

CONCEPT OF DISEASE

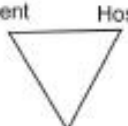
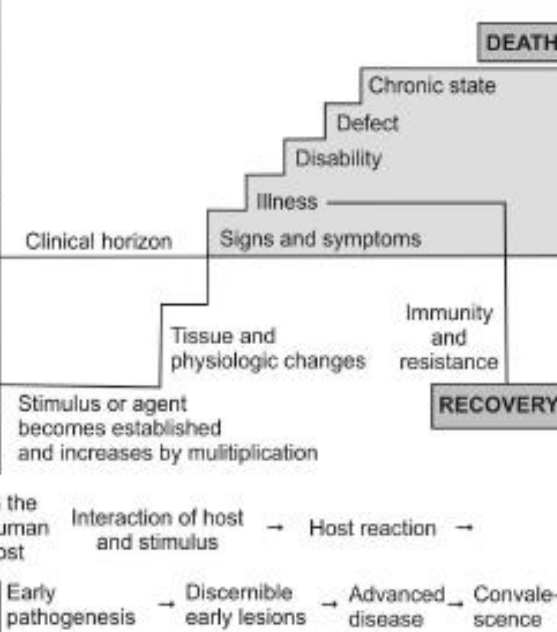
Discuss the concept of “Natural history of disease” (8 marks)

- Natural history of disease means the evolution of the disease in an individual from its earliest stage of its prepathogenesis till the final stage of the disease, which is either recovery, disability or death, in the absence of treatment or prevention.
- Natural history disease is best established by **cohort studies**.

Phases of natural history of disease

i) Pre-pathogenesis phase (i.e., the process in the environment)

ii) Pathogenesis phase (i.e., the process in man)

PERIOD OF PREPATHOGENESIS		PERIOD OF PREPATHOGENESIS		
Disease process	→ Before man is involved → Agent Host  Environmental Factors (known and unknown) Bring agent and host together or produce a disease providing stimulus	→ The course of the disease in man → 		
		In the human host Interaction of host and stimulus → Host reaction →		
		Early pathogenesis → Discernible early lesions → Advanced disease → Convalescence		
LEVELS OF PREVENTION	PRIMARY PREVENTION	SECONDARY PREVENTION	TERTIARY PREVENTION	
MODES OF INTERVENTION	HEALTH PROMOTION SPECIFIC PROMOTION	EARLY DIAGNOSIS AND TREATMENT	DISABILITY LIMITATION	REHABILITATION

Pre-pathogenesis phase of disease

- Period before the onset of disease in man.
- In order to initiate the onset of disease an **interaction** between the agent, host and environment is necessary.
- Sometimes the equilibrium may get disturbed on interaction, the disease process starts and may range from a single case to epidemic.

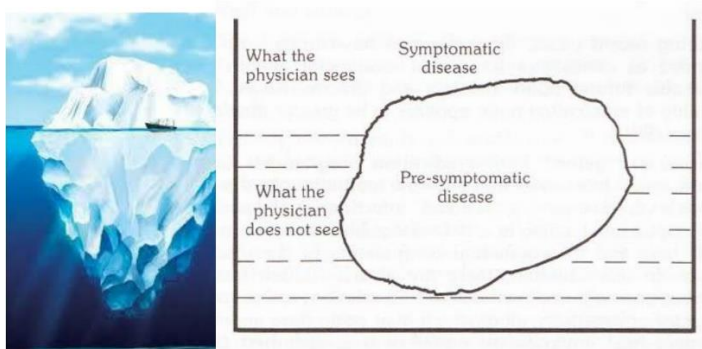
Pathogenesis phase of disease

- Begins with the entry of causative agent in the human host.
- In this phase the agent multiplies and induce tissue and physiological changes leading to signs and symptoms.
- The final outcome may be recovery, disability, chronic illness or death.
- Also, in this phase the infection may be clinical or subclinical, typical or atypical or host may become a carrier with or without having developed clinical disease.
- In chronic diseases there is a presymptomatic phase, by the time the signs and symptoms appear the disease may be already well advanced.

ICEBERG PHENOMENON

- According to this concept disease in a community may be compared with an iceberg.
- The tip of the iceberg represents the symptomatic cases that are seen by the physician.
- The submerged portion represent the hidden mass of disease i.e., latent, inapparent, presymptomatic, carriers and undiagnosed cases in the community.
- The waterline represents the demarcation between apparent and inapparent diseases.
- Diseases like HTN, diabetes, anaemia, malnutrition and mental illness show typical iceberg phenomenon.

Iceberg Phenomenon of Diseases



- Rabies, tetanus, measles, rubella does not show iceberg phenomenon.
- Screening is done for hidden portion and diagnosis for the tip.
- The submerged portion can perpetuate the disease in the community and keep its prevalence high.
- The main challenge to public health is the absence of easy and cost-effective method to detect the subclinical cases- the bottom of the iceberg.

LEVELS OF PREVENTION AND MODES OF INTERVENTION AT EACH LEVEL

Primordial prevention

Prevention of emergence or development of risk factors in countries or population groups in which they have not yet appeared.

Applicable for prevention of non-communicable diseases, like hypertension, diabetes, cancer etc.

Interventions

Individual education

Mass education

Discouraging children from adopting harmful lifestyles or risk factors (unhealthy diet rich in fats, high salt intake, physical inactivity, smoking, alcohol etc.) by individual and mass education.

Primary prevention (very imp)

Action taken prior to the onset of disease where risk factors are already established.

Aim of primary prevention is to reduce the incidence of the disease.

Primary prevention is now applicable to chronic diseases via two approaches.

- Population strategy: measures are directed to all the people of community irrespective of individual risk.
- High risk strategy: preventive care to individuals at high risk.

Interventions

- Health promotion
- Specific protection

Health promotion: It is the process of enabling people to increase control over, and to improve health. It includes,

- ***Health education:*** creating awareness among people about the disease which includes general public, patients, priority groups, health providers, community leaders and decision makers
- ***Environmental modification:*** Provision of safe water, installation of sanitary latrine, control of insects and rodents, improvement of housing
- ***Nutritional Interventions:*** Food distribution, Nutritional improvement, child feeding programme, food fortification, Nutritional education
- ***Lifestyle and behavioural changes:*** promoting physical activity, developing healthy food habits etc.

Specific protection

- immunization
- use of specific nutrients
- chemoprophylaxis
- protection against occupational hazards

- protection against accidents
- protection from carcinogens
- avoidance of allergens
- the control of specific hazards in the general environment, e.g., air pollution, noise control
- control of consumer product quality and safety of foods, drugs, cosmetics, etc.

Secondary prevention

- Actions which halt the progress of a disease and its incipient stage and prevent complications.
- Aim is to reduce the prevalence of disease by shortening its duration.
- National health programmes by GOVT of India operate at secondary level of prevention.

Interventions

Early diagnosis and treatment

- **Early diagnosis** can be done through case finding, screening/survey, selective examination e.g. screening of cervical cancer by pap smear examination, screening for hypertension, contact tracing for STI etc.
- **Treatment** modalities include individual and mass treatment. it reduce period of communicability, duration of illness and development of secondary cases.
- Individual treatment involves treatment at individual level such as DOTS for Tb, multi drug therapy for leprosy etc.
- Mass treatment is administration of treatment to entire population in a defined area such as mass treatment in filariasis, trachoma etc.
- Rationale for mass treatment is the existence of at least 4-5 cases of latent infection for each clinical case of active disease in the community.

- **Tertiary prevention**

All measures taken to reduce or limit impairment and disability, minimize sufferings and promote patients' adjustment to irremediable conditions.

Aim is to reduce the number and impact of complications.

Interventions

Disability limitation

Rehabilitation

Disability limitation aims to prevent the transition of disease process from impairment to handicap.

E.g. Keeping blood sugar, Bp under control, prevention of opportunistic infection in HIV patients etc.

Rehabilitation: it is the combined and coordinated use of medical, social, educational and vocational measures for training and retaining the individual so that maximum functional ability is achieved.

Aim is to make a nonproductive person productive.

Following are areas of concern in rehabilitation

- Medical rehabilitation – restoration of function.
- Vocational rehabilitation - restoration of the capacity to earn a livelihood.
- Social rehabilitation – restoration of family and social relationships.
- Psychological rehabilitation - restoration of personal dignity and confidence.

E.g. schools for blind, Provision of crutches for crippled

Special schools for mentally retarded children

Reconstructive surgery in leprosy

The germ theory of disease takes one sided view of causation

- According to germ theory by Louis Pasteur, disease is caused by microorganism.
- Only explain one-one relationship between causal agent and disease.
- It is now recognised that the **causation of disease is multifactorial**, and rarely caused by a single agent.
- All those who are exposed to an agent does not suffer from disease
- It also does not explain the spread of disease by asymptomatic

Primary health care is the method of choice for achieving health for all

- It is the first level of contact between the individual and the health system where essential health care is provided.
- Majority of prevailing health complaints and problems can be satisfactorily dealt at this level.
- It is closest to the people.
- Primary health care is provided by subcentres and primary health centres with community participation.

Components of an epidemiological hypothesis

Disease frequency: Measurement of frequency of disease, disability or death and expressed in the form of rates and ratios (prevalence rate, incidence rate, death rate)

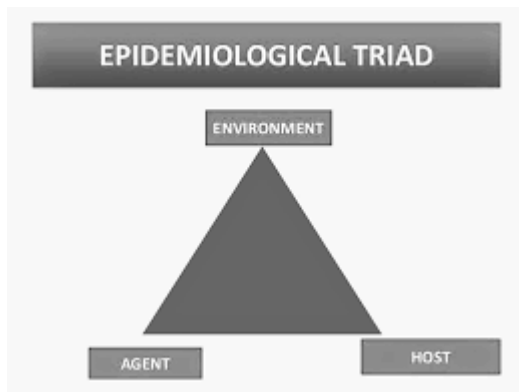
Distribution of disease: deals with pattern of distribution in various subgroups of population by time, place and person.

Determinants of disease: Etiological hypothesis

EPIDEMIOLOGICAL TRIAD

It is a concept used to explain the causation of a disease, especially the infectious disease.

This concept was evolved because germ theory was not able to explain why some individuals do not develop the disease in spite of being exposed to causative organism.



Agent factors:

- It is an infectious or non-infectious substance that cause the disease.
- It includes infectious agents such as bacteria, virus, fungi, parasite and non-infectious such as nutrient such as excess or deficient, physical (heat, cold, pressure, radiation) chemicals (dust, gas, insecticides) mechanical agents and social agents (poverty, smoking, abuse of drugs or alcohols)

Host factors:

- Organism that harbours the disease.
- Effect of the organism depends on immunity, genetic makeup, level of exposure as well as state of health.
- The host factors include demographic characteristics (age, sex, ethnicity) biological characteristics (genetic, biochemical, immunological, physiological factors) social and economic characteristics (status, education, occupation) and lifestyle factors etc.

Environmental factors

- Surroundings in which the pathogen lives and allow the disease transmission to occur.
- It includes physical environment (air, water, heat, light, radiation) biological environment (insects, rodents, animals) and psycho-social environment (migration, urbanisation, unemployment, poverty)