquito nets to avoid further infection.

Prevention and control

1. Active immunization of all people greater than 9 months of age necessarily exposed to infection because of residence, occupation or travel.
2. Eradication or control of Aedes aegypti mosquitoes in urban areas.
3. Sylvatic /Jungle yellow fever- immunization to all people in rural communities whose occupation brings them into forests in yellow fever areas and for people who visit those areas.
4. Notification of the disease to the concerned health authorities.

5.4 Flea-Borne Diseases

5.4.1. Plague

Definition

A highly infectious bacterial disease which can kill many people within a short time.

Infectious agent

Yersinia pestis, the plague bacillus.

Epidemiology

Occurrence- Endemic in wild rodents living in forests in the highlands. Wild rodent plague exists in western USA, large

areas of South America, North, Central, Eastern and Southern Africa, Central and Southeast Asia. However, urban plague is controlled in most of the world.

Reservoir-

Clinical Manifestation

Bubonic plague- Characterized by swelling of lymph glands (bubos); mostly the glands of the groins, sometimes arm pit or other places. Swelling may be the size of an egg, tender or non-tender. Other symptoms are:

- Sudden high fever
- Shock
- Prostration
- Coma
- Death within 3-5 days

Pneumonic plague

- Acute onset
- Severe prostration
-

Prevention and Control

1. Chemotherapy of patient
2. Chemoprophylaxis of all contacts with Sulfa drugs
3. The area where disease occurs must be quarantined (isolated from outer world)
4. Insecticides to kill fleas
5. Encourage people to kill rats
6. Notify the disease to the concerned health authority.

5.4.2 Endemic Typhus (Flea-borne typhus)

Definition

A rickettsial disease whose course resembles that of louse-borne typhus, but is milder.

Infectious agent

Rickettsia typhi (Rickettsia mooseri)

Epidemiology

Occurrence- Worldwide, found in areas where people and

Mode of Transmission- Infective rat fleas defecate rickettsia while sucking blood, contaminating the bite site and other fresh skin wounds. An occasional case may follow inhalation of dried infective flea feces.

Incubation period- from 1 to 2 weeks; commonly 12 days

Period of communicability- Not directly transmitted from person to person. Once infected, fleas remain so for life.

Susceptibility and resistance- Susceptibility is general. One attack confers immunity.

Clinical Manifestation

- Prodromal symptoms of headache, myalgia, arthralgia, nausea, and malaise developing 1 to 3 days before the abrupt onset of chills and fever. Nearly all patients experience nausea and vomiting early in the illness.
- The duration of untreated illness averages 12 days.
- Rash is present in only 13% of patients
- Pulmonary involvement: non-productive cough and pneumonia.

Diagnosis

- Epidemiological ground
- Weilfelix agglutination test (Serology)

Treatment

1. Doxycyclin or
2. Chloramphenicol

Prevention and control

1. Destroy rats from burrows and harborages.
2. Use insecticides to abolish flea from livingquarters.
3. Treatment of patients.

5.5 Louse-Borne Diseases

5.5.1 Epidemic Typhus

Definition

An acute rickettsial disease often with sudden onset.

Infectious agent

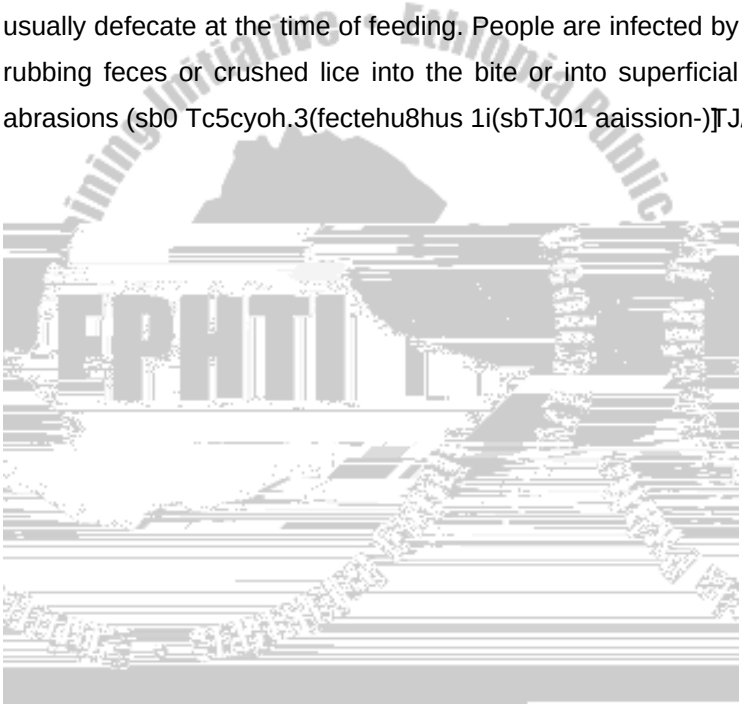
Rickettsia Prowazeki

Epidemiology

Occurrence- In colder areas where people may live under unhygienic conditions and are louse-infected. Occurs sporadically or in major epidemics, for example during wars or famine, when personal hygiene deteriorates and body lice flourish.

Reservoir- Humans. Infected lice die and don't serve as a reservoir.

Mode of transmission- The body louse and head louse are infected by feeding on the blood of a patient with acute typhus fever. Infected lice excrete rickettsiae in their feces and usually defecate at the time of feeding. People are infected by rubbing feces or crushed lice into the bite or into superficial abrasions (sb0 Tc5cyoh.3(fectehu8hus 1i(sbTJ01 aaission-)]TJ/S Tcabra64(1.75.3period.2(n)0(smis



- Patient may have pneumonia, renal or CNS involvement, gastrointestinal disease, skin rash singly or in combination.
- Disease usually terminates by rapid lysis after 2 weeks of fever.

Diagnosis

- Based on clinical and epidemiologic grounds
- Serologic test (weil-felix agglutination test)

Treatment

1. Chloramphenicol or Tetracycline

Prevention and control

1. Delousing of clothes by insecticides or dipping into boiling water
2. Public education on personal hygiene
3. Treatment of cases
4. Chemoprophylaxis for contacts.

5.5.2 Relapsing Fever

Definition

An acute infectious bacterial disease characterized by alternating febrile periods (recurrent pyrexial attacks).

Infectious agent

Borrelia recurrentis- cause of louse-borne relapsing fever

Borrelia duttoni-cause of tick-borne relapsing fever

Epidemiology

Occurrence- Occurs in Asia, eastern Africa (Ethiopia and Sudan), the highland areas of central Africa and South America. It occurs in epidemic form when it is spread by lice and in endemic form when spread by ticks.

Reservoir- Humans for Borrelia recurrentis; , wild rodents and soft ticks through transovarian transmission. for tick borne relapsing fever

Mode of transmission- vector-borne. Acquired by crushing an infected louse so that it contaminates the bite wound or an abrasion of the skin.

Incubation period- 5-10 days usually 8 days.

Period of communicability- Louse becomes infective 4-5 days after ingestion of blood from an infected person and remains so for life (20-40 days)

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Nursing care

Infectious agent

The major schistoma species that cause schistosomiasis of humans are:

Schistosoma mansoni

Schistosoma Japonicum

Schistosoma Hematobium

Others in limited areas are S. mekongi, S. intercalatum, S. malayesis, S. mattheei.

Most prevalent species in Africa are S. mansoni and S. hematobium.

Snail vectors are:

- Bulinus-S. hematobium
- Biomphalaria-S. mansoni
- Onchomelania-S. japonicum

Epidemiology

Occurrence- S. mansoni is found in South America, Caribbean Islands, Africa and the Middle East. S. hematobium is found in Africa and the Middle East. S. Japonicum is found in the Far East. The disease occurs worldwide and 2 million people are expected to be infected; however, most infected individuals show few or no signs and symptoms, and only a

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Life cycle

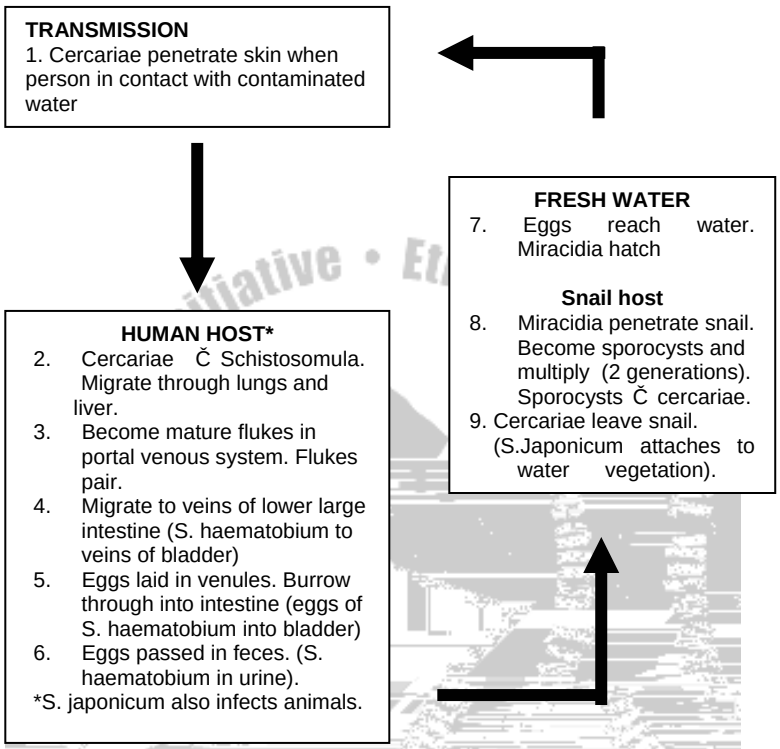

Fig. 5.3 Transmission and life cycle of Schistosoma species. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

The stages of schistosomiasis are:

A. invasion

B. maturation

C. established infection and

D. late stage.

A. Invasion stage

- Cercariae penetrate skin
- Cercarial dermatitis with itching papules and local edema
- Cercariae remain in skin for 5 days before they enter the lymphatic system and reach the liver.

B. Maturation

- Schistosoma mature in the liver.
- Fever, eosinophilia, abdominal pain and transient generalized urticaria (known as katayama syndrome)
- Worms descend the portal vein. S. manson; migrates to mesenteric veins in the intestinal wall and S. haematobium to bladder plexus.
- This stage may be diagnosed as clinical malaria or may pass unnoticed.

C. Established infection

- This is a stage of egg production and eggs reach to the lumen of bladder and bowel.
- Some eggs penetrate the tissue, reach the bladder and intestinal wall are discharged with urine and feces.
- Eggs that could not penetrate the tissue are carried with blood to the liver and lungs.
- Other eggs that fail to reach the lumen of the bladder or bowel provoke an inflammatory reaction.

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Praziquantel and oxamniquine are the drugs of choice but in Africa praziquantel is best because of resistance strain of oxamniquine.

Prevention and control

1. Treatment of cases
2. Intermittent irrigation
3. Drainage of water bodies
4. Clearing of vegetation in water bodies to deprive snails of food and resting place
5. Flooding
6. Straightening and deepening margins of water bodies
7. Educating the public about the mode of transmission and ways of prevention
8. Proper disposal of human feces and urine
9. Avoid swimming in water bodies known to have the

Infections agent

Dracunculus medinensis, a nematode

Epidemiology

Occurrence- In Africa (16 countries south of the Sahara) and in Asia (India and Yemen) especially in regions with dry climates. Local prevalence varies greatly. In some locales, nearly all inhabitants are infected, in others, few, mainly young adults.

Reservoir- Humans

Mode of transmission- Larvae discharged by the female worm into stagnant fresh water are ingested by minute crustacean copepods (Cyclops species). In about 2 weeks, the larvae develop into the infective stage. People swallow the infected copepods in drinking water from infested step-wells and ponds. The larvae are liberated in the stomach, cross the duodenal wall, migrate through the viscera and become adults. The female, after mating, grows and develops to full maturity, then migrates to the subcutaneous tissues (most frequently of the legs).

Incubation period- About 12 months

Period of communicability- From rupture of vesicle until larvae have been completely evacuated from the uterus of the gravid worm, usually 2-3 weeks. In water, the larvae are infective for the copepods for about 5 days. After ingestion by copepods, the larvae become infective for people after 12-14 days at temperatures >25c^0 and remain infective in the copepods for about 3 weeks.

Susceptibility and resistance- Susceptibility is universal. No acquired immunity; multiple and repeated infections may occur in the same person.

Clinical Manifestation

- Few or no clinical manifestations are evident until just before the blister forms.
- Fever and generalized allergic symptoms, including periorbital edema, wheezing, and urticaria.
- The emergence of the worm is associated with local pain and swelling.
- When the blister ruptures, the adult worm releases larva-rich fluid and this is associated with a relief of symptoms.
- The shallow ulcer surrounding the emerging adult worm heals over weeks to months.

Diagnosis

- Based on clinical and epidemiological grounds

Treatment

1. Gradual extraction of the worm by winding of a few centimeters on a stick each day remains the common and effective practice. Worms may be excised surgically.
2. Administration of thiabendazole or metronidazol may relive symptoms but has no proven activity against the worm.

Prevention and control

1. Provide health education programs in endemic communities to covey three messages:
   - Á The guinea-worm infection comes from their drinking water
   - Á Villagers with blisters or ulcers should not enter any source of drinking water and
   - Á That drinking water should be filtered through fine

Review Questions

1. What do you understand by vector-borne disease transmission?
2. Which of the vector-borne diseases pose major health problems in Ethiopia?
3. Except one, others do not require notification to the health authorities
   a) Malaria
   b) Yellow fever
   c) Plague
   d) B and C
   e) Schistosomiasis
4. What are the preventive and control methods for malaria and schistosomiasis?

CHAPTER SIX

SEXUALLY TRANSMITTED DISEASES

6.1 Learning Objectives

At the end of this chapter, the student will be able to:

- List the common sexually transmitted diseases (STDs).
- Identify the diagnostic symptoms of sexually transmitted diseases.
- Identify sexually transmitted diseases that are transmitted through vertical route.
- Apply the management of sexually transmitted diseases.
- State the preventive and control measures for sexually transmitted diseases.

6.2. Introduction

The diseases belonging to this group are usually transmitted during sexual intercourse; hence the name sexually transmitted diseases or STDs. During sexual intercourse there is close body contact, which is an ideal situation for

transmission. The causative organisms of the STDs are very easily killed by drying or by cooling to below body temperature. Therefore transmission of these agents from one person to another can only occur under very special circumstances, mostly during sexual intercourse. STDs are very common in adults, but they are often hidden for fear of the opinion of others. Single young men are a high–risk group for STDs, as they satisfy their sexual needs with women who have many sexual partners (promiscuity). They may be professional prostitutes, barmaids, or persons who in other ways gain from casual sexual relationships. This group is called the promiscuous women pool (PWP). They are the reservoir of STDs.

Risk factors are:

1. Age: 15 years and older
2. Marital status: unmarried people who often change their sexual partners are more frequently exposed. Most of the women in the PWP are unmarried or divorced.
3. Occupation: soldiers, policemen, students, seasonal laborers, and other people who are temporarily away from home tend to expose themselves more easily.
4. Residence: Due to industrialization and consequent urbanization there is usually a large group of single young men in towns. Women in towns may have more difficulty

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Incubation period– 10 days to 3 months, usually 3 weeks.

b) **Secondary syphilis** - After 4 – 6 weeks of the primary infection, a generalized secondary eruption appears, often accompanied by mild constitutional symptoms. These early rashes tend to be symmetrical, quickly passing, and

Treatment

1. Primary and secondary syphilis

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6.4 Chancroid (soft chancre)

Definition

An acute bacteria infection localized in the genital area and characterized clinically by single or multiple painful narcotizing ulcers at the site of infection.

Infectious agent.

Haemophilus ducreyi, the Ducrey bacillus

Epidemiology

Occurrence – endemic in many developing countries. The commonest cause of genital ulcer in many developing counties. Most frequently diagnosed in men, especially those who frequently prostitutes.

Reservoir – Humans

Mode of transmission – by direct sexual contact with discharges from open lesion and pus from buboes. Infected males don't pass the infection farther because of the painful ulcer.

Incubation period – from 3 to 5 days, up to 14 days after sexual contact.

Period of communicability – until healed and as long as the infectious agent persists in the original lesion or discharging

regional lymph nodes, which lasts for several weeks or months without antibiotic treatment. Antibiotic therapy eradicates H. ducreyi, and lesions heal in 1 – 2 weeks.

Susceptibility and resistance – Susceptibility is general. The uncircumcised are at higher risk than the circumcised. No evidence of natural resistance.

Clinical manifestation

- Classic Chancroid ulcer begins as a tender papule that ulcerates within 24 hours.
- The ulcer is painful, irregular and sharply demarcated from the nearby skin.
- About 50% of men will have single ulcer.

Diagnosis

- Clinical, but always rule out syphilis
- Gram stain of smear from ulcer shows typical rods in chain
- Culture.

Treatment

1. Co- trimorazele or
2. Erythromycin or
3. Tetracycline can be used

N.B. Do not incise lymph nodes even with fluctuation because they will completely heal with treatment.

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Mode of transmission- Direct contact with open lesions of infected people, usually during sexual intercourse.

Incubation period – variable, with a range of 3 – 30 days for a primary lesion.

Period of communicability – variable, from weeks to years, during presence of active lesions.

Susceptibility and resistance – Susceptibility is general. Status of natural or acquired resistance is unclear.

Clinical manifestation

- Lymph adenopathy with non-specific symptoms of fever, chills, head ache, malaise, anorexia and weight loss.
- Regional lymph nodes undergo suppuration followed by extension of inflammatory process to the adjacent tissues.
- In the female, inguinal nodes are less frequently affected and involvement is mainly of the pelvic nodes with extension to the rectum and recto vaginal septum, resulting in proctitis, stricture of the rectum and fistula.
- Elepthantiasis of genitalia, scrotum and vulva occur in either sex.

Diagnosis

- Clinical presentation (i.e. presence of bubo.)
- Culture of bubo aspirate.

Treatment

1. Tetracycline or
2. Erythromycin or
3. Co -trimoxazole can be used
4. Aspiration of fluctuating bubo and wound care

Prevention and control

1. Early diagnosis and treatment of cases
2. Investigation of contacts, source of infection and treatment
3. Controll STDs among commercial sex workers
4. Sex education for high risk groups

6.6 Herpes Genitalia

Definition

A viral infection characterized by a localized primary lesion, latency and a tendency to localized recurrence.

Infectious agent

Herpes simplex virus (HSv) type 2

Epidemiology

Occurrence – worldwide. HSV 2 infection usually begins with sexual activity and is rare before adolescence, except in sexually abused children. Prevalence is greater (up to 60%) in

lower socio-economic groups and persons with multiple sexual partners.

Reservoir – Humans**.**

Mode of transmission - Usually by sexual contact. Transmission to the neonate usually occurs via the infected birth canal, but less commonly occurs intrauterine or postpartum

Incubation period – 2 – 12 Days

Period of communicability – Patients with primary genital lesions are infective for about 7 –12 days, with recurrent disease for 4 days to a week. Reactivation of genital herpes

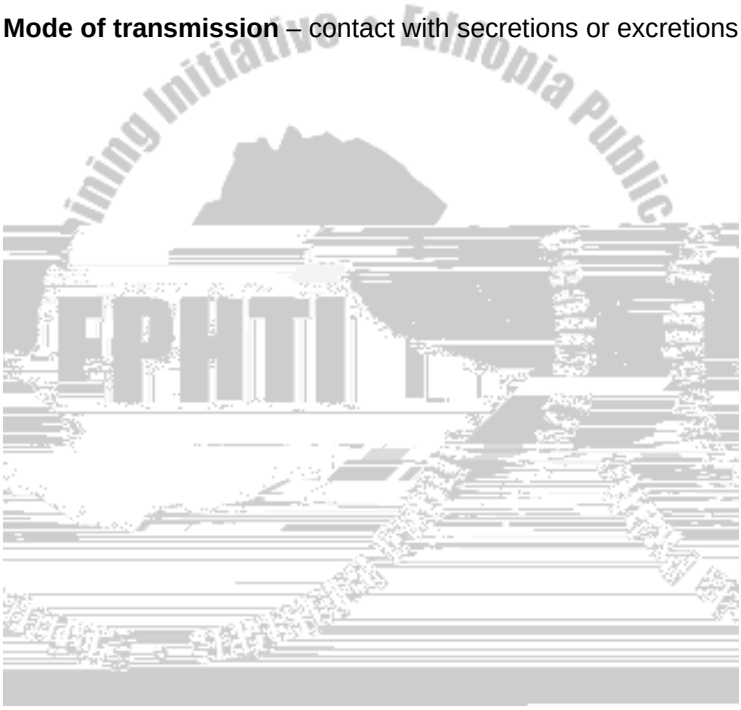
Á Widely-spaced bilateral lesions of the external genitalia are characteristic: lesions may be vesicles, pustules, or painful erythematous ulcers.

Epidemiology

Occurrence – Worldwide. Candida albicans is often part of the normal human flora.

Reservoirs – Humans

Mode of transmission – contact with secretions or excretions



- vaginal epithlium bleeds when the plug is removed but the cervix is normal

Diagnosis

- Based on clinical grounds
- Microscopic demonstration of pseudohyphae or yeast cells in infected tissue or body fluids (vaginal discharge)
-

Epidemiology

Occurrence – worldwide, affecting both genders, especially sexually active adolescents and young adults. Common in rural areas. Prevalent in communities of lower socio-economic status. In most industrialized countries, the incidence has decreased during the past two decades.

Reservoir - Strictly a human disease

Mode of transmission - almost always as a result of sexual activity

Incubation period - usually 2-7 days

Period of communicability - may extend for months in untreated individuals. Effective therapy ends communicability within hours.

Susceptibility and resistance - Susceptibility is general. No immunity following infection and reinfection is common.

Clinical manifestations

Males- Usually involves the urethra resulting in purulent discharge, dysurea and frequency.

Females - Females are usually asymptomatic. Vaginal discharge is common. Most common site of infection is cervix, followed by urethra, anal canal and pharynx. Bartholinitis occurs unilaterally. Salpingitis as a complication

occurs in 20% of women. Neonates borne to infected mothers develop a purulent discharge which exudes from between eyelids which are edematous and erythematous 2 -3 days postpartum.

Diagnosis

- Gram stain of discharge (urethral, cervical, conjuctival discharge)
- Culture on selective media

Treatment

1. Co - trimoxazole or
2. Erythromycin or
3. Ceftriaxone can be used

Prevention and control

1. The same as syphilis
2. Application of 1% tetracycline in both eyes of newborne as soon as delivered.

6.9 Trichomoniasis

Definition

A common and persistent protozoal disease of the genito-urinary tract.

Infectious agent

Trichomonas vaginalis, a flagellate protozoan

Epidemiology

Occurrence - worldwide spread, a frequent disease of all continents and all races, primarily of adults, with the highest incidence among females 16 - 35 years. Overall, about 20% of females may become infected during their reproductive years.

Reservoir - Humans.

Mode of transmission- by contact with vaginal and urethral discharges of infected people during sexual intercourse. Indirectly through contact with contaminated articles and clothes.

Incubation period - 4 - 20 days, average 7days. Many are symptom-free carriers for years.

Period of communicab Th(s)ii conp5ar

Á Infection in women is usually symptomatic and manifests with malodorous vaginal discharge often yellow, vulvar erythema and itching dysuria or urinary frequency (in 30 - 50% of cases) and dyspareunia. These manifestations don't clearly distinguish trichomoniasis from other types of infections/vaginitis.

Diagnosis

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6.10 HIV/AIDS

Definition

A severe, life - threatening clinical condition, first recognized as a distinct syndrome in 1981. This syndrome represents the late clinical stage of infection with the human immuno-deficiency virus (HIV), which most often results in progressive damage to the immune and other organ systems, including the CNS.

Infections agent

Human immuno-deficiency virus (HIV) (HIV-1 and HIV-2)

Epidemiology

Occurrence - worldwide spread pandemic. HIV -1 infections are now distributed worldwide, but are most prevalent in Sub-Saharan Africa, the Americas, western Europe and southern and Southeast Asia. HIV -2 has been found primarily in West Africa, with some cases in the western hemisphere and other African countries that are linked epidemiological to West Africa.

The MOH 2002 report depicts the following about the HIV/AIDS situation in Ethiopia:

- The HIV prevalence rate for the country as a whole is estimated at 6.66 percent.

- The estimated HIV prevalence rate for urban areas is 13.7 percent
- Prevalence rates for some urban centers other than Addis Ababa are much higher than the rate for Addis Ababa.
- The estimated rural prevalence rate is 3.7 percent, which is 25 percent of Addis Ababa's rate.
- HIV seems to be driving the TB epidemic in Ethiopia.
- The highest prevalence of HIV is seen in the age group 15 to 24.

The figure is worrying as it represents "recent" infections. Among the top ten leading causes of deaths, AIDS ranked 9th with 0.8% in 1993 E.C.

Reservoir - Humans

Mode of transmission – Mainly through sexual exposure and exposure to blood or tissues . Moreover, transplacental transmission from an infected mother to the fetus.

Incubation period- variable. Although the time from infection to the development of detectable antibodies is generally 1-3 months, the time from HIV infection to diagnosis of AIDS has an observed range of less than 1year to 10years or longer. About half of infected adults will have developed AIDS within 10 years after infection.

Period of communicability - unknown. Presumed to begin early after onset of HIV infection and extend throughout life.

Susceptibility and resistance - unknown, but susceptibility presumed to be general. Susceptibility is increased in the presence of other STDs, especially those with ulcerations.

Clinical manifestations

Acute HIV syndrome. Occurs 3 - 6 weeks after primary infection. Clinical findings in the acute syndrome are: fever, pharyngitis, lymphadenopathy, head ache, retro-orbital pain, arthralgias, myalgias, lethargy or malaise, anorexia, weight loss, nausea or vomiting or diarrhea. Meningitis, Encephalitis, peripheral neuropathy, myopathy, erythematous maculopupular rash, mucocutaneous ulceration.

Late complications of HIV infection

These result from opportunistic infections like pneumocystis carinii pneumonia, Tuberculosis, cryptococcal meningitis, etc.

Diagnosis

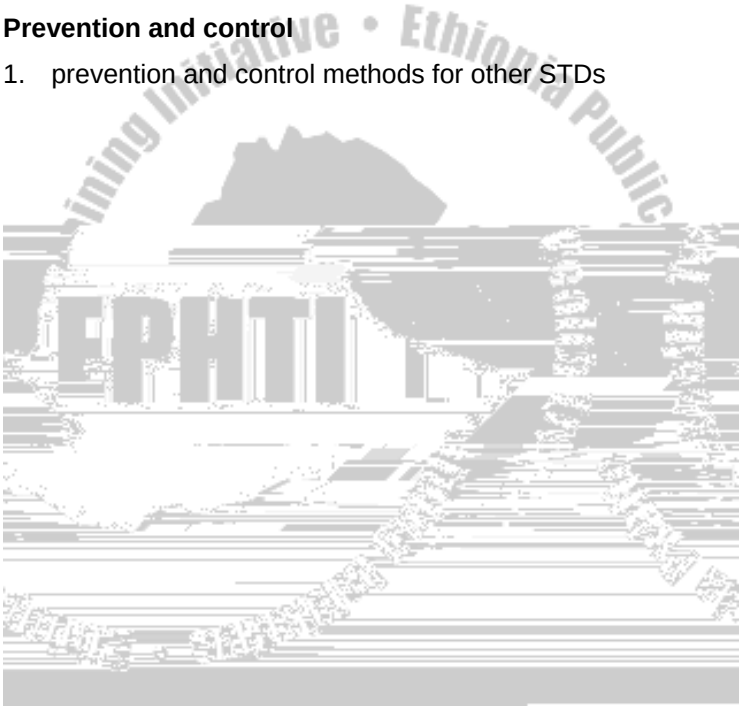
- Based on clinical ground in the late stage
- Based on serologic test in the early and late stage

Treatment

1. No specific treatment.
2. Treatment of opportunistic infections.
3. Use of anti-HIV drug to reduce transmission of the virus to the fetus of pregnant mothers reduces fetal infection.

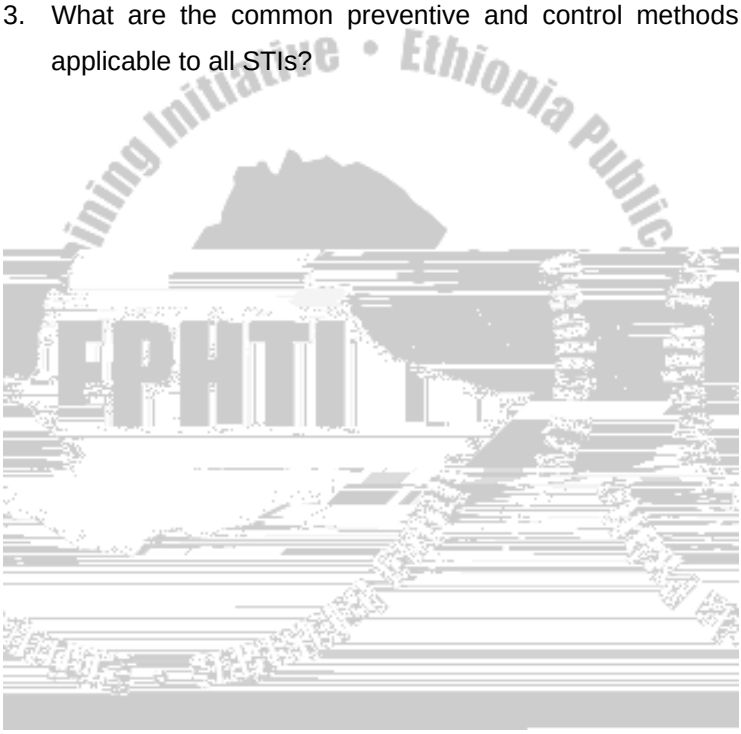
Prevention and control

1. prevention and control methods for other STDs



Review Questions

1. What are the common sexually transmitted infections?
2. What is the basic difference in the clinical manifestation of syphilis, Chancroid and Herpes genitalia?
3. What are the common preventive and control methods applicable to all STIs?



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bovis"; the larva stage of Taenia saginata. In humans, infection follows after ingestion of raw or under-cooked beef containing cysticerci; the adult worm develops in the intestine. Taenia Solium eggs to mouth of oneself or to another person or ingestion of food or water infected with eggs-embryos escape from the shells-penetrate the intestinal wall lymphatics or blood vessels and are carried to the various tissues where they develop to produce the human disease of cysticercosis.

Incubation period- 8-14 weeks, eggs appear in stool in both species.

Period of communicability- T. saginata is not directly transmitted from person to person but T. solium may be. Eggs of both species are disseminated into the environment as long as the worm remains in the intestine, sometimes more than 30 years. Eggs may remain viable in the environment for months.

Susceptibility and resistance- Susceptibility is general. No apparent resistance follows infection but more than one tapeworm in a person has rarely been reported.

Life cycle

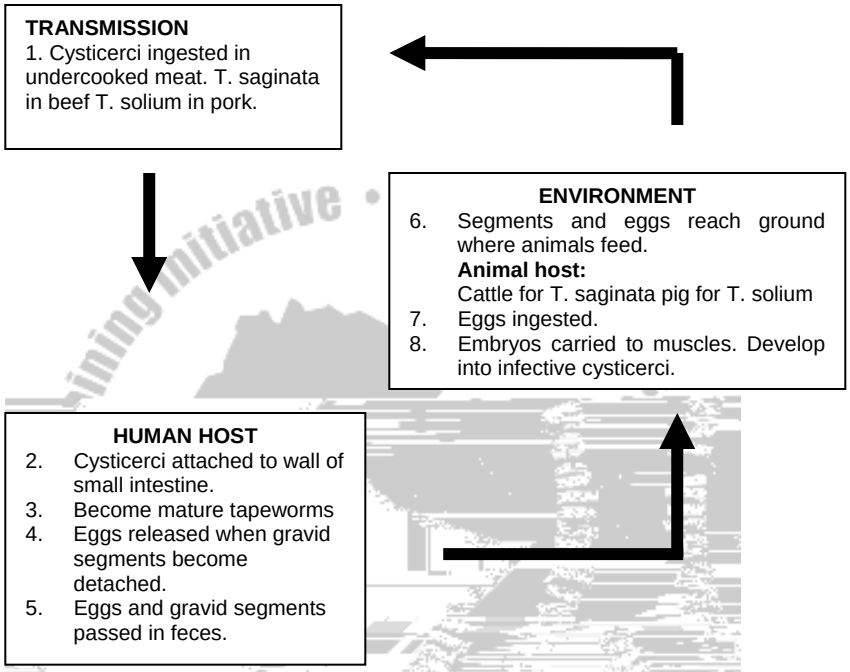

Fig.7.1 Transmission and life cycle of Taenia solium and Taenia saginata. (From Monica Chesbrough, 1998, District laboratory practice in tropical countries, part one, Cambridge University press, London.)

Cysticercosis: Infection with T. solium larvae can occur by ingesting eggs in food or from hands contaminated with feces. Eggs develop into cysticerci causing cysticercosis and neurocysticercosis**.**

Clinical manifestation (for both species)

- Symptoms of cysticercosis may appear after some days and stay for 10 years after infection.
- Passage of proglottidis (segmented adult worms) in the feces and perianal discomfort when proglottidis are discharged.
- Minimal or mild abdominal pain or discomfort, nausea, change in appetite, weakness and weight loss.
- Usually asymptomatic.
- Epigastric discomfort, nausea, a sensation of hunger, weight loss, nervousness, and anorexia.
- Passage of proglottidis.

Diagnosis

- Identification of proglottidis (segments)
- Eggs in feces or anal swab
- Cysticercus – palpable subcutaneous cysticercus and microscopic examination of an excised cysticercus confirms the diagnosis.
- Intracerebral and other tissues- CT scan, MRI or by x-ray when the cysticerci are calcified.

Treatment

1. Single dose of praziqantel is highly effective or
2. Niclosamide or
3. Dechlorophil or

4. Mebendazole or
5. Albendazole

T. Solium

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7.3.2 Brucellosis

Definition

A systemic bacterial disease with acute or insidious onset transmitted to humans from infected animals.

Infectious agent

Brucella melitensis (most common worldwide), acquired primarily from goats, sheep and camels.

B. abortus from cattle

B. suis from pigs

B. canis from dogs

These are small aerobic gram-negative bacilli, intracellular parasites.

Epidemiology

Occurrence- Worldwide. Predominantly an occupational disease of those working with infected animals or their tissues especially farm workers, veterinarians and abattoir workers, which is more frequent among males. Outbreaks can occur among consumers of raw milk and milk products, especially unpasteurized soft cheese from cows, sheep and goats.

Reservoir- cattle, swine, goats and sheep, pet dogs.

Mode of transmission- by contact with tissues, blood, urine,

- Some are acutely ill, with pallor, lymphadenopathy, hepatosplenomegally, arthritis, spinal tenderness, epididymoorchitis, skin rash, meningitis, cardiac murmurs, or pneumonia
- Reactive asymmetric polyartaritis (knees, hips, shoulders, sacroiliac and sternoclavicular joints)

Diagnosis

Á Exposure and consistent clinical features
Á Serology- raised levels of B. agglutinin
Á Blood or bone marrow culture

Treatments

Á Doxycyline + aminogrycoside for 2 weeks followed by Doxycycline + Rifampcin for 4-8 weeks is the most effective regimen.
Á In pregnancy and in children less than 7 years, Bacterium and Rifapcin for 8-12 weeks

N:B 4-14 days after the initiation of therapy, patients become afebrile and constitutional symptoms disappear but enlarged liver and spleen return to normal size within 2-4 weeks.

Prevention and Control

1. Control depends on elimination of the disease among domestic animals.

2. Educate people not to drink untreated milk or eat products made from untreated milk.
3. Educate farmers and slaughterhouse workers and those in meat processing plants and butcher shops as to the nature of the disease and the risk in the handling of carcasses and products of potentially infected animals.
4. Educate hunters to use barrier precaution (gloves and clothing).
5. Eliminate infected animals.
6. Pasteurize milk; cook meat and bone well.
7. Proper disposal of placenta, discharges or fetus from an aborted animal. Disinfect contaminated areas.

7.3.3 Trichinellosis or Trichinosis

Definition

A disease caused by an intestinal round worm whose larvae (trichinae) migrate to and become encapsulated in the muscles.

Infectious agent

Trichinella spiralis, an intestinal nematode

Epidemiology

Occurrence - Worldwide, but variable incidence, depending in part on practices of eating and preparing pork or wild animal meat.

Reservoir - swine, dogs, cats, horses, rats and many wild animals, including fox, wolf, etc.

Mode of transmission - By eating raw or insufficiently cooked flesh of animals containing viable encysted larvae, chiefly pork and pork products and "beef products" such ashamburger adulterated either intentionally or inadvertently with raw pork.

Incubation period - Systemic symptoms usually appear about 8 - 15 days after ingestion of infected meat.

Susceptibility and resistance - Susceptibility is universal. Infection results in partial immunity.

Clinical manifestation

- Symptoms result from invasion of the body by larvae produced by the adult female worm in the intestine and from their encystment in striated muscles.
- Infection ranges from symptomatic to mild febrile illness to a severe progressive illness with multiple system involvement.
- Fever (low - high grade)
- Muscle pain mainly upon movement
- Edema, and spasm (periorbital and facial)
- Photophobia and conjunctivitis

- Weakness or prostration
- Pain on swallowing
- Dyspnea, coughing and hoarseness
- Subconjuctival, retinal and nail splinter hemorrhage and rashes
- Diarrhea
- Abdominal cramps
- Nausea and vomiting

Inflammatory reactions around larvae that reach tissues other than muscles may result in:

- Meningitis
- Encephalitis
- Myocarditis
- Broncho-pneumonia
- Nephritis
- Peripheral and cranial nerve disorders

Diagnosis

- Meningitis

3. Albendazole or
4. Thiabendazole
5. High doses of corticosteroids for 1-2 days followed by lower doses for several days or weeks. But not for intestinal stage.

Prevention and control

1. Educate the public on the need to cook all fresh pork and pork products and meat from wild animals.
2. Freezing of pork and its products inactivates trichinae.

7.3.4 Toxoplasmosis

Definition

Toxoplasmosis is a systemic protozoal disease that can be either acute or chronic type with intracellular parasite.

Toxoplasma gondii in which the parasite is responsible for the development of clinically evident disease, including lymphadenopathy, myocarditis and encephalitis.

Infectious agent

Toxoplasma gondii

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Toxoplasma has two forms

1. Tachyzoites- occur in the early acute stage of infection.
2. Bradyzoites-occur in the chronic stage of infection, develop slowly and multiply in the tissue to form a true cyst.

Mood of Transmission

1. Ingestion of cysts in raw or under-cooked meat
2. Ingestion of oocysts in food, drink or from hands contaminated with feces of an infected cat.
3. Transplacental/congenital
4. Blood transfusion
5. Organ transplantation

Incubation period- from 10-23 days. One common source outbreak from ingestion of under-cooked meat is possible.

Period of communicability- Not directly transmitted from person to person, except in utero. Oocysts shed by cats sporulate and become infective 1-5 days later and may remain infective in water or moist soil for about a year.

Cysts in the flesh of an infected animal remain infective as long as the meat is edible and uncooked.

Susceptibility and resistance- Susceptibility to infection is general, but immunity is readily acquired and most infections are asymptomatic. Duration and degree of immunity are unknown, but are assumed to be long-lasting or permanent. Antibodies persist for a year, and probably for life. Patient undergoing cytotoxic or immuno-suppressive therapy or patients with AIDS are at risk of developing the disease.

Clinical manifestation

General symptoms: Although severe symptoms may be noted, Toxoplasmosis gondii symptoms are mild and mimic those seen in cases of infectious mononucleosis. The acute form of this disease is characterized by fatigue, lymphodenitis, chills, fever, headache and myalgia. In addition to chronic disease, the patient may develop maculopapular rash, encephalomyelitis and hepatitis; retinochoriditis with

Diagnosis

- Clinical sign and symptom
- Serological test
- Demonstration of the agent in body fluid or tissue biopsy
- cell culture

Treatment

1. Treatment is not routinely indicated for a healthy immuno-competent host, except in an initial infection during pregnancy or the presence of active choreoretinitis and myocarditis or other organ involvement.
2. The preferred treatment for those with severe symptomatic disease is: Pyrimethamine combined with sufadiazine and folinic acid for four weeks.
3. For pregnant women, Spirmycin is commonly used to prevent placental infection. If ultrasound or other studies indicate that fetal infection has occurred, Pyrimethamine and sulfadiazine should be considered.

Treatment for infants

1. Pyrimethamine
2. Sufadiazine
3. Folinic acid

Prevention and control

1) The cause of primary infection with Toxoplasma can be reduced by avoiding eating under-cooked or raw meat and avoiding cyst-contaminated materials (i.e. cat's litter box).
2) Meat should be heated to 60^0c or frozen to kill cysts.
3) Hands should be washed thoroughly after work in the garden and all fruits and vegetables should be washed.
4) Discourage cats from hunting.
5) Dispose cats' feces daily.
6) Control stray cats and prevent them from gaining access to sand boxes and sand piles.
7) Educate pregnant women.
   - Á To avoid cleaning litter pans or contact with cats.
   - Á Dietary meat; to heat to 60^oc or freeze it.
   - Á To wear gloves during gardening.

7.4 Animal Bite Diseases

7.4.1 Rabies

Definition

It is almost invariably fatal: acute vial encephalomyelitis (attacking brain and meninges).

Infectious agent

Rabies virus

Epidemiology

Occurrence- Worldwide in wildlife particularly in developing countries. It is primarily a disease of animals (zoonotic). It is primarily an infection of carnivores transmitted through bite.

Reservoir- Dog is common in urban areas; in the wild, wild carnivores and bats are reservoirs.

Mode of transmission- Transmitted with saliva of rabid animal introduced by a bite or scratch. Transmission from man to man is dead-ended.

Incubation period- Usually 3-8 weeks

Period of communicability -Usually 3-7 days before the onset of the disease and throughout the course of the disease.

Susceptibility and resistance- All mammals are susceptible to varying degrees. Humans are more resistant to infection than several animal species.

Clinical Manifestation

The clinical manifestation, which is the same in all species including humans, has 3 phases:

- Prodromal phase
- Excitatory phase
- Paralytic phase

Prodromal phase: Onset is heralded by a sense of apprehension, headache, fever and nausea, abnormal sensations at the site of inoculation (bite) is most significant,

Diagnosis

- History of bite by known rabid animal and the bitten person show typical symptoms leading to clinical

7.5 Direct Contact Diseases

7.5.1 Anthrax

Definition

An acute bacterial disease usually affecting the skin, but which may very rarely involve the oropharynx, lower respiratory tract, mediastinum or intestinal tract.

Infectious agent

Bacillus anthracis, spore forming bacteria.

Epidemiology:

Occurrence- Worldwide. Primarily a disease of herbivores. Humans and carnivores are incidental hosts. Primarily an occupational hazard of workers who process hides, hair (especially from goats), bone and bone products and wool: and of veterinarians and agriculture and wildlife workers who handle infected animals. Human anthrax is common (endemic) in those agricultural regions of the world where anthrax in animals is common, including countries in South and Central America, southern and eastern Europe, Asia and Africa.

Reservoir- Animals, normally herbivores, both livestock and wildlife, shed the bacilli in terminal hemorrhages or spilt blood

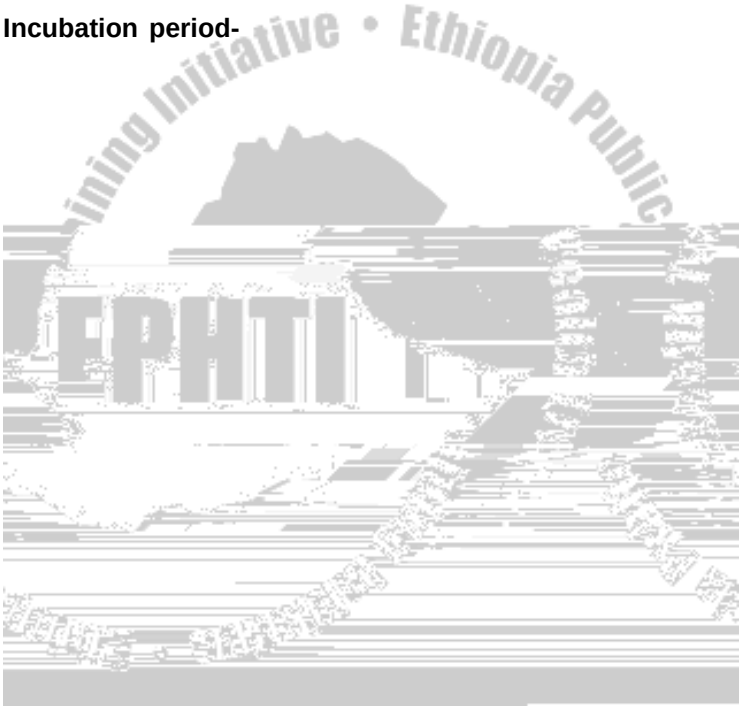
at death. On exposure to air, the vegetative forms sporulate, and the spores of B. anthracis, which are very resistant to adverse environmental conditions and disinfections, may remain viable in contaminated soil for many years after the source animal infection has terminated. Dried or processed skins and hides of infected animals may harbor the spores for years and are the fomites by which the disease is spread worldwide.

Mode of transmission-

- Cutaneous anthrax**:** Contact with tissues of animals (Cattle, sheep, goats, horses, pigs and others) dying of the disease. Bite of flies that had partially fed on such animals, contaminated hair, wool, hides, or products made from them such as drums or brushes or contact with soil associated with infected animals.
- Inhalation anthrax**:** inhalation of spores in risky industrial processes such as tanning of hides, or wool or bone processing, where aerosols of B. antracis spores may be produced.
- Intestinal and oropharyngeal anthrax**:** ingestion of contaminated meat; but there is no evidence that milk

- contaminated soil and feed, and among omnivorous bone meal or other feeds and among wildlife from feeding on anthrax carcasses.
- Vultures have been reported to spread the organism from one area to another.

Incubation period-



- The early lesion may be pruritic but painless.
- Small satellite vesicle may surround the original lesion and painful non-specific regional lymphadenitis is

Oropharyngeal anthrax

- Fever, sore throat, dysphagia, painful regional lymphadenopathy toxemia, respiratory distress may be evident.
- The primary lesion is most often on the tonsils.

Diagnosis

- Clinical data
- Gram stain of wound discharge
- Culture from the wound discharge or blood

Treatment

For Cutaneous anthrax

2. Vaccination of susceptible groups and domestic herbivores.
3. Carcasses of animals should be buried intact.
4. Butchering of infected animals should be avoided.
5. Education in mode of transmission and in care of skin abrasions for employees handling potentially contaminated articles.
6. Dust control and proper ventilation in hazardous industries.
7. Treat all animals exposed to anthrax with Tetracycline or penicillin.

7.6 Animal Reservoir Diseases

7.6.1 Leishmaniasis

Definition

A polymorphic protozoan disease of the skin and mucous membrane or a chronic systemic disease caused by a number of species of the genus leishmania.

Infectious agents

For cutaneous and mucosal Leishmaniasis

- Leishmania tropica Leishmania donovani *
- Leishmania major and Leishmania infantum *
- Leishmania aethiopica*

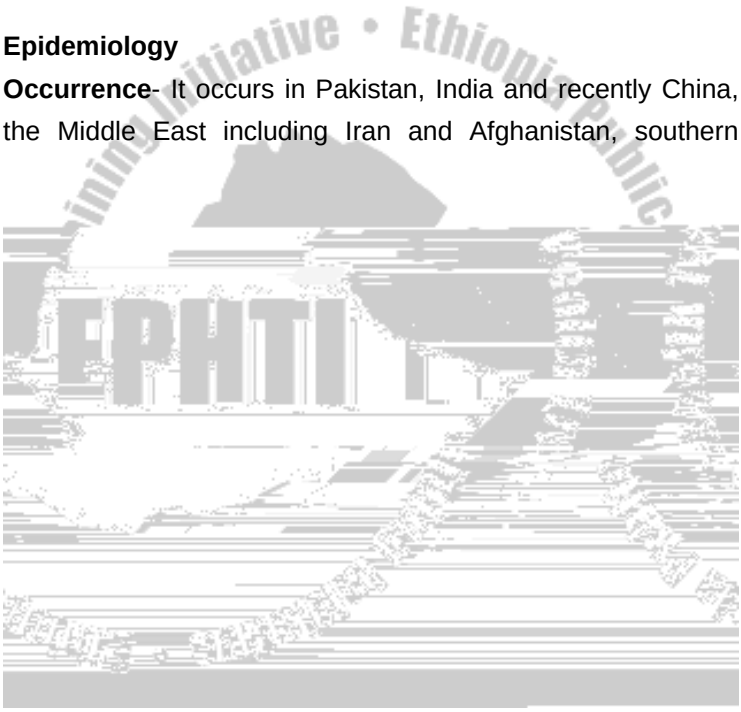
For visceral Leishmaniasis

- Leishmania donovani. *
- Leishmania infantum. *
- Leishmania tropica. * and
- Leishmania chagasi. *

*Common agents in Ethiopia.

Epidemiology

Occurrence- It occurs in Pakistan, India and recently China, the Middle East including Iran and Afghanistan, southern



Period of communicability- Infectious to sand flies as long as parasites remain in lesion, in untreated cases, usually a few months to 2 years. Eventual spontaneous healing occurs in most cases.

Susceptibility and resistance- Susceptibility is probably general. Life-long immunity may be present after lesion due to L. tropica or L. major but may not protect against other leishmanial species.

Life cycle

Fig. 7.2 Transmission and life cycle of Leishmania parasites VL: Visceral leishmaniasis, CL: Cutaneous leishmaniasis MCL: Mucocutaneous leishmaniasis. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

- There are papules that further develop to ulcers. The disease is characterized by fever, hepathosplenomegally, lymphadenopathy, anemia, leucopoenia, thrombocy-topenea, and progressive emaciation and weakness.

Diagnosis

- Demonstration of the parasite (blood or tissue)
- By culture of the motile promastigote
- Using serologic test

Treatment

Pentalvalent antimonial agents

- Pentamidine or
- Amphotercin or
- Aminoglycoside aminosidine or
- Cytokine immunotherapy

Prevention and control

1. The avoidance of outdoor activities.
2. The use of mechanical barriers such as screens and bed nets.
3. Wearing of protective clothing.
4. Application of insect repellent.
5. Treatment of cases.
6. Vector control and elimination of reservoir host (e.g. domestic dogs).

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working in areas where infected vectors are present. T. ganebie has no animal reservoir. However, T. rhodesiense causes the more severe trypanosomiasis without sleeping sickness. In Ethiopia, the distribution of Trypanosomiasis is mostly found in Jinca, Afar, Setitu Humera, Konso, Moyale, Woito, and Dilla.

Reservoir- for T. brucie gambiense it is only humans. For T. brucie rhodesiense the reservoir is dog, cattle, fox, wolf and human beings.

Mode of transmission- by the bite of infective Glossina Tsetse fly during blood meal. Congenital transmission can occur in humans. Direct mechanical transmission is possible by blood on the proboscis of Glossina and other man-biting insects, such as houseflies or in laboratory accidents

Incubation period- T. brucei rhodensiense: 3 days to few S e t b c - b

Life cycle

TRANSMISSION
1. Trypomastigotes injected through skin when tsetse fly

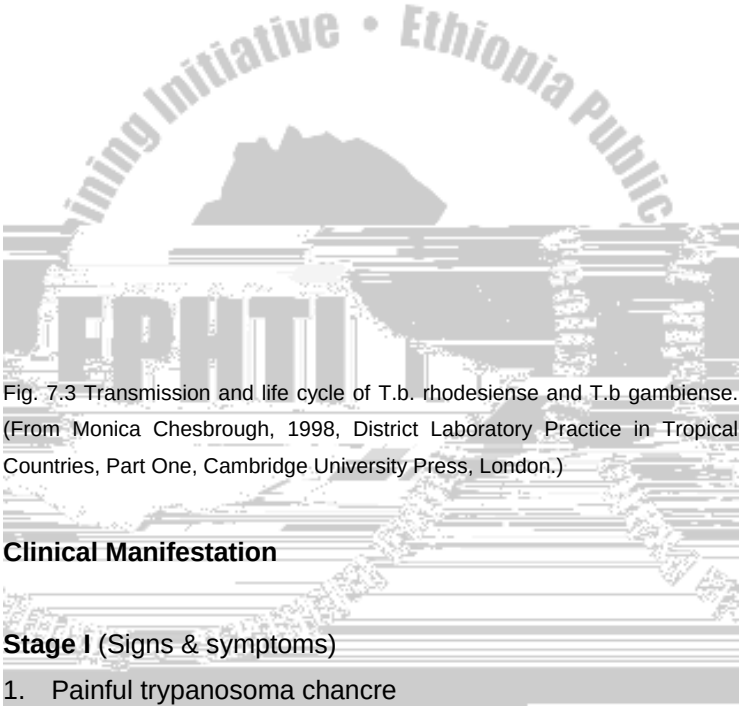

Fig. 7.3 Transmission and life cycle of T.b. rhodesiense and T.b gambiense. (From Monica Chesbrough, 1998, District Laboratory Practice in Tropical Countries, Part One, Cambridge University Press, London.)

Clinical Manifestation

Stage I (Signs & symptoms)

1. Painful trypanosoma chancre
2. Hematogenous and lymphatic dissemination
3. High body temperature
4. Lymphadenopathy discrete
5. Winter bottom's sign (classic), painless enlargement of lymph node

6. Malaise
7. Headache
8. Weight loss
9. Edema
10. Hepatomegally and
11. Tachycardia

Stage II

1. Abnormality in CSF
2. Day time somnolence
3. Tremors
4. Parkinson's disease may appear
5. Hypertonia
6. Congestive heart failure
7. CNS disease develops
8. Coma and death

Diagnosis

- Wet blood smear
- Thick blood smear
- Serological test
- CSF analysis
- Blood film
- Bone marrow biopsy

Treatment

1. Pentamidine or
2. Etlornithine or
3. Helarsupron or
4. Trypansamide

These are drugs to be used for treatment of different stages.

For stage I (Normal CSF) – T.b. gambie treated with

- Suramin or
- Eflornithine or
- Pentamidine

For stage II

Trypansamide

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Review Questions

1. List the common zoonotic diseases and their main mode of transmission.
2. Which of the Taenia species are most common in Ethiopia?
   a. Taenia solium
   b. Taenia saginata
   c. Trypanosomiasis
   d. Echinococcus granulosis
3. What are the preventive and control methods for zoonotic diseases?

CHAPTER EIGHT

FOOD-BORNE DISEASES (FOOD POISONING, FOOD-BORNE INTOXICATIONS, FOOD-BORNE INFECTION)

8.1 Learning Objectives

At the end of this chapter, the student will be able to:

- List the common food-borne diseases.
- Identify the difference between food poisoning and food infection.
- Describe the clinical manifestations and possible sources of infection.
- Participate in the diagnosis and management of food-borne diseases.
- Implement the preventive and control methods.

8.2 Introduction

Food-borne diseases, including food-borne intoxications and

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between eating a common food item and the onset of symptoms.

- Culture –staphylococcal recovery (≥10^5organisms per

8.4 Botulism

Definition

A paralytic disease that begins with cranial nerve involvement and progresses caudally to involve the extremities.

Incubation period- Neurological symptoms of food-borne botulism usually appear within 12-36 hours, sometimes several days, after eating contaminated food.

Period of communicability- not communicable

Susceptibility and resistance- Susceptibility is general.

Clinical Manifestations

- Illness varies from a mild condition to very severe disease that can result in death within 24 hours.
- Symmetric descending paralysis is characteristic and can lead to respiratory failure and death.
- Cranial nerve involvement marks the onset of symptoms; usually produces diplopia, dysphagia. Weakness progresses, often rapidly, from the head to involve the neck, arms, thorax and legs; the weakness is occasionally asymmetric.
- Nausea, vomiting, abdominal pain may proceed or follow the onset of paralysis.
- Dizziness, blurred vision, dry mouth, and occasionally sore throat are common.
- No fever
- Ptosis is frequent.
- Papillary reflexes may be depressed: fixed or dilated pupils are noted in half of patients.

- The gag reflex may be suppressed; deep tendon reflexes may be normal or decreased.
- Paralytic illus, severe constipation and urinary retention are common.

Diagnosis

- Clinical- afebrile, mentally intact patients who have symmetric descending paralysis without sensory findings.
- Appropriate History.
- Demonstration of organisms or its toxin in vomitus, gastric fluid or stool is strongly suggestive of the diagnosis
- Wound culture

Treatment

1. Hospitalize the patient and monitor closely.
3. Intubation and mechanical ventilation may be needed.
4. Antitoxin administration after hypersensitivity test to horse serum.
5. Emesis and lavage if short time after ingestion of food to decrease the toxin.

Prevention and control

1. Ensure effective control of processing and preparation of commercially canned and preserved foods.
2. Education about home canning and other food preservation techniques regarding the proper time,

pressure and temperature required to destroy spores, the need for adequate refrigeration, storage, boiling with stirring home-canned vegetables for at least 10 minutes to destroy botulinal toxin.

3. Canned foods in bulging containers should not be used, eaten or tasted.

8.5 Salmonellosis

Definition

A bacterial disease commonly manifested by an acute enterocolitis.

Infectious agent

Salmonella typhimurium and Salmonella enteritidis are the two most commonly reported.

Epidemiology:

Occurrence- Worldwide

Reservoir- Domestic and wild animals including poultry, swine, cattle, rodents and pets (tortoises, dogs, cats and humans) and patients or convalescents are carriers, especially of mild and unrecognized cases.

Mode of transmission:- ingestion of organisms in food derived from infected food animals or contaminated by feces

of an infected animal or person. Raw and under-cooked eggs and egg products, raw milk and its products, contaminated water, meat and its products, poultry and its products. Consumption of raw fruits and vegetables contaminated during slicing.

Incubation period –from 6 –72 hours, usually about 12-36 hours

Period of communicability- extremely variable through the course of infection; usually several days to several weeks.

Susceptibility and resistance- Susceptibility is general and

Treatment

1. Symptomatic
2. If there is an underlying immunosuppressive disease (conditions like AIDS, lymphoma, immunosuppressive treatment), treat the underlying cause.

Prevention and control

1. Improved animal rearing and animal marketing
2. Quality testing of the known and commonly contaminated foods
3. Avoid consuming raw or partially cooked eggs
4. Wear gowns and gloves when handling stool and urine and handwashing after patient contact.

Review Questions

1. What is the basic difference between food poisoning and food infection?
2. What is the common cause of food infection?
3. How do you prevent and control food poisoning?

CHAPTER NINE

NURSING RESPONSIBILITIES IN THE MANAGEMENT OF COMMUNICABLE DISEASES

9.1 Learning Objectives

At the end of this chapter, the student will be able to:

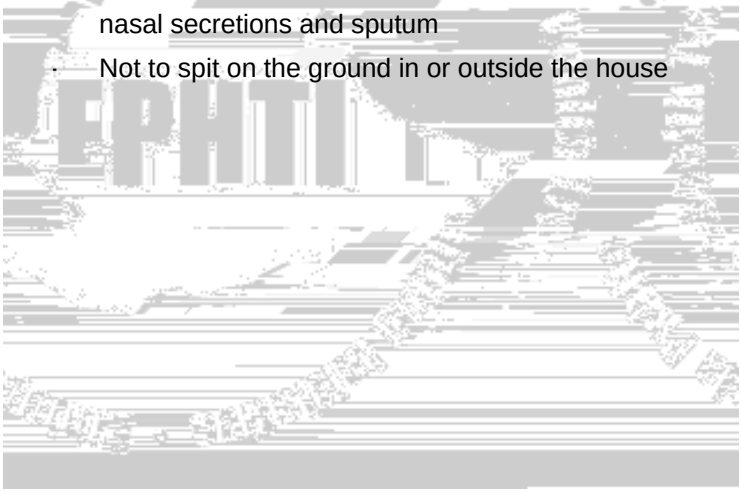
- List the different prevention and control methods for common diseases in Ethiopia.
- Implement the preventive and

For Oral-fecal transmitted diseases:

- Control of diarrheal diseases including dysentery is only possible when the problem of stool disposal is solved (deep pit latrines in rural areas).
- Providing handwashing facilities at toilets: wash hands after going to toilet, wash hands before cooking or eating.
- Fly control by proper refuse disposal and proper disposal of feces.
  - Screen toilets, cover latrines
  - Screen kitchens and food stores
  - Store left-over food where flies cannot reach it
  - Spray with residual insecticides
- Food should always be properly cooked.
- Raw vegetables and fresh fruits without intact skins should be avoided.
- Milk should be boiled or pasteurized.
- Protection, purification and chlorination of public water.
- Health education based on dangers of bottle–feeding; encourage cup/spoon feeding methods and encourage prolonged breastfeeding.
- Demonstrate prevention of dehydration by homemade soup or salt solution.
- Appropriate treatment of cases

For air-borne diseases

- Ventilation removes used air and replaces it with clean air.
- Having too many people in the same room should be avoided. This is especially important in prisons, dormitories, boarding schools, and in urban housing where many people may be forced to live in a single room.
- Health education about personal hygiene
  - To cover the mouth when coughing and sneezing
  - To use a hand kerchief or tissue paper for disposal of nasal secretions and sputum
  - Not to spit on the ground in or outside the house



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- The dangers of antibiotic chemoprophylaxis

Suggest periodical check ups for STDs for bar ladies and other women at risk.

For Zoonotic diseases

- Appropriate treatment of cases
- Educate the public to:
  - Prevent fecal contamination of soil, water, human and animal foods
  - Cook beef and pork
  - Use latrines
  - Avoid drinking untreated milk or eating products made from untreated milk
  - Eliminate infected animals
  - Use barrier precaution (gloves and clothing in the handling of carcasses and products of potentially infected animals)
  - Keep dogs and cats at home and immunize them
  - Destroy stray animals where rabies is endemic
  - Bury carcasses of animals intact
  - Vector control and elimination of reservoir host
- Education of workers to control dust by ventilating rooms

For food-borne diseases

- Appropriate treatment of cases
- Educate food handlers in strict food hygiene, sanitation and cleanliness of kitchens, proper temperature control, handwashing, cleaning of finger nails, need to cover wounds on the skin, etc.
- Temporary exclusion of people with boils, abscesses and other purulent lesions of hands, face or nose for food handling
- Education about home canning and other food preservation techniques.
- Educate public to avoid eating canned foods in bulging or damaged containers
- Avoid consuming raw eggs or partially cooked ones
- Wearing gowns and gloves when handling stool and urine and handwashing after patient contact

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GLOSSARY

Albuminuria	Urine containing protein
Anuria	Cessation of the production of urine
Biopsy	The removal and examination of tissue from somebody who is ill, in order to find out more about his/her disease.
Bloating	Full of liquid or gas and therefore abdomen is felt larger than normal in a way that is unpleasant.
Case	An infected or diseased person or animal having specific clinical, laboratory and epidemiological characteristics.
Cercariae	The stage of the fluke life cycle that develops from germ cells in a daughter sporocyst. This is the final developmental stage in the snail host, consisting of a body and a tail that aids in swimming.
Chemoprophylaxis	The administration of a chemical, including antibiotics, to prevent the development of an infection or the progression of an infection to clinical disease.
Chemotherapy	The treatment of diseases with the use of chemical substances.
Chronic diarrhea	Diarrhea which persists for more than two weeks.

Contact A person or animal that has been in such association with an infected person or animal, or a contaminated environment as

	or passes its sexual stage are primary or definitive hosts; those in which the parasite is in a larval or asexual stage are secondary or intermediate hosts.
Hydrocele	Accumulation of serous fluid in the scrotum
Immune individual	A person or an animal that has specific protective antibodies and/or cellular immunity as a result of previous infection or immunization, or is so conditioned by such previous specific experience as to respond in such a way that prevents the development of infection and/or clinical illness following re-exposure to the specific infectious agent.
Immunity	That resistance usually associated with the presence of antibodies or cells having a specific action on the microorganism concerned with a particular infectious disease or its toxin.
Unapparent infection	The presence of infection in a host without recognizable clinical signs or symptoms.

	asymptomatic, subclinical, occult infection).
Incidence	The number of instances of illness commencing or, of persons falling ill during a given period in a specified population. More generally the number of new events (e.g. New cases of a disease in a defined population within a specified period.)
Infected individual	A person or animal that harbors an infectious agent and who has either manifest disease (patient or sick personal) or unapparent infection (see carrier).
Intermediate host	A host for only the larval or sexually immature stages of parasite development.
Jaundice	A syndrome characterized by an increased level of bile pigments in the blood and tissue fluid.
Lymphadenopathy	Enlargement of lymph glands in more than one centimeter for a variety of disease conditions.
Lymphadenitis	Inflammation of the lymphatic vessels.
Melaena	Feces containing blood.
Merozoite	One of the trophozoite released from human red blood cells or liver cells at maturation of the asexual cycle of malaria.

Microfilaria A term used for the embryo of a filaria, usually in the blood or tissues of humans ingested by the arthropod intermediate host.

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