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(1)

Discuss Immunization

Immunization is the process of protecting an individual from an infectious disease by stimulating the body's immune system to produce protective antibodies and memory cells. It helps the body recognize and fight pathogens (such as bacteria and viruses) if exposed in the future.

Types of Immunization

1. Active Immunization

This occurs when the body produces its own antibodies after exposure to an antigen.

Forms of Active Immunization

- Natural active – occurs after natural infection (e.g., a person recovers from measles and becomes immune).
- Artificial active – achieved through vaccination (e.g., measles, tetanus, hepatitis B vaccines).

Characteristics

- Long-lasting protection
- Develops slowly
- Produces immunological memory

2. Passive Immunization

This occurs when a person receives ready-made antibodies from another source.

Forms of Passive Immunization

- Natural passive – maternal antibodies passed through the placenta or breast milk.
- Artificial passive – injection of immune serum or immunoglobulins (e.g., anti-rabies immunoglobulin, tetanus immunoglobulin).

Characteristics

- Provides immediate protection
- Short-term
- No memory formation

Importance of Immunization

1. Prevents infectious diseases such as measles, polio, diphtheria, tetanus, hepatitis B, and tuberculosis.
2. Reduces morbidity and mortality, especially among children.
3. Prevents outbreaks and epidemics by increasing community immunity.
4. Eradicates or eliminates diseases (e.g., smallpox eradicated; polio nearly eradicated).
5. Reduces healthcare costs by preventing illness.
6. Protects vulnerable populations, such as newborns, elderly, and immunocompromised people.

How Immunization Works (Mechanism)

1. A vaccine containing weakened, killed, or parts of pathogens is introduced into the body.
2. The immune system recognizes the antigen as foreign.
3. The body produces antibodies and memory cells.

4. On future exposure to the same pathogen, the immune system responds faster and stronger, preventing disease.

Types of Vaccines Used in Immunization

- Live attenuated vaccines (e.g., measles, polio OPV, yellow fever)
- Inactivated/killed vaccines (e.g., hepatitis A, cholera)
- Toxoid vaccines (e.g., tetanus, diphtheria)
- Subunit and conjugate vaccines (e.g., Hib, pneumococcal)
- mRNA vaccines (e.g., COVID-19 mRNA vaccines)

mExamples of Immunization Programs

Most countries implement routine immunization schedules, usually including:

- BCG
- OPV
- DPT (or pentavalent)
- Hepatitis B
- Measles/MR vaccine
- Yellow fever
- HPV (for adolescents)

Herd Immunity

When a large proportion of the population is immunized, it reduces the spread of disease, protecting even unvaccinated individuals.

(2)

Discuss Prevention

Prevention refers to all the measures taken to avoid the occurrence of disease, reduce its impact, or stop its progression. It involves actions designed to protect health before a disease develops, detect problems early, or limit complications after a disease occurs.

Prevention is a key principle in public health, aiming to keep individuals and communities healthy by addressing risk factors, promoting healthy behavior, and reducing exposure to hazards.

Goals of Prevention

1. Reduce the occurrence of diseases
2. Promote and maintain health
3. Avoid disability and complications
4. Decrease healthcare costs
5. Improve quality of life

Three Levels of Prevention

1. Primary Prevention

Aims to prevent the onset of disease before it occurs.

Examples

- Immunization
- Health education (e.g., safe sex, healthy diet)
- Sanitation and clean water
- Use of insecticide-treated nets
- Avoiding smoking

Key idea: Stop disease before it happens.

2. Secondary Prevention

Aims to detect disease early and start treatment immediately to stop progression and prevent complications.

Examples

- Screening tests (BP check, HIV testing, Pap smear)
- Early diagnosis and prompt treatment
- Self-breast examination

Key idea: Catch disease early and limit damage.

3. Tertiary Prevention

Aims to reduce disability, improve function, and prevent complications in people who already have disease.

Examples

- Rehabilitation (physical therapy after stroke)
- Control of chronic diseases (diabetes, hypertension)
- Support groups and counselling
- Training to help disabled individuals adapt

Key idea: Manage disease to improve quality of life.

Importance of Prevention

- Saves lives
- Reduces disease transmission
- Lowers healthcare costs
- Protects vulnerable populations
- Improves community health and productivity