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Lecture 2-

General epidemiology

Epidemiology:

Uses of Epidemiology:

- 1- Historical study.. is community health improving, getting better or worse, by computing rates over time.
- 2- Community diagnosis.. the actual and potential health problems in the community, their nature, impact and diagnosis.
- 3- Working of health services.. efficiency, effectiveness and efficiency of health services that help in health services administration for future needs.
- 4- Individual risks and chances.. as actual risk and health hazard appraisal.
- 5- Completing the clinical picture.. it is the original illustration of the uses of epidemiology.
- 6- Identification of syndromes.. the investigations sometimes make it possible to group together several differing manifestations of a condition or to separate seemingly identical diseases into more than one category (Hepatitis→ A & B, Leukemia→lymphatic & Myeloid)
- 7- The search for causes.. by identifying causal factors or at least risk factors.
- 8- Evaluation of presenting symptoms and signs of disease.
- 9- Clinical decision analysis about the best methods of managing patients with particular disease.

Comparison between Clinical & Epidemiological Approach:

	Clinical	Epidemiological
Aetiology	Cause of developing a disease in individual	Causes of spread of disease in community
Unit of study	Case or cases	Defined population or population at risk
Consideration	Concerned with disease in the individual patient	With disease patterns in the entire population
Diagnosis	Identifying disease in an individual	Identify the magnitude of disease in community
Therapy	Recovery	Control & eradication

The epidemiological sequence:

- 1- Observation.
- 2- Counting cases or events.
- 3- Relating cases or events to the population at risk.
- 4- Making comparisons.
- 5- Developing the hypothesis.
- 6- Testing the hypothesis.
- 7- Making scientific inferences.
- 8- Conducting experimental studies
- 9- Intervention and evaluation.

Epidemic:

Is an unusual increase in frequency of disease above the expected (endemic) occurrence, revealing itself in a relatively short period of time.

Endemic:

It is the habitual presence of a disease within a geographical area or the usual occurrence of a disease within such area. A disease continuously present in a population is endemic to that population.

Pandemic:

The occurrence of a disease in epidemic form affecting countries sequentially or at the same time.

Community Medicine:

Can be defined as the combination of sciences, skills & beliefs that are directed to the maintenance & improvement of the health of the people.

Modern Medicine includes;

1-Curative medicine:

It is **defined** as the treatment of the disease by the use of a drug which produces a reaction that itself neutralize the disease.

It's primary **objective** is the removal of the disease from the patient (rather than from the mass). It employs diagnostic techniques and treatment.

2-Preventive medicine:

It is a branch of medicine distinct from public health applied to healthy people concerned primarily with preventing physical, mental, & emotional disease and injury, customarily by actions affecting large numbers or population.

Its primary **objective** is prevention of disease and promotion of health (e.g. through vaccine, antisera, quarantine, nutrition, recently through screening for the diagnosis of the disease in it's pre symptomatic stage).

Concept of Health:

Health is a state of complete physical, mental and social well being and not merely and absence of disease or infirmity (WHO definition). Health is a state of dynamic equilibrium between man and his environment.

Concept of Disease

Disease is maladjustment or disequilibrium between man and his environment.

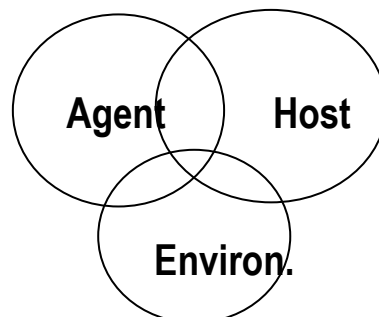
Natural history of disease:

Natural history of disease signifies the way in which a disease evolves in the absence of intervention. It comprises two phases:

- a. Pre-pathogenesis phase.
- b. Pathogenesis phase.

Pre-pathogenesis phase:

This refers to the period preliminary to the onset of disease in man. During this phase, man is not yet involved, but he is very much in the "midst of disease" or to the risk of disease. During this phase the three epidemiological factors that are involved in disease occurrence (**Agent, Host & Environment**) are in isolation. But when the "interact" man moves from the pre-pathogenesis to pathogenesis phases. These factors are commonly referred to as the "**epidemiological triad**" or "**ecological triad**", these factors determine the onset of disease as well as the distribution of disease in the community.



Pathogenesis phase:

It begins with the entry of disease agent in the human host. There is a time between the entry of the disease agent and onset of clinical signs & symptoms of disease this is known as the Incubation period. Which varies from one disease to another. During this period there is tissue & physiological changes. Which could be subclinical (difficult to be recognized by the usual methods of diagnosis).

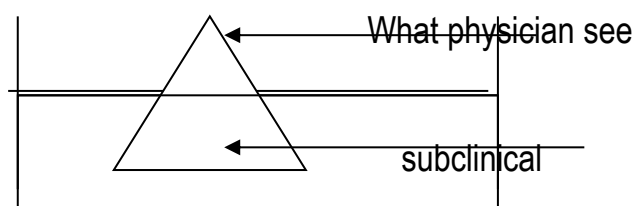
After the IP when health equilibrium is disturbed the signs & symptoms of disease begin to appear, in the first few days of illness these signs & symptom are not clear-cut "**early pathogenesis phase**", but as disease advances, they usually become clear-cut to make a clinical diagnosis.

The end result of disease process may be complete recovery, chronicity, disability or death.

The iceberg of disease:

Disease in a community may be compared with an iceberg. The floating tip of the iceberg represents what physician sees in the community i.e. clinical cases. The "water line" represents the demarcation between apparent and inapparent disease. The submerged portion of iceberg represents the hidden mass of disease i.e. latent, inapparent, presymptomatic or subclinical cases, carriers, and undiagnosed cases in the community.

Mostly the hidden portion far exceeds the exposed part of the iceberg thus constitutes an important, undiagnosed reservoir of disease in the community, and its detection and control is a challenge to modern techniques in preventive medicine.



The Concept of prevention:

Prevention levels;

1. **Primordial:**
2. **Primary:** refers to the actions taken prior to the disease development in man (done by **health promotion and specific protection**).
3. **Secondary:** denotes the identification of people who have already developed the disease at an early stage in the disease's natural history (**Early diagnosis & treatment**).
4. **Tertiary:** it is the prevention of disease potential consequences or complications (By **disability limitation and rehabilitation**).

Health promotion:

It is the strengthening of the host by improving the general health and quality of life of individuals and communities through:

- 1- Improving food distribution & nutrition.
- 2- Basic sanitation e.g safe water supply, sewage disposal, refuse disposal, control of insects and rodents
- 3- Personal hygiene
- 4- Health education of the public
- 5- Improving the general level of education.
- 6- Periodic health screening
- 7- Increasing the physical fitness of the population
- 8- Marriage counseling
- 9- Genetic counseling
- 10- Limitation of the availability of alcohol, tobacco, and other hazardous material to health.
- 11- Family planning & good child rearing.
- 12- Improving the standard of living of people.
- 13- Health legislation.

Health promotion measures should be applied mostly to the target group or at risk individuals in the population.

Specific protection:

By specific protection we mean that we are going to give a protection of certain human being against specific disease, it include;

1. Immunization
2. Use of specific nutrients
3. Chemoprophylaxis
4. Protection against occupational hazards.
5. Protection against accidents
6. Protection from carcinogens
7. Avoidance of allergens
8. Control of hazards in the environment

Early diagnosis and treatment:

The earlier a disease is diagnosed & treated the better it is from the point of view of spread of disease in the community, and any long-term disability.

Early diagnosis & treatment through;

1. Case finding measures
2. Screening
3. Periodic examination
4. Selective examination of people at high risk.

Disability limitation:

It is to halt the disease process by instituting appropriate treatment and there by limit the disability (any restriction or lack "resulting from an impairment" of ability to perform activity in the normal range for human being).

It is through:

- 1- Reducing the occurrence of impairment e.g. immunization against polio
- 2- Disability limitation by appropriate treatment
- 3- Preventing the transition of disability into handicap.

Rehabilitation:

Defined by WHO as the combined and coordinated use of medical, social, educational & vocational measures for training & retraining the individual to the highest possible level of functional ability, and at enabling the disabled and handicapped to achieve social integration.

It involves medical, vocational, social, and psychological rehabilitation.

Rehabilitation makes productive people out of non-productive people.

Prevention:

It is also can be refereed as 3 levels;

- 1- Primordial prevention
- 2- Primary prevention
- 3- Secondary prevention
- 4- Tertiary prevention

Primordial prevention:

It is a new aspect, it is receiving special attention in the prevention of chronic diseases, this is primary prevention in its purest sense, that is, prevention of the emergence or development of risk factors in countries or population groups in which they have not yet appeared. For example, many adult health problems (obesity, hypertension) have their early origins in childhood, because this is the time when lifestyle are formed (smoking, eating patterns, physical exercise). In primordial prevention, efforts are directed towards discouraging children from adopting harmful lifestyles. The main intervention in primordial prevention is through individual and mass education.

Primary prevention:

It refers to action taken prior to the onset of disease to remove the possibility that a disease will ever occur.

It comprises the first two levels of prevention; health promotion & specific protection.

The goal of primary health is not merely the prevention of early mortality & thus prolongation of life but even the prevention of morbidity following the statement An **OUNCE OF PREVENTION IS WORTH A POUND OF CURE**

Secondary prevention:

It comprises the third level of prevention i.e. early diagnosis & treatment, it defined as an action which halts the progress of disease at its incipient stage & prevent complications.

It is the domain field of clinical medicine action, it seeks to relieve pain, arrest or cure diseases prevent disability & death and prevent spread of disease in the community.

Tertiary prevention:

It is the prevention of disease potential consequence, but not the diseases through disability limitation a rehabilitation levels of prevention.