IMMUNOSTIMULANTS

- Levamisole
- Thalidomide
- BCG
- Recombinant Cytokines
  - ➢ Interferons
  - ➢ Interleukin-2

Immunization

- Vaccines
- Immune Globulin
- Rho (D) Immune - Globulin

TETRAMISOLE (LEVAMISOLE)

- Levamisole is orally active levo isomer of tetramisole, restores depressed T-cell function

- Used as an adjunct in malignancies, aphthous ulcers & recurrent herpes, also used as disease modifying drug in Rheumatoid Arthritis

- Mainly acts by raising c-GMP levels through interaction with thymopoietin receptor sites

- Leads to decrease in metabolic inactivation of c-GMP accompanied with increased breakdown of c-AMP.

- Increase in c-GMP level induces lymphocyte proliferation & augmentation of chemotactic responses.

- This reflects into increased antibody production, lymphokine production, increased phagocytosis.

Thalidomide

- Anxiolytic, antiemetic drug with anti-inflammatory, cytokine modulatory activity
- Enhanced T-cell production of cytokines – IL-2, IFN-γ
- NK cell-mediated cytotoxicity against tumor cells
- USE:

➢ Multiple myeloma, ENL

Bacillus Calmate Guerin(BCG) Vaccine

- It is used as immunological enhancer to stimulate intact immune system (i.e. a non-specific immuno-enhancer.) of the body.
- BCG & its methanol extracted residue (MER) contain muramyl dipeptide as an active immunostimulant ingredient
- T-lymphocytes are principle target cells for the action of BCG vaccine.
- It causes stimulation of macrophage function, phagocytic activity, lysosomal enzyme activity & chemotaxis mechanisms
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Bacillus Calmate Guerin(BCG) Vaccine

- It induces the production of lymphocyte-activity factor resulting of phase I of immune response.

- Because of its activity against tumor antigen it is beneficial in treatment of lung & breast cancer, acute lymphocytic & myelogenous leukemia.

- It is available as un-lyophilized, live or killed lyophilized form.

Interferons

- Low molecular weight glycoprotein cytokines produced by host cells in response to viral infections
- Immunomodulatory activity
- Bind to cell surface receptors – initiate intracellular events

➢ Enzyme induction

➢ Inhibition of cell proliferation

➢ Affect viral replication

➢ Increased Phagocytosis

Interferon alfa-2b

- Hairy cell leukemia
- Malignant melanoma
- Kaposi sarcoma
- Chronic Hepatitis B
- Adverse reactions

➢ Flu-like symptoms – fever, malaise, headache

➢ CVS- hypotension, Arrhythmia

➢ CNS- depression, altered behavior

Interleukin-2 (aldesleukin)

- Proliferation of cellular immunity – Lymphocytosis, eosinophilia, release of multiple cytokines – TNF, IL-1, IFN-γ
- Promotes differentiation of T-cells
- Uses
  - ➢ Metastatic renal cell carcinoma
  - ➢ Malignant Melanoma
- Toxicity
  - ➢ Flu- like symptoms- fever, headache, fatigue
  - ➢ Hypotension, drowsiness, confusion, loss of appetite

Immunization

- Active – Stimulation with an Antigen
- Passive – Preformed antibody

Active immunization

VACCINES

- Impart active immunity.
- Active immunization more efficacious & longer lasting than passive immunization.
- Booster doses required at certain intervals.
- Anticancer vaccines – immunizing patients with APCs. expressing tumor antigen.

Passive immunity (Immune Globulin)

Indications

- Individual is deficient in antibodies – immunodeficiency
- Individual is exposed to an agent, inadequate time for active immunization

➢Rabies

➢Hepatitis B

- Nonspecific immunoglobulins
  - ➢ Antibody-deficiency disorders
- Specific immune globulins
  - ➢ High titers of desired antibody
  - ➢ Hepatitis B, Rabies, Tetanus

Rho (D) Immune Globulin

- Antibodies against Rh(D) antigen on the surface of RBC
- Binds the Rho antigens & does not allow them to induce antibody formation in Rh –ve individuals
- Used for prevention of postpartum/post-abortion formation of antibodies in Rho-D –ve women (Hemolytic disease of newborn)
- Given at 28th week of pregnancy

THANKS