**Unit V Pharmaceutics 1st**

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**Topic: Immunological Product**

**Immunology** is the study of the immune system. The immune system is a host defence system comprising many biological structures and processes within an organism that protects us from infection and disease causes bacteria. If the immune system is not functioning, it can result in disease, such as autoimmunity, allergy and cancer.

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine.

**Active Immunization** Stimulates the host’s immune system to produce specific antibodies or cellular immune responses or both which would protect against or eliminate a disease.

**VACCINE:** Vaccine is an antigenic substance prepared from the causative agent of a disease or a synthetic substitute, used to provide immunity against one or several diseases. It contains dead bacteria or weak bacteria or toxins. Vaccine stimulates the body to make antioxidants.

Vaccines are preparations of antigenic materials, which are administered with the objective of inducing in the recipient specific and active immunity against infectious microorganisms or toxins produced by them. They contain living or killed microorganisms, bacterial toxoids or antigenic material from the particular parts of bacterium, rickettsia, or virus.

**Types of Vaccines Active Immunization**

- Live attenuated vaccines Eg. Measles, Mumps, Rubella, Rotavirus, Tuberculosis (BCG)
- Inactivated or killed vaccines Eg. Hepatitis A, Some influenza vaccines
- Toxoids eg Diphtheria, tetanus
- Cellular fractions
- Immunoglobulins
- Antisera

**Toxoid vaccines:** In some bacterial infections (Eg., diphtheria, tetanus), the clinical manifestations of disease are caused not by the bacteria themselves but by the toxins they secrete. Toxoid vaccines are produced by harvesting a toxin
and altering it chemically (usually with formaldehyde) to convert the toxin to a toxoid. The toxoid is then purified. Toxoid vaccines induce antibodies that neutralise the harmful exotoxins released from these bacteria.

Toxoids are inactivated toxins, are vaccines directed at the toxins produced by a pathogen. The tetanus and diphtheria toxoids have long been part of the standard childhood immunization series. They require a series of injections for full immunity, followed by boosters every 10 years.

**SERA:** The clear, pale yellow liquid that separates from the clot in the coagulation of blood. Sera does not contain bacteria or toxins. It contains anti formed in another animal. Sera acquired immune immediately and remain a short time. specific animal by immunization, whole blood collected in, but the serum is a nonspecific mixture obtained after centrifugation.

**Antotoxic SERA**

Sera may be Anti-toxic, Anti-viral, Anti-bacterial. Anti-toxic sera more effective than Anti-viral, Anti-bacterial.

Example 1. DIPHTHERIA ANTITOXIN It is sterile, nonpyrogenic solution containing specific antitoxic antibody from healthy horse. They neutralize the toxin produce by C-diphtheriae Preparation.

(c diphtheriae is Corynebacterium diphtheriae, a pathogenic bacterium that causes diphtheria).

Example 2. TETANUS ANTITOXIN: It containing specific antitoxic antibody which neutralize the toxin produce by C-Tetani. Method of preparation, storage and dose similar to diphtheria antitoxin.

**OTHER DIAGNOSTIC PREPARATION**

They are the antigen used as in-vivo diagnostics, when injected intradermally into the patients. They are based upon hypersensitivity reactions and shows sensitivity to antigen in presence of antibody.

a) **The Schick Test:** When a dose of toxin is injected intracutaneously and if the patient is immune, the presence of antibody will neutralise the toxin and if antitoxin is absent, the toxin produces local inflammation (to identify diphtheria).

b) **Tuberculum test toxin:** It is a protein of mycobacterium tuberculosis, which stimulates tissue to produce corresponding antibodies, which reacts with the
antigen when injected as a test dose, causing inflammation and necrosis. **It is used in the diagnosis of tubercle infection.** Injection is done into the skin. **After 48 to 72 hours if there is more than a five to ten millimeter area of swelling the test is considered positive** and when a person is not actually suffering from the disease there will be no inflammation.

**The Mantoux test:** Most precise method. In this test very small dose (1 unit) of antigens is injected SC in volume of 0.1 ml initially. Mantoux test is a tool for screening for tuberculosis (TB). The test is "positive" if there is a bump of a certain size where the fluid was injected. This means you probably have TB germs in your body. The skin test reaction should be read between 48 and 72 hours after administration. **The reaction should be measured in millimeters of the induration** (palpable, raised, hardened area or swelling).

**Allergenic extract:** They are solution or suspension of allergens used for diagnosis and treatment of allergic disease eg. Therapeutic extract, Intradermal test extract, Diagnostic mixture. **Types of allergic extract are fungal, insect, dust, food and pollen extract** Prepare by same as like parenteral products.

ASSIGNMENT (UNIT 5TH)
Q.1 What is immunology?
Q.2 Define Vaccine
Q.3 What are Sera?
Q.4 Short note on Toxoid vaccines
Q.5 Explain about other diagnostic preparation in immunology

*(Highlight Text have important points. Take a Print of the Document and Submit Hand written Assignment whenever ask)*

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