

Epidemiology - 6

Disease control

- reducing the transmission of disease agent to such a low level that it ceases to be a public health problem.

↳ It aims to reduce:

- incidence of the disease
- Duration of the disease
- effect of infection
- Financial burden of the community.

Disease elimination

- is complete interruption of transmission of disease in a defined geographical area
[but] the causative organism may be persisting in the environment.

↳ it's a geographical term (used only for a country or region)

Disease eradication

- Complete extermination of organism
(tearing out by roots of disease)

- complete interruption of disease transmission in the entire area of community.

↳ objective of eradication → eliminate the disease to the extent that no new case occurs in future.

→ it's a global term (can be used only for whole planet)

* only one disease till now eradicated (Smallpox - at 8/5/1980)

Notes

• For application of preventive measure → necessary to understand the pathogenic chain of the disease.

• Disease result from: complex interaction between man, agent and the environment.

Natural history of Disease: Key concept in epidemiology signifies the way in which a disease evolves over time.

(from earliest stage of its pre-pathogenesis phase to its termination)
as recovery, disability or death in the absence of treatment or prevention

* each disease has its own unique natural history
(not necessarily the same in all individuals)

notes: ① the physician see in the hospital is just an episode in the natural history of disease.

② epidemiologist study the natural history of disease in community
→ to fill the gap of our knowledge about the natural history of disease.

* Natural history of disease have 3 phases:

① pre pathogenesis : - The Period Preliminary to the onset of disease in man.
(the process in the environment)

- The disease agent has not yet entered man but the factor favour its interaction is existing in the environment.

• called ((man in the midst of disease))
((man exposed to the risk factor))

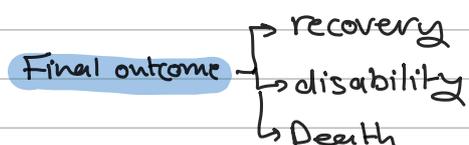
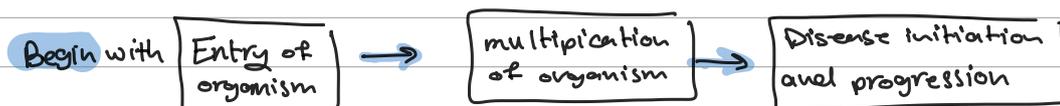
* potentially we are all in the pre pathogenesis phase of many communicable and non communicable diseases.

⇒ Causative factors of disease :

(Agent, Host, environment) ~ called Epidemiological triad

② Pathogenesis Phase : interaction of these 3 factors to initiate the disease process in man.

((the mere (only) presence of the 3 factors in the pre-pathogenesis period is not sufficient to start the disease.))



note!

The 3 factors determine (host, agent, environment)

→ The onset of disease (range from single case to epidemic)
→ The distribution of disease in community.

→ The Objective (aim) of preventive medicine is ⇒ to intercept or oppose the cause and thereby the disease.

⇒ The goals of preventive medicine:

- ① Promote health
- ② Preserve health
- ③ restore health when its impaired.
- ④ minimize suffering and distress.

Successful prevention depends on:

- ① Knowledge of causative.
- ② Dynamic of transmission
- ③ identify risk factors and risk groups
- ④ availability of prophylactic.
- ⑤ early detection and treatment measure
- ⑥ Organization for applying these measures (interventions) to appropriate person or groups.
- ⑦ continuous evaluation and development of these interventions

Interventions: any attempt to intervene or interrupt the usual sequence of development of disease.

may be by provider of:

- Treatment
- social support
- Education

→ 5 modes of intervention have been described:

- ① health promotion
- ② Specific Protection
- ③ early diagnosis and treatment
- ④ Disability limitation
- ⑤ Rehabilitation.

Levels of Prevention (all these levels are in relation to the natural history of disease)



- ① Health education.
- ② environmental modification.
- ③ Nutritional intervention.
- ④ lifestyle and Behaviour changes.

note: there is no precise boundaries between (1st, 2nd, 3rd) levels

ex: food supplement is primary to some members and secondary to others.

① Primordial prevention - new concept, related to prevention of chronic disease.

- prevention of the emergence or development risk factor in population in which they have not yet appeared. (primary prevention in its purest sense)

ex. → many adult health problem their origin in childhood (ex. hypertension, obesity) because its the time when life style form (smoking, exercise, eating pattern)

↳ so, effort are directed to discouraging children from adopting harm lifestyle

* The main intervention in primordial prevention is through individual and mass education.

② Primary Prevention - Action taken Prior to the onset of disease to (remove the possibility that a disease will occur)

- interventions in the prepathogenic phase of a disease or health problem.

* Accomplish by measures that promot general health and well being by:

1. Health Promotion = The Process of enabling person to increase control over and promote health. (not directed to specific disease).

↳ intended to strengthen the host through interventions:

Ⓐ health education : - one of the most cost effective interventions.

- large number of disease prevented with little or no medical intervention.

* The target for educational effort:

① general public

② Patients

③ Priority groups

④ health Providers

⑤ Community leaders

⑥ Decision makers.

Ⓑ Life and behavioural changes

- the action of prevention is one of the individual's responsibility for health (the physician and health worker act as an educator than therapist).

Ⓒ environmental modification

Ⓧ safe water - installation of sanitary latrines - improvement of housing - control of insects and rodents.

* The history improved that many inf. disease have been controlled by environmental modification even before the development of vaccine or chemotherapeutic drug.

Ⓓ Nutritional intervention

comprise : - Food distribution
- Nutrition education.

2. Specific Protection - the ideal way to prevent the disease altogether but is possible in only limited cases.

* include :

- immunization
- chemoprophylaxis
- Protection against accident
- avoidance of allergen
- control of specific hazard in specific environment
(ex : air pollutant - noise control)
- use of specific nutrients
- protection against occupational hazard
- protection from carcinogens
- quality and safety of food.

③

Secondary Prevention

- action that halts (stop) the progress of a disease at its incipient (early) stage and prevent complication.

⇒ The specific interventions :

- ① Early diagnosis (screening test, case finding programme)
- ② Adequate treatment before irreversible pathological changes happen.

- ⇒ Secondary prevention attempt to
 - arrest the disease process.
 - treating it before irreversible changes.
 - restore health by seeking out unrecognized disease

secondary prevention for infected person and primary for their potential contact. ↪ reverse communicability of inf. disease to protect other in community from acquiring infection.

* Secondary prevention is largely the domain of clinical medicine

Early Diagnosis and treatment

WHO defined early detection as:

- The detection of disturbance of mechanism while biochemical, morphological and functional changes are still reversible. to prevent overt disease or disablement.

⇒ The criteria of diagnosis if possible:

↳ based on early biochemical, morphological, functional changes that precede the occurrence of sign and symptoms.

↳ This is of particular importance in chronic disease.

⇒ Early detection (Screening) and treatment are the main interventions of disease control.

but they are not as effective and economical as Primary Prevention

- ⇒ The Earlier the diagnosis
 - ↳ the better treated
 - ↳ the better diagnosis
 - ↳ the better preventing of secondary cases or any long term disability.

- ⇒ Early effective therapy
 - ↳ shorten period of communicability.
 - ↳ reduce the mortality from acute communicable diseases.

note early diagnosis and therapy are critically important in reducing mortality and morbidity in certain disease (ex) - essential hypertension - breast cancer - cancer cervix

* The draw back (impairment) of 2nd prevention:

- ① The Patient are already been subject to mental distress, physical pain, and the community loss of productivity.
- ② these situation are not happen in 1st prevention.
- ③ it imperfect tool in the control of transmission of disease.
- ④ more expensive and less effective than 1st prevention.

④ Tertiary Prevention

⑤ Disability limitation

when the disease process advanced beyond its early stage ↵

• when the patient report late in pathogenesis phase the mode of intervention is tertiary.

* The objective : aim to prevent the transition of the disease Process from impairment to handicap.

Tertiary Prevention is : All measure available to reduce or limit impairment and disabilities, minimize suffering caused by this health problem.

↳ aim to :

- limit impairment and disability
- decrease suffering
- promote the patient adjustment to rehabilitation.

⑥ Rehabilitation : The combined and coordinate use of medical, social, educational and vocational measures for training and retraining the individual to the highest level of functional ability.

⇨ Aim to : ① reducing the impact of disabling and handicapping condition

② enable the disabled and handicapped to achieve social integration.

● it includes all measures:

- ① Medical rehabilitation → restoration of function
 - ② Vocational → restoration of capacity to earn a livelihood.
 - ③ Social → restoration of family and social relationship.
 - ④ Psychological → restoration of personal dignity and confidence.
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* sequence of events that leading to disability:

Disease → impairment → Disability → Handicap

① impairment : any loss or abnormality of psychological, physiological anatomical structure or function.

ex: loss of food - defective vision - mental retardation

→ the impairment may be → visible or invisible,

- ↳ temporary or permanent,
- ↳ progressive or regressive.

② Disability : because of an impairment, the affected person be unable to do activities normal for his: (age, sex, ...)

↳ Any restriction or lack of ability to perform an activity within the range considered normal for a human.

③ Handicap = disadvantage for a given individual resulting from impairment or disability that limits or prevent fulfilment of a role that is normal in his (age, sex, social and cultural factor)

* Example of rehabilitation

- special school for blind pupils
- Provision of aids for crippled (paralytic)
- reconstruction surgery
- modification of life of cardiac Patient.