LECTURE NOTES

Disease Prevention and Control

For Health Extension Workers

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In collaboration with the Ethiopia Public Health Training Initiative, The Carter Center, the Ethiopia Ministry of Health, and the Ethiopia Ministry of Education

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This material is intended for educational use only by practicing health care workers or students and faculty in a health care field.

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Table of Contents

Contents **Page**

Acknowledgement i

Table of Contents ii

Acronyms iii

Introduction 1

UNIT ONE- Introduction Prevention and Control of TB and Leprosy 2

UNIT TWO- Prevention and control of HIV/AIDS and other Sexually Transmitted Infections 29

UNIT THREE- Prevention and Control of Malaria 45

Glossary 63

References 65

Acronyms

AIDS- Acquired Immuno-Deficiency Syndrome

CNS- Central Nervous System

DOTS- Directly Observed Therapy Strategy

HBC- Home Based Care

HEW – Health Extension Worker

HIV - Human ImmunoVirus

ITNs- Insecticide Treated Nets

IV- Intravenous

MB- Multi Bacillary

MDT- Multi Drug Therapy

mg- Milligram

MTCT- Maternal To Child Transmission

PB- Paucibacillary

PLWHA- People Living With HIV/AIDS

PO- Per Os(oral)

RFT- Release From Treatment

STDs- Sexually Transmitted Diseases

TB - Tuberculosis

VMT- Voluntary motor test

VST- Voluntary sensory test

WBCs- White Blood Cells

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Introduction

This lecture note has been prepared for health extension worker trainee who has completed tenth level. The objective of this lecture note is to provide the skill, knowledge and attitude to trainees in preventing and controlling major diseases which accounts for about 60-80%of Ethiopia's morbidity.

This lecture note is expected to provide the trainee a chance to facilitate disease prevention and control to the best of her training level in the community.

This lecture note covers basic concepts of prevention and control of tuberculosis, leprosy, HIV/AIDS and other STIs, and malaria at the community level.

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UNIT ONE

Prevention and control of TB and leprosy

Objectives:

***General objective*:** At the end of this unit the trainee will be able to identify people with TB & leprosy and facilitate care for them with follow up services.

Specific objectives: at the end of this unit the trainee will be able to:

- assist people with sings and symptoms of TB in the community to get timely treatment by proper history taking.
- ensure regular follow up of TB patients on treatment by proper record keeping and health education.
- assist people with anesthetic patches in the community to get timely treatment by a proper history taking and examination of the skin.
- ensure regular follow up of leprosy patients on treatment by proper record keeping & health education.

Tuberculosis

Tuberculosis (TB) is a chronic infectious disease caused in most cases by mycobacterium tuberculosis, but rarely by mycobacterium bovis and avium.

TB affects:

- The lungs (called pulmonary TB) which account for 80% of all TB cases.
- Other organs (called extra pulmonary TB) account for 20 % all TB cases.

Sources of TB:

- Untreated pulmonary TB patients
- Milk from infected cows (source of M. bovis)

Mechanism of Transmission

- Inhalation of droplets containing bacilli expelled from pulmonary TB patients by coughing and sneezing. Person living in the same house or frequent contacts are at risk of Pulmonary TB
- Consumption of raw milk containing M. Bovis

Risk groups:

TB affects people of all ages and sexes. However, it is commonly found in people with:

Poverty and Crowded living conditions- Poverty is the root cause of malnutrition and crowded living condition, both of which are risk factors to TB infection. Moreover, poverty enhances the spread of HIV infection which decreases the immunity of the body and increases the chance of TB infection.

Malnutrition- malnutrition decreases the defense of the body and predisposes the person to TB infection.

HIV/AIDS- Infection with HIV destroys the immune mechanisms of the body and make the individual susceptible to the development of TB. HIV infected people have about 10 times higher risk of infection by TB.

Signs and symptoms

Pulmonary TB can be suspected in people presenting with:

- Persistent cough for 3 weeks or more
- Cough with productive of sputum, with or without blood, shortness of breath and chest pain
- Loss of weight, intermittent fever, night sweats, loss of appetite and fatigue.

Types of Extra Pulmonary TB (EPTB)

The signs and symptoms of extra pulmonary TB (EPTB) depend mainly on the organ(s) affected.

Tuberculosis Lymphadenitis

- Painless slow enlargement of lymph nodes, followed by discharging of pus at the later stage.

TB pleurisy

It is inflammation of the pleura caused by TB.

- Chest pain during breathing in
- Mild cough
- Breathlessness

TB of bones and / or joints

- Localized pain and or swelling of bones, joints with tenderness
- Stiffness of joints
- Spontaneous fracture or deformity
- Muscle weakness

Intestinal TB

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

TB meningitis:

- Headache

- Fever
- Vomiting
- Neck stiffness
- Mental confusion

Patients with signs and symptoms suggestive of both Pulmonary TB & Extra-Pulmonary TB should be referred to hospitals.

Diagnosis

- signs and symptoms suggestive of TB
- Examination of sputum by direct microscopy out of 3 sputum examined if two are positive for Acid Fast Bacilli (AFB) or one positive sputum plus x-ray finding suggestive of Pulmonary TB is defined as smear positive TB.
- Sampling and microscopic examination of tissues in Extra-Pulmonary TB., etc.
- Chest x-ray
- Culture of sputum

Management and Treatment

DOTS (Directly Observed Therapy Strategy)

DOTS is an effective & safe treatment of TB. It has two phases.

- I**ntensive phase (the 1st 8 weeks**)- Drugs are collected and swallowed daily under the supervision of health workers.
- C**ontinuation phase (the next 6 months)** –Drugs are collected monthly and swallowed daily at home.

TB treatment Categories

The number of drug combinations given to a patient differs depending on treatment categories. There are 4 treatment categories of TB grouped based on:

. Sputum smear positivity

. Seriousness of the disease

. Previous treatment history & types of drug combination given

. Default from DOTS

. Children

. Pregnant women

Category-I: is given for smear positive Pulmonary TB & seriously ill smear negative Pulmonary TB and Extra-Pulmonary TB cases. The drugs for this category are

- 2 months Streptomycin (S), Rifampicin(R),Isoniazid(H) & Pyrazinamid(Z) followed by 6 months Ethambutol(E) & Isoniazid OR
- 2 months Ethambutol, Rifampicin, Isoniazid & Pyrazinamide followed by Ethambutol & Isoniazid for 6 months.

Category- II (re treatment): 2months SERHZ followed by 1 month ERHZ & 5 months E3 (RH)3, 3 indicates that treatment is given 3 times a week. This treatment is given for:

- Previously treated patients with relapse, default (smear positive)

- Patients still smear positive at month 5 and or month 8 of treatment with short course chemotherapy (SCC) or long course chemotherapy (LCC) respectively.

Category- III: short course chemotherapy for mild smear negative Pulmonary TB, Extra-Pulmonary TB & mild TB in children.

Drugs- 2 months RHZ followed by 6 months EH.

Category- IV: Chronic cases that continue to be smear positive after completion of a supervised re treatment (initial and continuation phases).

- These are considered incurable with the drugs currently available in Ethiopia
- There is a persistent risk of transmission to the community
- Give life long isoniazid to decrease transmission to others

Domiciliary treatment

Mostly patients are treated on ambulatory basis, staying at their home and visiting the treatment unit daily during the intensive phase monthly, during the continuation phase of treatment . However, hospitalization or admission is required if the patient:

- is seriously ill.
- is unable to attend the health facility on daily basis due to distance.
- Has developed side effects of drugs.

The need for regular treatment and defaulter tracing

Regular treatment is essential because it:

- Ensures complete care
- Decreases disease transmission to others and spread in the community
- Minimizes complication of the disease
- Prevents the emergence of drug resistance
- Prevents treatment failures & relapses

Defaulter is a patient who has been on treatment for at least 4 weeks and discontinued his /her treatment for more than 8 consecutive weeks.

Causes for Defaulting

- Lack of knowledge & understanding about the disease & duration of treatment
- The wrong assumption that the disease is cured
- Distance from the health facility
- Fear of side effects of the drugs
- Appearance of side effects
- Appearance of patient to somewhere without having transfer letter to other health facilities.

Defaulter retrieval

If a patient fails to attend for 2 days during the intensive phase & for 2 weeks during the continuation phase, he/she should be traced.

Tracing can be done by:

- Providing information to the community leader to contact the patient.
- A home visit by the HEW.
- Enhance peer group discussion in defaulter tracing
- Enforcement of community legislation to trace defaulters.

Prevention

- **Prophylaxis:** Isoniazid is given for children below the age of 6 years having a family member with smear positive PTB.
- **Vaccination:** BCG (Bacillus calmette Gurrein) is a vaccine made from live attenuated strain of bovine tubercle bacilli and mostly given at birth and for children with tuberclin test induration less than 6mm diameter if BCG is not given previously.

It protects children from severe forms of TB and leprosy. It is not given for children with AIDS.

Health Education

- Cover mouth with handkerchief or a piece of clean cloth during coughing & sneezing
- Collect sputum in a cupped container & bury the sputum, and advice not to spit everywhere.

- Allow adequate ventilation of living rooms
- Drink boiled milk

Practical approach

- Counseling of TB patients & their households

- Counsel TB patients & their family
- discuss the main points for counseling
- Steps of counseling & frequency of counseling

- Training & counseling of defaulters: - Practice how to trace defaulters and advice them to continue treatment. The patient should be asked why treatment was discontinued, and clearly counseled about the necessity of regular treatment, & dangers of discontinuation. During counseling the family members should be involved.

- Observation visits to health centers where TB cases are diagnosed and treated:

-TB is diagnosed by the presence of:

- Signs and symptoms suggestive of TB
- Examination of sputum by direct microscopy out of 3 sputum examined if two are positive for Acid Fast Bacilli (AFB) or one positive sputum plus x-ray finding suggestive of Pulmonary TB is defined as smear positive TB.

- Sampling and microscopic examination of tissues in Extra-Pulmonary TB, etc.
- Chest x-ray
- Culture of sputum

- Observe how TB cases are treated & followed
- Record of TB patients that you should observe and know their use
  - Sputum/skin smear examination request form
  - Laboratory registers –kept in the laboratory unit
  - Unit TB registers
  - Referral & transfer form
  - Woreda TB register
  - TB treatment card
  - Quarterly report on case finding, and the results of treatment
  - Quarterly drug order form
  - Quarterly laboratory supplies order form
  - Quarterly TB & leprosy activity report form
  - Care after RFT register

- Health education materials that you need to prepare /collect:

- Diagrams showing the routes of transmission, the ways of prevention, the treatment, etc

- Flip charts / Blackboards for listing the symptoms and signs of the disease, the phases of treatment and drugs, & how diagnosis is made
- Video showing how the two phases of treatment can be implemented

- Organizing awareness session in the community:

Active community participation is essential for TB prevention and control to do this the community should receive the appropriate information. The health education should include the following points:-

- TB is an infectious disease caused by bacilli, not by a curse or witch craft
- Close contacts can be infected by TB, and they should be checked for symptoms & signs of TB
- The bacilli are killed by DOTS if taken regularly with the recommended doses, and cures the disease
- During DOTS, patients are no longer infectious & therefore not a danger to the family or community
  - Tablets are taken once a day
  - Keep drugs out of the reach of children
  - Never give your drugs to anyone else
  - Methods of prevention
  - The dangers of untreated or partially treated TB

Leprosy

Leprosy is a chronic infectious disease of people caused by mycobacterium leprae. Essentially, it is the decrease of the peripheral nerves & the skin. However, other organs & tissues (the eyes, the mucosa of the upper respiratory tract, muscle, bone & testes) can also be involved.

Transmission

Mycobacterium leprae is an acid fast bacillus, largely found on the colder parts of the body (nose, ear, skin) and discharged mostly with the nasal discharge and from wounds of the skin of multibacillary patients. Transmission of the disease from MB to healthy individuals occurs through inhalation of droplets containing the bacteria into the lungs and by prolonged years close contact with leprosy patients.

Incubation Period : 9 months to 20 years.

Period of communicability: infectiousness in lost in most instances with is 3 months of continuous and regular treatment with dapsone or clofazamine or with in 3 days of rifampicin treatment.

Types of leprosy

1. **Multibacillary leprosy (MB)**
   - Patients with six or more skin lesions
   - Patients with less than six skin lesions but having positive skin smear result

2. **Paucibacillary leprosy (PB)** – patients with 1-5 leprosy skin lesions

Signs and Symptoms:

Signs and symptoms vary between two polar forms, lepromatous and tuerculoid leprosy.

Lepromatous (multibaccilary) 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, eye involvement leads to iritis and keratitis.

Tuberculin (paucibacillary) form

- Single or few skin lesions. The lesions are sharply demarcated, anesthetic or hyperesthetic and bilaterally symmetrical
- Severe peripheral nerve involvement.

Borderline

- Has features of both polar forms and is more liable, with a tendency to shift toward the lepromatous form in untreated patient and toward the tuberculosis form in treated patient.

Diagnosis

- Detection of anesthetic paler skin patch with wisp of cotton
- Detection of enlarged nerves by palpation with hands
- Detection of acid fast bacilli from smear taken from the skin and examined with microscope.

Treatment

Leprosy can be cured with drugs which are given for a long period of time. Regular treatment of leprosy is essential to:

- Enhance healing and prevent complications
- Decrease the chance of drug resistance
- Decreases transmission of the disease

Multi drug therapy (MDT)

MDT is a new treatment program for leprosy patients using multiple drugs in combination. The drug combinations & duration of treatment differ depending on the type of leprosy shown below.

Type of leprosy	Drug (s) taken daily at home	Drug (s) taken once a month under supervision	Duration
Paucibacillary (PB)	Dapsone 100 mg	Rifampiein 600 mg	6 months
Multibacillary (MB)	Dapsone 100mg clofazimine 50mg (or 100mg every other day	Rifampicin 600 mg Clofazimine 300 mg	2 years

N.B. The doses given above are for adults. However, the dose of the drugs for children can be calculated based on age & body weight of the patient.

Benefits of MDT:-

- It shortens treatment duration and cures the disease, thereby:
    - Increase compliance
    - Prevents deformity more efficiently and decreases the chances of transmission by quickly rendering the patient non infectious
    - Decreases the annual prevalence of the disease
    - Minimizes stigma and discrimination and enhance reintegration to the community.
- Prevents emergence of drug resistance
- Treats dapsone resistant infection
- No need for sensitivity fest

Domiciliary treatments

Most patients with leprosy are managed in out patient clinics with skilled staffs.

Advantages:

- Decreases stigma and discrimination, thereby minimizing the related psychosocial problems.
- Enhance family support to patient care
- Creates a conducive environment for the education of the family

Disadvantages:

- Reactions may be precipitated by the treatment and cause anesthesia & paralysis
- Needs increased number of skilled staff for smooth running of such programs

However, out patient treatment is still highly preferred. Drugs are collected on fixed clinic day. Patients who can't attend on these fixed clinic day should be given an opportunity to collect drugs on any of the subsequent days or drugs should be given through family member or sent to the patient's house.

Hospital Care

Short stay in hospital may benefit some patients

- To establish the routine or regular treatment

- To early diagnose reactional states & early disability and correct
- For educating patients about the disease & its treatment

Admission to hospitals is essential in:

- Sever reactions
- Deep ulcers
- Red and/or painful eye
- Pregnancy
- TB or other sever infections
- Children younger than 12 years
- Recent history of peptic ulcer
- History of diabetes
- General illness with fever
- Patients who didn't improve during previous course of treatment
- A patient who develops reaction for the 3rd time.

Precautions related to drug treatment - advice patients and family

- Regular daily drug intake and completion of course of treatment
- Keep drugs out of the reach of children
- Don't give drugs to others

Precautions for the prevention of further physical disability & deformity

- Much of the damage that occurred before starting MDT may not be reversible. Thus, focus on educating patients to prevent further disabities by self-care is very important.

Prognosis

The skin patches never disappear quickly, though after a year or so in most cases.

They will become more normal in color. Very often, a skin patch remains visible even after the disease is cured and drugs stopped.

Deformity and impaired sensation often improve but may not recover completely even when the disease is fully cured.

Some patients may develop reactions, which need to be treated at a hospital.

Prevention of Complications

A**) Prevention of foot ulcer**

- Not to walk on barefoot
- Not to use tight shoes
- To wear foot protective
- Daily inspection of feet for trauma and give care to the smallest injury
- When foot ulcers appear:
  - . Soak with Soap & water for at least 20 minutes daily
  - . Rest the foot, don't walk on it
  - . Wear the right size of shoes

B**) Prevention of ulcers of anesthetic hands**

- Avoid handling of hot or sharp object or
- Handle hot or sharp objects using clothes or non plastic gloves

C) **Prevention of contractures & muscle atrophy**

- Finger & thumb exercises
- Physiotherapy

D) **Protection of the eyes**

- For early eyelid weakness advise daily exercise i.e. close eyelid 20 times three times a day
- Inspect your eyes everyday
- Use mirror to see for the presence of foreign bodies and remove it
- At night use simple cotton eye shield to prevent dust falling into the eyes
- In bright sunlight wear an eye shield or a hat with a wide brim
- Wash eyes daily

Rehabilitation

Social rehabilitation

- Education of the public, families and patients
- Reintegration of patients to the society

Physical rehabilitation

- Restore the patient to the best possible function
- Prevention and correction of deformities

Vocational rehabilitation

- Selection of patients for appropriate jobs and training & placing to selected jobs.

Psychological rehabilitation

- Report reactions immediately to the nearby hospitals facilities
- Trace defaulters to continue regular treatment

Defaulter tracing

- Asking fellow patients why the patient has failed to collect drugs and ask to contact and counsel the patient.
- Notify the contact person (in the register) to encourage the patient to return to treatment
- Delivery of messages by Health extension worker during home
- Write an official letter to the Kebele or peasant association to assist in retrieving the patient

Prevention of transmission

- Transmission of the disease requires years of close contact with leprosy patients. The chance of transmission of the disease from patients taking regular treatment is very minimal. E.g. regimens containing rifampicin renders the patient non-infectious within 2 days. Thus, no need for isolation of patients
- **Chemoprophylaxis:** administering drugs as a preventive means is not beneficial.

- **Vaccination:** BCG has been shown to prevent both severe form of TB & leprosy

Practical Approach

Counseling of patients and their households

The success of treatment largely depends on clear understanding of the disease by the patient and his/her family. Reeducation of stigma and discrimination, and supporting leprosy patients by the family and the community can be ensured by a proper counseling of patients and their families. Thus, students are expected to observe how patients are counseled and arrange a role-play session to practice the counseling process based on the following points:

- The routes of transmission
- The methods of prevention
- Benefits of treatment (MDT)
- The techniques of self-care
- The role of the family in physical rehabilitation
- Drug strips (calendar packs) for PB and MB patients

Tracing and Counseling of defaulters

A patient who has missed more than 3-4 weekly doses of MDT in total is a defaulter However, any leprosy patient who missed a supervised treatment and failed to come to treatment unit for two weeks after that should be traced and counseled.

The students should practice how and when to trace patients absent from treatment by:

- Asking fellow patients why the patient has failed to collect drugs and ask to contact and counsel the patent.
- Notify the contact person (in the register) to encourage the patient to return to treatment
- Delivery of messages by Health extension worker during home
- Write an official letter to the Kebele or peasant association to assist in retrieving the patient.

Observation visits to health centers where leprosy cases are diagnosed and treated

Students are expected to observe and identify:

- the diagnostic and treatment units
- The steps followed by the health center for diagnosis and treatment of cases
- How new leprosy is diagnosed and classified
- Treatment given Drug strips (calendar packs), amount, etc
- Record keeping
- Administration of drugs under supervision

Charts and materials to be prepared and organizing awareness sessions in the community.

Students are required to prepare (collect) the following materials and organize awareness sessions:

- Photographs showing leprosy skin lesion, how they can be diagnosed and treated, changes after successful completion of treatment and the complications of untreated disease.
- Drawings and /or flip charts showing
  - The routes of transmission
  - The methods of prevention
  - Benefits of treatment (MDT)
  - The techniques of self care
  - The role of the family in physical rehabilitation
  - Drug strips (calendar packs) for PB and MB patients

Record keeping of leprosy patients: Students are expected to observe the different types of registers and forms, and how and when they are used:

- Woreda leprosy register
- Unit leprosy register
- Laboratory register
- Leprosy patient record card
- Monthly or quarterly VMT/VST form
- Request for sputum skin smear examination

- Referral and transfer form
- Quarterly report case finding
- Quarterly report on the results of treatment
- Patient identity card
- Quarterly drug order form
- Laboratory supplies order form
- Quarterly TB & leprosy activity report form
- Care after release from treatment (RFT) register

Examination of the skin with a wisp of cotton wool

The sensation of the skin lesions is felted with wisp of cotton wool as follows

- roll the end of a wisp of cotton wool into a fine point
- explain the purpose of the test and what is expected from the patient
- the skin should be touched with this point, so that the cotton wool bends
- do trail test by touching the normal skin with the patient's eyes open
- the do the testing with the patient eyes closed, Tell the patient to the site touched with each touch, first test the normal skin when he/she points correctly, test in the skin patches, while touching normal skin now & then. Watch at every touch that the patient keeps his eyes closed

- Observation visit to health centers where leprosy cases are diagnosed

Health Education

- Improves the chances of early diagnosis
- Improves compliance of patients in drug taking and self care
- Prepare different charts, photographs showing the types of skin lesions and complications (such as claw hand, foot ulcers, painless wounds, foot drop and weakness of the eyelids, etc) and how they can be prevented.
- Remember the six “D” s of health education – tell about

Duration: -

Duration of treatment differs depending on the types of leprosy i.e. paucibacillary (PB) leprosy for 6 months and multibacillary (MB) leprosy for 2 years.

Drugs

Treatment works very slowly and may not, in its own, cure anesthesia, claw hand or ulcers

The type and number of drugs differ depending on the type of leprosy -2 drugs dapsone & rifampicin) in 3 drugs (rifadapson clofazimine) in MB leprosy

Disappearing skin patches:

The skin patches never disappear quickly, though after a year or so in post cases, they will become more normal in color. Very often a skin patch remains visible even after the disease is cured and drugs stopped.

Disability:

Deformity and impaired sensation often improve but mayn't recover completely even when the disease is fully cured.

Diet: no diet restrictions are necessary.

Dangers: some patients may develop reactions, which need to be treated at a hospital.

Review Questions

1. Mention mechanism of transmission of TB and leprosy
2. What are the risk groups for TB
3. List phases of DOTS
4. List the three main methods of preventing the transmission of of TB
5. Mention the methods of prevention of foot ulcer
6. List benefits of MDT

UNIT TWO

Prevention And Control Of HIV/AIDS And Other Sexually Transmitted Infections

Objectives:

***General* Objectives:** – At the end of the instruction, the trainee will be able to facilitate prevention and control of HIV/AIDS and other STIs in the community.

Specific objectives:-at the end of the instruction the trainee will be able to:

- Collect data on HIV/AIDS and other STIs using standard format
- Help those affected by HIV/AIDS and other STIs to get proper treatment by taking proper history and by identification of symptoms
- Facilitate open discussion about HIV/AIDS and other STIS at the household level by motivating the family
- Help family members to take care of PLWHA at home efficiently and effectively

HIV/AIDS

HIV is the virus that causes AIDS. HIV destroys a certain type of blood cells known as T-cells or CD4 cells that help the body fight off infection, and gradually weakens the immune system and exposes to other communicable diseases or cancer. It is a virus that attacks only human beings.

HIV has two main species. They are known as HIV-1 and HIV-2. HIV has many sub-species. The virus that is wide spread in Ethiopia is the HIV-1C sub-species.

AIDS is an advanced stage of HIV infection that occurs when the immune system cannot fight off infections that the body is normally able to withstand. At this stage, the infected person becomes more susceptible to a variety of infections, known as opportunistic infections and other conditions (e.g. chronic diarrhea, toxoplasmosis, TB, pneunocystis pneumonia, etc).

A person can be infected with HIV for many years before any symptoms occur, and during this time, an infected person can unknowingly pass the infection to others.

HIV/AIDS is a fast spreading disease that does not have any cure. It does not discriminate in terms of age, sex, color, level of social status, etc. It is a disease which can stay in the body a long time(3-20 years) with out any symptom.

Transmission

Sexual contact:

- Heterosexual
- Anal sex
- Oral sex

Blood contact:

- Injections/needles (sharing needles, IV drugs, or injury from contaminated needles or other sharp objects)
- Cutting tools (using contaminated skin-piercing instruments, such as scalpels, needles, razor blades, circumcision instruments)
- Transfusions (receiving infected blood or blood products) or transplantation of an infected organ.
- Contact with broken skin (exposure to blood through cuts or lesions).

Mother to child transmission (MTCT):

- During pregnancy
- During delivery
- During breast feeding

HIV is not transmitted through:-

- Ordinary social or casual contact
- Shared clothing
- Touching
- Shared food or dishes

- Dry kissing
- Shaking hands
- Toilet seats
- Insect bites
- Massaging another person
- Living with a person with HIV

Risk behaviors related to HIV/AIDS:

- Promiscuity
- Extra marital sexual practices
- Harmful traditional practices
- Alcoholism and drug use (e.g. chat chewing, hashish)

Signs and Symptoms

Major Signs and symptoms:

- Weight loss (>10% of body weight)
- Prolonged fever (>one month)
- Chronic diarrhea for one month

Minor signs and Symptoms:

- **Swelling of the lymph nodes**
- Persistent cough greater than one month
- Skin diseases (rashes, generalized pruritic dermatitis)
- Pulmonary and/or disseminated TB.
- Recurrent Hepes zoster
- Pneumonia
- Chronic herpes simplex

- CNS derangement
- Night sweats and general body weakness
- Kaposis sarcoma
- Silky hair

➢ ***N.B.*** No one dies from AIDS or HIV; rather, a person with AIDS dies from an infection or condition that his or her weakened immune system can no longer fight off.

Management and Treatment.

Early identification and management of signs and symptoms of HIV/AIDS is very important in the prevention and control of HIV/AIDS in the community. **Actions taken at home during opportunistic infections**

Skin problems (open sores)

- Wash with soap and water
- Keep the area dry and apply 1% gentian violet solution
- Dressing can be made of cloth strips that have been washed and dried in the sun
- Dressings with pus or blood should be handled the way body fluids are handled

Sore mouth and throat :

- Rinse the mouth with warm water mixed with a pinch of salt

- For white patches, suck a lemon to ease sores on the lips and mouth
- Eat soft foods
- Apply gentian violet solution to sores of lips and mouth

Pain

- If lying in bed, change position frequently
- Massage of body parts
- For swelling , raise legs or swollen body parts on pillows

Fever

- wash the body in cool water or tepid sponging
- increase fluid intake more than usual (water, tea, juice)
- If fever is persistent and very high, refer the patient for medical treatment

Chronic diarrhea

- Increase fluid intake more than usual , use ORS preferably.
- Continue eating solid foods, porridge, fruit, etc
- Wash and dry the skin around the anus and buttocks after every bowel movement

Difficulty in breathing and cough

- Increase fluid intake
- Sitting position if necessary or change of position
- Cover mouth when coughing
- Refer the patient if the cough and breathing difficulty is associated with chest pain fever and sputum containing blood

Care and Support of people living with HIV/AIDS (PLWHA) at home

PLWHA need special attention from their family and should not be isolated within the home since isolation aggravates the problems, lower their self esteem and initiate them to revenge others.

The advantage of HBC services are:

- To help prevent contamination and cross infection
- To refresh PLWHA
- To establish state of cleanliness

Components of HBC are:

General hygienic measures:

- Bed bath should be given regularly by using mild soap and rinse well. The patient can use body lotions or creams to restore moisture to dry skin. While giving bed bath the care giver should always be gloved .
- Mouth care- maintain good dental hygiene by brushing teeth with a soft tooth brush after meals
- **Turning patient in bed-** encourage change of position to bed ridden PLWHA to prevent pressure sores caused by lying on one side of the patient for long periods. Turning should be done at least every four hours.
- Maintain food safety

- Cook food thoroughly
- Eat cooked foods immediately
- Store cooked foods carefully
- Wash hands repeatedly
- Keep all kitchen surfaces clean
- Reheat cooked foods thoroughly
- Use pure water
- Avoid contamination of foods with insects, rodents, etc
- **Careful handling of body fluids**- PLWHA are at a greater risk of contracting various infections. Body fluids are often a source of infection to both PLWHA and their families . There fore, wash hands with soap and water before and after contact with contaminated materials, contact with own body fluids (semen, mucus, blood, pus , vomitus).
- Do not share razors.
- Keep finger nails and toe nails clean, keep nails short.
- Unwashed hands should be kept away from eyes, nose and mouth.

Nutrition (serving food)

The purpose of nutrition services to PLWHA is to provide a diet that can compensate the catabolic losses due to the illness as well as for the patient to live a relatively comfortable life. Food preparation and serving should stimulate the patients appetite, encourage ingestion and usually provide small, frequent meals of favorite foods.

Symptomatic care of opportunistic infections:

The main objectives of home based care (HBC) of opportunistic infections are to reduce suffering and to promote recovery of those infections.

Home Based Care

- Identify PLWHA that need home treatment
- Identify the conditions for which PLWHA require home treatment
- If drug is prescribed make, sure that it is taken according to prescription.
- **Refer PLWHA who need medical treatment-** PLWHA often have health problems that can not be managed at home .Therefore, the home based caregiver is to be able to recognize such conditions and provide referrals for medical treatment.

Precautions for caregivers at home

- Precautions to reduce exposures to blood and other body fluids
- Care should be taken when handling needles and sharp objects
- Remove blood from surfaces and containers with soap and water
- Flush all liquid waste containing blood down the toilet, being careful to avoid splashing
- Wash clothes and linens used by the persons with HIV in the usual way
- Separate dishes or eating utensils that are not required by person with HIV, wash as normal with soap or detergent and hot water.
- Person with HIV should not prepare food when she/he has diarrhea
- Do not share razors or tooth brushes
- PLWHA should avoid close contact with people who have contagious diseases (chicken pox, common cold, flue) until the symptoms are resolved.
- Persons with skin infection (e.g. Boils, cold sores, fever blisters, shingles) should avoid contact with a person with HIV. infections

Other Sexually Transmitted Infections (STIs)

The traditional method of diagnosing STIs is by laboratory tests. However, these tests are unavailable or too expensive in the community. For this reason, syndromic approach has been suggested by the WHO (in 1998) for use in low resource countries like Ethiopia. Syndromic approach relies on signs and symptoms of STIs and risk assessment but not laboratory tests. The health extension worker should take proper history regarding STIs and refer suspected cases to the health institutions. HIV/AIDS and other STIs management should involve partner notification and individuals should be encouraged to refer their partners. Free discussion and cooperation between partners is essential to prevent the spread of STIs including HIV/AIDS.

Syphilis (Hard Chancre)

A sexually transmitted disease characterized by a primary lesion, a later secondary eruption on the skin and mucous membranes, then a long period of latency, and finally late lesion of the skin, bones, viscera, CNS and cardiovascular systems. Treponema pallidum, a spirochete is the infectious agent.

Clinical manifestations

The clinical presentation is divided in to three groups:

- **Primary syphilis –**

  Consists of hard chancre, the primary lesion of syphilis, together with regional lymphadenitis. The hard chancre is a single, painless ulcer on the genitalia or else where (lips, tongue, breasts, anus) and heals spontaneously in a few weeks with out treatment. The lymph glands are bilaterally enlarged and not painful. There will not be suppuration (pus formation).

- **Secondary syphilis**

  After 4-6 weeks of the primary infection, a generalized secondary skin eruption(including palms and soles) appears often accompanied by mild fever and sore throat. These early skin lesions are not itchy but they are highly infective.

- **Tertiary syphilis-**

  This stage is characterized by destructive, non-infectious lesions of the skin, bones, viscera and mucosal surfaces. Other disabling manifestations occur in the cardiovascular and central nervous systems.

Chancroid (soft chancre)

An acute bacterial infection localized in the genital area and characterized by single or multiple painful necrotizing ulcers at the site of infection. Haemophilus ducrey bacillus is the infectious agent.

Signs and Symptoms

- Soft painful sore on penis, vagina or anus
- Swollen lymph nodes in the groin that contain pus, may open and drain pus and scar up.

Lymphogranuloma venereum

A veneral disease cased by chlamydia trachomatis, most commonly manifested by acute inquinal lymph adenitis

Signs and symptoms

- Swollen lymph nodes in the groin that may open and drain pus
- Painful oozing sores around the anus
- Enlarge genitals, abscesses around the anus, narrowed rectum , anal fistula.

Candidiasis

A fungal infection usually confined to superficial layers of skin or mucous membranes, presenting clinically as oral thrush or vuluovaginitis

Signs and symptoms

- intense vaginal burning and itching
- clumpy white fluid in and around the vagina
- itchiness of the genitals in men

Gonorrhea

An acute or chronic purulent infection of the urogenital tract.

Sign and symptoms

In woman
- unusual vaginal discharge
- unusual vaginal bleeding
- lower abdominal pain

In man
- painful urination
- drops of pus from the penis

Trichomoniasis

A common and persistent protozoal disease of the genito- urinary tract caused by Trichomonas virginals

Signs & symptoms

Woman - Vaginal burning and itching
- Foamy, green- yellow fluid with a bad smell from the vagina
- Pain or burning when urinating

Man **-** Watery white fluid from the penis

- Pain or burning when urinating

Prevention

Household members and other close contacts with AIDS patients should be the main focus of the prevention and control program. Besides they are part and parcel of the HIV/AIDS treatment because, for the time being, health sector resources that can provide services for this situation are so minimal that home care of patients will continue to be the mainstay of treatment. Therefore, there is a need for an easy and acceptable method of discussion about the disease, its causes and manifestations, transmission routes, control, and treatment measures at house hold level. The following are the main methods for the prevention of HIV/AIDS and other STIs:-

- Abstain from sexual intercourse before marriage
- Remain faithful to partner after marriage
- Use condoms in cases of extra marital sexual inter course
- Avoid sharing piercing objects (blades, needles etc)
- Avoid harmful traditional practices such as uvula cutting, circumcision, tooth extraction, tattooing, skin incision, etc
- Prevent mother to child transmission of HIV. Mother to child transmission can be prevented by advising:-

- women to do HIV testing before marriage and during pregnancy
- Women with HIV to use contraceptive condoms
- Pregnant women to take the drug that prevent mother to child transmission. They should be referred to health facility where the necessary drugs are available.
- Advising and encouraging women to deliver to a nearby health facility.
- After the child is born, if possible try to give cow's or artificial (formula) milk, if not possible give breast milk for not more than four months and advice to completely stop breast feeding after four months.

Review Questions

1. List the three main routes of transmission of HIV.
2. Mention risk behaviors related to HIV/AIDS.
3. Describe the preventive measures against acquiring HIV infection.
4. Is it possible to give care to PLWHA at home? How would families and communities care for PLWHA?

UNIT THREE

Malaria

3.1. *Objectives:*

General objectives: at the end of this unit, the trainee will be able to help the community to reduce the burden of morbidity and mortality due to malaria.

Specific objectives: at the end of this unit, the trainee will be able to:-

- Collect data on malaria using standard format.
- Enable the community to participate in malaria prevention and control
- Guide and encourage households to eliminate mosquito breeding sites.
- Enable all households to undertake indoor residual insecticide spraying.
- Promote the use of ITNS by house holds by educating them.
- Dispense malaria treatment drugs for sick household members.
- Mobilize the community to control and prevent malaria epidemics.

Introduction

Malaria is one of the leading causes of morbidity and mortality in Ethiopia. About 75% of the areas in Ethiopia are malarious and 67% of the population is at risk of getting malaria infection. It has been reported that cyclic, large scale and devastating epidemics of malaria have occurred in Ethiopia. Natural and human made disasters, and developmental activities such as irrigation have also contributed to this situation. Effective preventive and control measures with early diagnosis and treatment of cases can significantly reduce the morbidity and mortality from malaria.

Definition

Malaria is an acute infection of blood caused by protozoa of the genus plasmodium through the bite of an infected female anopheles mosquito. The mosquito breeds in sunlight with small clean water collection. Plasmodium Falciparum, Vivax, Ovale and Malariea are the main species of genus plasmodium that causes malaria. Among these Plasmodium Falciparum and Vivax are the most common in Ethiopia.

Methods of Transmission

Malaria is a vector borne disease. It is mainly transmitted from infected person to the healthy person by the bite of female anopheles

mosquito. The bite takes place during the dark and cool hours of the day. Although rare, malaria can be transmitted through blood transfusion, placenta and inoculation accidents. Mosquitoes breed in sunlight, small stagnant water collections in the residential areas e.g. Plastic materials, broken glasses and clay posts).

Signs and Symptoms

- high grade fever
- Malaise, headache
- Sweating and shivering
- Muscle ache, joint pain
- Nausea, vomiting, loss of appetite, abdominal pain, diarrhea and thirst.

The symptoms and signs of malaria may be confused with other diseases that cause fever such as measles, pneumonia, tonsillitis, otitis media (middle ear infections) and upper respiratory tract infections. In children failure to feed and fever should be considered seriously

Danger signs of Malaria

- altered consciousness
- Not able to drink or feed
- Frequent vomiting
- Convulsion
- No urine out put in the last 24 hrs.

- Bleeding
- Jaundice (yellowish discoloration of sclera)
- Difficulty in breathing

Risk Factors

Young children, travelers who are non-immune, refugees, displaced people, pregnant women (malaria causes Abortion, Maternal and fetal death, Premature labor and anemia during pregnancy) and laborers entering malarious areas are groups which are at risk of getting malaria. People in rural areas with limited access of health services are the most affected.

Diagnosis:

Knowing the symptoms of malaria is very important .At community level; the diagnosis of malaria is based on signs and symptoms. In an area where malaria is common, presence of fever or history of fever at least within the past two days is adequate to make diagnosis of malaria. Asking patients for recent travel to a place where malaria is common is helpful when malaria is not a problem in the area. Community mobilization for blood sample survey is very important in the diagnosis of malaria at the community level.

Malaria Diagnosis and Treatment:-

Diagnosis

Malaria diagnosis should be based on the patient's symptoms, signs and history; and/or result or Rapid Diagnostic Test (RDT). For suspected clinical malaria with negative RDT results, other cause of fever should be suspected.

In malarious area, a patient with fever or a history of fever at least within the past two days is assumed to have clinical malaria.

In a non-malarious area, a patient with fever or history of fever at least with in the past two days and with a history of travel to malarious area within the last two weeks is assumed to have clinical malaria. However other common causes of fever such as measles, pneumonia, meningitis, upper respiratory tract infections should also looked for.

Treatment:

Drug therapy:

Artemether-lumefantrine (administered orally 2 times a day for 3 days) is the first-line drug for the treatment of all uncomplicated clinical malaria cases and for RDT confirmed falciparum malaria cases (except pregnant women and infants under 5 kg body weight).

Pregnant women and infants under 5 kg body weight will be treated with oral quinine 3 times a day for 7 days (see Annex 2) For all RDT negative cases with clear clinical signs and symptoms of malaria, it could be convincing to consider vivax malaria for which treatment with chloroquine at a dosage of 25 mg/kg administered over three days should be started promptly and the patient referred to the next higher level of health facility. For patients with RDT negative results other causes of fever should also be looked for and treated and/or referred accordingly.

- In addition tell the patient that:
  - He/She has got malaria;
  - Malaria is transmitted by mosquitoes;
  - Malaria can be prevented by eliminating mosquito breeding places and by using insecticide treated mosquito nets;
  - Early treatment is important to prevent severe illness and death due to malaria; and
  - To take/give enough food and fluid (especially, fatty meal, to enhance drug absorption and to avoid risk of hypoglycemia).
  - To return to the health post if fever persists or he/she is still sick after or anytime before 72 hours if conditions worsen.

For the treatment of malaria in pregnant women and children less than five kg body weight the first line treatment is oral quinine. Oral quinine is administered 3 times a day for 7 days.

Supportive treatment:

A patient with uncomplicated malaria may require additional treatment to correct conditions such as dehydration, high fever and anemia:

- In case of high fever (rectal temperature of above 39^0c in children) give paracetamol and advise the patient to take warm shower or receive tepid sponging and fanning; and
- For patients with moderate dehydration, give oral rehydration salt, i.e. ORS (refer to the first aid package about the procedure) and also advise the patient to take increased amount of clean water or other fluids. In the case of infants, encourage mothers to provide extra breast-feeding.

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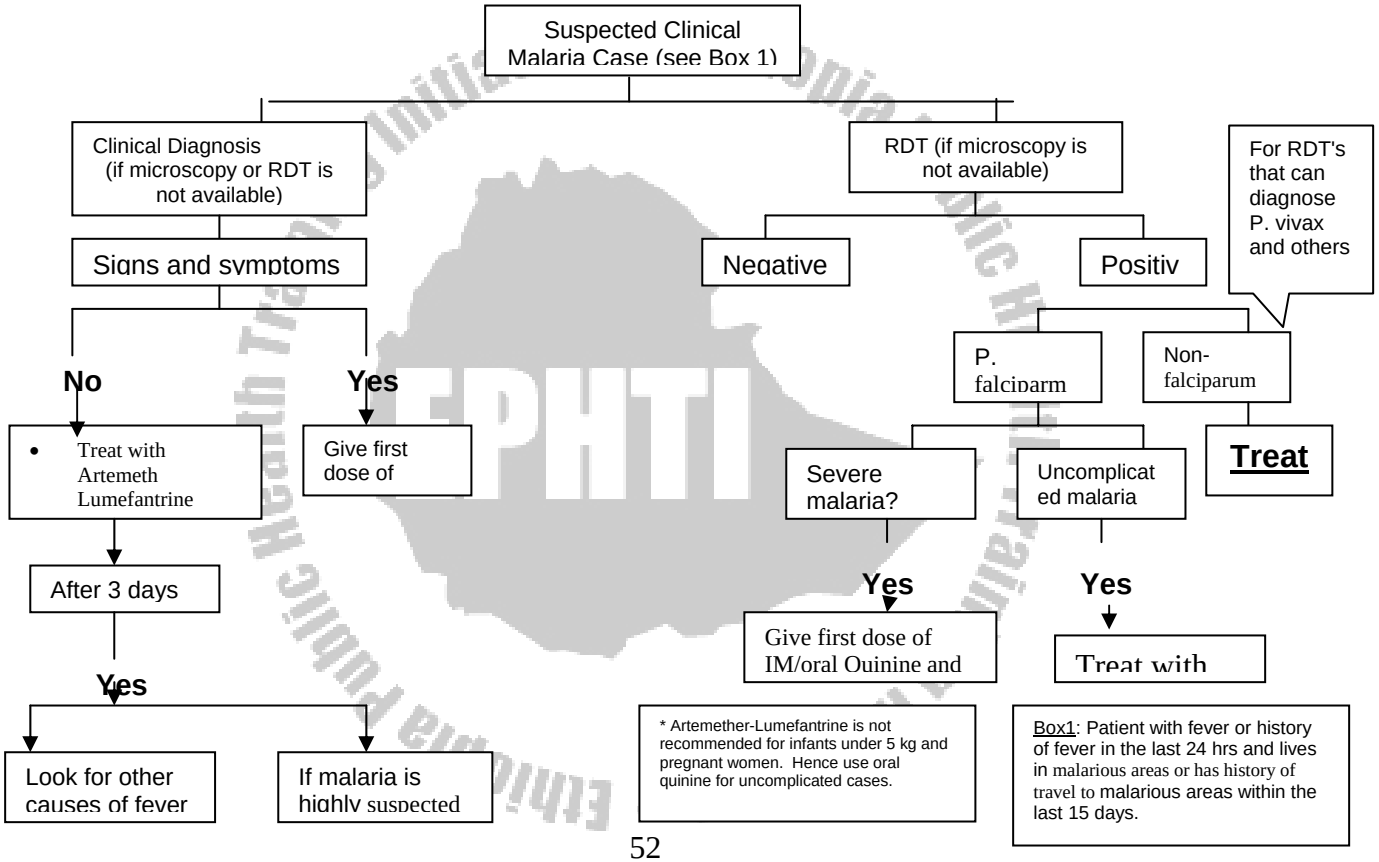
Suspected Clinical Malaria Case (see Box 1)
Clinical Diagnosis (if microscopy or RDT is not available)
RDT (if microscopy is not available)
For RDT's that can diagnose P. vivax and others
Signs and symptoms
Negative
Positiv
No
Yes
P. falciparm
Non-falciparum
Treat with Artemeth Lumefantrine
Give first dose of
Severe malaria?
Uncomplicated malaria
Treat
After 3 days
Yes
Yes
Give first dose of IM/oral Quinine and
Treat with
Yes
Look for other causes of fever
If malaria is highly suspected
* Artemether-Lumefantrine is not recommended for infants under 5 kg and pregnant women. Hence use oral quinine for uncomplicated cases.
Box1: Patient with fever or history of fever in the last 24 hrs and lives in malarious areas or has history of travel to malarious areas within the last 15 days.

Follow-up

In a patient who started treatment with Artemether-lumefantrien, if fever and other causes of illness persist, the patient should be advised to come back within 72 hours (3 days). However, patients should also be advised to come anytime before 72 hours if conditions worsen or unable to take oral medication. For all patients who come back to the health facility, full assessment should be done and appropriate action taken.

- Assess the overall condition of the patient,
- If the patient has not taken the full course of treatemtn, administer the remaining dose of treatment,
- If patient has taken full course of Artemether-lumefantrien and still has clinical sign and symptom of malaria, start the first dose of chloroquine and refer,
- If other causes of fever are suspected, treat accordingly and/or refer patient to the nearest health center.

Referral:

A patient with one or more of the following conditions should be referred immediately to the nearest health center or hospital.

- Altered consciousness (e.g. confusion, sleepy, drowsy, coma);
- Not able to drink or feed;
- Frequent vomiting;

- Convulsion or recent history of convulsion;
- Unable to sit or stand up;
- No urine output in the last 24 hours;
- Bleeding;
- Jaundice;
- Pallor (anemia)
- Difficult in breathing;
- Persistent fever
- Sever dehydration and
- Other conditions that cannot be managed at this level.

As a routine measure the following should be done before referring of the patient.

- If the patient is conscious and can swallow the drug, give first dose of oral quinine before referral;
- To reduce fever use tepid sponging and fanning and if patient can swallow give paracetamol;
- If the patient can swallow, give fluids such as ORS; and
- Indicate all the findings and drugs given on the referral paper.

Malaria Epidemic Prevention and Control:-

An Epidemic is the occurrence of cases in excess of the number expected in a given place and time period.

The transmission of malaria commonly shows variation in time:

- Season:-determined by rainfall;
- Periodic: cycles of several (after 8-10) years usually determined by rainfall (and also temperature) and amplified by loss of immunity in periods of low transmission; and
- Secular: long-term periods.

Malaria Epidemic Precipitating Factors;

1. Climatic change:-

   Rain fall:

   When there is abnormal rain fall in the form of excess or deficit, mosquito breeding sites are created in abundance. Similarly, when the numbers of rainy days in a specified period becomes few and also in dry seasons water on rivers and streams decrease and creates small intermittent pools of stagnant water ideal for mosquito breeding sites.

Temperature:

When there is increase of air temperature in high and temperate areas the life cycle of mosquitoes and malaria parasites within the mosquito host is shortened. These phenomena will lead to high mosquito density within short periods of time and leading, of course, to high malaria transmission.

Humidity:

1. Humidity affects transmission by increasing the longevity of adult vectors:
2. Water resource development: the development of dams, and irrigation; programmes create conducive situations for malaria epidemic;
3. Reduced or weakened vector control activities;
4. Development of insecticide resistance;
5. Death of cattle due to disease and drought makes mosquitos exclusively feed on humans.
6. Migration of non-immune people from high to low land and vice versa; and
7. Resistance to anti malaria drugs.

Epidemic Monitoring and Surveillance system:

Methods of epidemic forecast and detection:-
There are three levels of epidemic monitoring and surveillance system.

These are:-
Level 1: Meteorological information;
Level 2: Entomological information; and
Level 3: Morbidity information.

These methods will be used for forecasting and detection of epidemics in levels one to three respectively. The accuracy of epidemic forecasting increases from the first level to the third, but timeliness of detection is usually compromised as one goes along the three levels.

Level 1: Meteorological information:

Rainfall:

Rainfall affects malaria transmission in the following ways:-

- When there is a continuous and heavy rainfall, most water collections are disturbed and thus mosquito breeding is unlikely during the rainy period. However, as soon as the frequency and intensity of rainfall decreases, it is likely that numerous favorable mosquito-breeding sites will be created as a result. Heavy rainfall in the high lands may also cause floods in the low lands, which creates pools of stagnant water ideal for mosquito breeding;
- When the number of rainy days in a specific period becomes few (and there is intermittent rainfall which is not so high) most of the rain pools become favorable breeding sites;

- If the amount of rain is much below normal or if there is drought, water bodies such as streams and rivers will create small intermittent pools in river bed which are also favorable for mosquito breeding. Especially when such phenomena are coupled by high air temperature, unusual epidemics may occur in high land or high land-fringe areas; and
- Apart from creating mosquito breeding sites, rainfall also affects malaria transmission through increasing humidity, which in turn will help to increase the longevity of the adult vectors.

Air temperature:

Temperature affects transmission in four major ways;-

1. High temperature speeds up the development of the life cycle of a mosquito;
2. High temperature affects and accelerates the length of the development of the life cycle of malaria parasite with in the mosquito host;
3. An average daily temperature of about 30^0c is lethal to the sporogonic stages of the parasite within the mosquito vector; and

4. Extremely high temperature (aabove 30^0c) is also unfavorable to the vectors, as adult longevity may be reduced especially in arid environment.

Humidity:-

Humidity affects transmission by increasing the longevity of adult vectors. Usually, anophelenes prefer relative humidity exceeding 60%.

Contribution by individuals and groups in Malaria Prevention and Control Programme:

Individual and household:

It is possible to protect oneself and family from the bites of mosquitoes. The protective measures are:

- Carefully cover your body to reduce areas exposed to mosquito bites in the night;
- Apply to your skin repellent creams:
- Use insecticide treated mosquito nets;
- Protect windows and doors with wire mesh or made of local material; (e.g. sisal; grass etc);
- Spray in the night mosquito killer insecticide (Aerosol).
- Mosquitos more in the night, hence don't often open doors; and

- Keep domestic animals in stable outside the house to reduce mosquito movement into the house.

Community, government organizations and NGOs:

Community:-

- It is possible to control malaria by carefully identifying places for human dwelling. As the flight range of mosquito is limited to 2 km., it is advisable to locate human dwellings at least 2 km. away from the breeding location. In addition, houses must be built against the wind direction so that mosquito will not reach the houses with the push of the wind;
- Participate and demonstrate in action, education provided on malaria prevention and control measures; and
- Communities should participate in vector control activities in terms of labor and materials; and
- Communities should participate in residual house spraying by selecting spray men and providing them the necessary support.

Government Organization:

- When water collections in ponds and other structures are under way, it is essential to see that no mosquito breeding sites are created in the surrounding;

- Organizations engaged in road construction should see that ditches and dugged areas are filled and leveled to eliminate water collections;
- Development organizations employ a large number of daily laborers during harvest seasons, but the organizations should select places that are not highly exposed to malaria risks and should always apply control measures in collaboration with the health extension worker.

Non Governmental Organizations:-

- NGOs and other international organizations are expected to participate and collaborate in the national and local malaria prevention and control efforts in terms of training, materials and finance.

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Review Questions

1. The important vector in the transmission of malaria is _____.
2. _____ % of the land in Ethiopia is malarious.
3. List the parasites that cause malaria.
4. Describe the preventive measures of malaria infection.
5. Define malaria epidemics.

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Glossary

Abortion- The delivery of a fetus before 20 weeks gestation or the delivery of a fetus less than 500mg.

Anemia- A condition where the level of red blood cells is less than normal of where the hemoglobin is less ,making it more difficult for the blood to carry oxygen.

Anopheles- The type of mosquito that carries the malaria parasite.

Case- An infected of diseased person or animal having specific clinical or laboratory characteristics.

Chemotherapy- The treatment of diseases with the use of Chemical substances.

Chemoprophylaxis- The administration of chemicals including antibiotics, to prevent the development of an infection.

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.

Counseling – Advising, educating, informing of all possible outcomes and also allowing persons to express feelings and questions.

Diagnosis- Statement of the nature of a disease condition made after observing its signs, symptoms and other indications.

Epidemic- Occurrence of a disease in an excess of usual or normal prevalence.

Health Education- Is the process by which individuals and groups of people learn to behave in a manner conducive to the promotion, maintenance or restoration of health.

Hetrosexual-Having sex to the people of the opposite sex.

Immunity- The ability of the body to resist a disease.

Immunodeficiency- A weakening or deficiency in the immune system.

Iritis- Inflammation of the iris.

Jaundice- Excess of the bile pigment in the blood leading to yellowish discoloration of the white part of the eyes and the skin.

Kaposis Sarcoma- Cancer which takes the form of many hemorrhagic nodes affecting the skin especially on the extremities.

Keratits- Inflammation of the cornea.

Macule- a flat non palpable areaof change in the skin color less than 1cm in diameter.

Nodule- A solid mass less than 1cmin diameter.

Opportunistic Infection- Infections that occur when the defense mechanisms of the body are weakened.

Premature Labor- Uterine contractions with cervical effacement and dilation before 37 weeks' gestation.

Papule- A flat non palpable area of change in skin color greater than 1cm in diameter.

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