

The Impact of Cancer Drugs on Quality of Life

Farhad Mohammad*

Department of Chemistry, University of Payame Noor, Sirjan, Iran

DESCRIPTION

Cancer, a formidable adversary, continues to challenge medical science despite significant advancements. The development of anti-cancer drugs has been pivotal in the fight against this disease, offering hope and improved survival rates for millions of patients. The study shows into the various types of anti-cancer drugs, their mechanisms, uses, side effects and the future of cancer treatment. Anti-cancer drugs, also known as anticancer agents or chemotherapy drugs, are medications designed to treat cancer by inhibiting the growth and spread of malignant cells. These drugs can be used alone or in combination with other treatments such as surgery, radiation therapy and immunotherapy.

Types of anti-cancer drugs

Anti-cancer drugs are categorized based on their chemical nature and mechanism of action. Here are the main types:

Alkylating agents: Alkylating agents work by adding an alkyl group to the Deoxyribo nucleic Acid (DNA) of cancer cells, which prevents them from replicating. This type of drug is effective against a broad range of cancers but can also affect rapidly dividing normal cells, leading to side effects.

Antimetabolites: Antimetabolites resemble the building blocks of DNA and Ribonucleic acid (RNA). When cancer cells incorporate these drugs into their genetic material during replication, it leads to cell death.

Antitumor antibiotics: Despite their name, antitumor antibiotics are not used to treat infections. They work by interfering with the DNA inside cancer cells, preventing them from growing and dividing.

Plant alkaloids: Derived from plants, these drugs disrupt the process of cell division (mitosis), leading to cell death. They are particularly effective against certain types of leukemia and lymphomas.

Topoisomerase inhibitors: These drugs target the enzymes topoisomerase I and II, which help manage DNA structure

during replication. By inhibiting these enzymes, the drugs prevent DNA replication and transcription in cancer cells.

Platinum-based drugs: Platinum-based drugs cause cross-linking of DNA strands, which prevents cancer cells from dividing and leads to their death. They are commonly used in the treatment of solid tumors.

Hormonal agents: Some cancers, such as breast and prostate cancer, are driven by hormones. Hormonal agents work by blocking the body's natural hormones that fuel cancer growth.

Targeted therapy: Targeted therapies focus on specific molecules involved in cancer growth and progression. These drugs are designed to target cancer cells while sparing normal cells, reducing side effects.

Immunotherapy: It includes a variety of approaches, such as checkpoint inhibitors, CAR T-cell therapy and cancer vaccines.

Mechanisms of action

Anti-cancer drugs employ various mechanisms to target and destroy cancer cells:

DNA damage: Many anticancer drugs cause direct damage to the DNA of cancer cells, preventing them from replicating and causing cell death.

Inhibition of cell division: Drugs like plant alkaloids and topoisomerase inhibitors disrupt the mitotic process, leading to cell death.

Hormonal modulation: Hormonal agents block or lower the levels of hormones that certain cancers need to grow.

Immune system activation: Immunotherapies enhance or mimic the body's natural immune response to target and destroy cancer cells.

Uses of anti-cancer drugs

Anti-cancer drugs are used in various clinical settings:

Curative treatment: In some cases, chemotherapy can eliminate cancer, especially when combined with surgery or radiation.

Correspondence to: Farhad Mohammad, Department of Chemistry, University of Payame Noor, Sirjan, Iran, Email: xiao.tao@sirjan.ac.ir

Received: 13-May-2024, Manuscript No. CMT-24-32163; **Editor assigned:** 16-May-2024, Pre QC No. CMT-24-32163 (PQ); **Reviewed:** 30-May-2024, QC No. CMT-24-32163; **Revised:** 06-Jun-2024, Manuscript No. CMT-24-32163(R); **Published:** 13-Jun-2024, DOI: 10.35248/2167-7700.24.12.216

Citation: Mohammad F (2024) The Impact of Cancer Drugs on Quality of Life. Chemo Open Access. 12:216

Copyright: © 2024 Mohammad F. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Adjuvant therapy: After primary treatments like surgery, chemotherapy can help eliminate residual cancer cells and reduce recurrence risk.

Neo adjuvant therapy: Before surgery, chemotherapy can shrink tumors, making them easier to remove.

Palliative care: For advanced cancer, chemotherapy can relieve symptoms, improve quality of life and prolong survival.

Side effects

Anti-cancer drugs often come with significant side effects due to their impact on normal, rapidly dividing cells:

Nausea and vomiting: Commonly managed with antiemetics.

Hair loss (Alopecia): A temporary but distressing side effect.

Fatigue: A frequent issue that can affect daily life.

Myelosuppression: Reduced bone marrow activity, leading to anemia, neutropenia and thrombocytopenia.

Peripheral neuropathy: Nerve damage causing tingling, numbness or pain in the extremities.

Immunosuppression: Increased risk of infections due to a weakened immune system.

CONCLUSION

Anti-cancer drugs have revolutionized cancer treatment, offering hope and extended survival for many patients. While they come with challenges, including significant side effects, ongoing study and technological advancements promise more effective and personalized therapies. Understanding the various types of anti-cancer drugs, their mechanisms and uses is important for patients, caregivers and healthcare providers in navigating the complex view of cancer treatment.