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Diploma in Pharmacy 1st Year
Pharmaceutical Chemistry
Important Questions
Chapter 13 : Anti-Neoplastic Agents

Chapter 13
Anti-Neoplastic Agents
IMPORTANT Questions

Q1. What are the Antineoplastic Agent example Cyclophosphamide,

Ans.

→ Cancer is a disease characterised by abnormal and uncontrolled cell division attacking the surrounding tissues and organs, and also the distant body parts by circulating with blood and lymph.

Cancer is classified into the following categories

1) Carcinoma: This type of cancer starts in the skin or tissues lining the internal organs. There are many sub types of carcinoma, like adenocarcinoma, basal cell carcinoma, squamous cell carcinoma, and transitional cell carcinoma.
2) Sarcoma: This type of cancer starts in the bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissues.
3) Leukaemia: This type of cancer starts in the blood forming tissues (i.e., the bone marrow) and produces numerous abnormal blood cells.
4) Lymphoma and Myeloma: This type of cancer starts in the cells of immune system.
5) Central Nervous System Cancers: This type of cancer starts in the brain and spinal cord tissues.

Antineoplastic or anticancer drugs are used for treating malignancies or cancerous growths. Either these drugs are used alone (chemotherapy) or in combination with surgery or radiation therapy.) Examples

The following alkylating agents are discussed

1. Cyclophosphamide,
2. Busulfan,
3. Mercaptopurine,
4. Fluorouracil,
5. Methotrexate,
6. Dactinomycin,
7. Doxorubicin hydrochloride,
8. Vinblastine sulphate,
9. Cisplatin, and
10. Dromostanolone propionate.

Cyclophosphamide

→ Cyclophosphamide is a precursor of alkylating nitrogen mustard antineoplastic and immunosuppressive agent. It activates in the aldophosphamide.) liver to form the active

Mechanism of Action

- Cyclophosphamide is a cell cycle-non-specific cytotoxic agent. It acts against the cells that are actively dividing and resting before entering the cell cycle. The hepatic cytochrome P-450 enzyme system activates cyclophosphamide to make it cytotoxic. It alkylates DNA and forms cross-links between DNA strands. These cross links interfere with DNA replication and transcription, thus cell proliferation is inhibited ultimately resulting in cell death. The activity of cyclophosphamide is maximum when a cell is replicating its DNA. This is because at this stage the unpairing of DNA strands makes the nucleotide residues more susceptible to alkylation.

Uses

1. It is used in the treatment of malignant lymphomas, multiple myeloma, leukaemia, mycosis fungoides, neuroblastoma, adenocarcinoma of the ovary, retinoblastoma, and carcinoma of breast.
2. It is also used in biopsy-proven minimal change nephrotic syndrome in paediatrics.

Stability and Storage Conditions

- These preparations should be refrigerated in glass containers for up to 14 days before using.

Types of Formulations

1. Injection
2. Powder for solution

Popular Brand Name

I. Procytox