

Chemotherapy: An Overview

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COMMENTARY

Chemotherapy (abbreviated as chemo, CTX, or CTx) is a cancer treatment that involves the administration of one or more anti-cancer medications (chemotherapeutic agents) as part of a standardised chemotherapy protocol. Chemotherapy can be given with the goal of curing cancer (which nearly often involves a combination of medications), or it can be given with the goal of extending life or reducing symptoms (palliative chemotherapy). Chemotherapy is one of the key categories of medical oncology, which is the branch of medicine dedicated to cancer pharmacotherapy. Chemotherapy has come to mean the use of non-specific intracellular poisons to impede mitosis (cell division) or produce DNA damage, which is why DNA repair inhibition can be used in conjunction with chemotherapy. Chemotherapy's connotation precludes more selective medicines that disrupt extracellular signals (signal transduction). Hormonal therapies are medications that suppress growth-promoting signals from conventional endocrine hormones (mainly estrogens for breast cancer and androgens for prostate cancer) by targeting specific molecular or genetic targets. Targeted therapy refers to various inhibitions of growth signals, such as those related with receptor tyrosine kinases. Importantly, medications (whether chemotherapy, hormonal therapy, or targeted therapy) are considered systemic cancer therapy because they are injected into the bloodstream and so have the potential to treat cancer in any anatomic region in the body. Systemic therapy is frequently used in conjunction with other cancer therapies that are classified as local therapy (i.e., treatments whose efficacy is limited to the anatomic area in which they are administered), such as radiation therapy, surgery, or hyperthermia therapy.

Traditional chemotherapeutic drugs are deadly by interfering with cell division (mitosis), however the susceptibility of cancer cells to these agents varies greatly. Chemotherapy can be viewed of as a method of damaging or stressing cells, which can lead to cell death if apoptosis is triggered. Damage to normal cells that divide fast and are thus sensitive to anti-mitotic drugs: cells in the bone marrow, digestive system, and hair follicles, are responsible for many of the side effects of chemotherapy. The most common adverse effects of chemotherapy include myelosuppression (lower production of blood cells, resulting in immunosuppression), mucositis (inflammation of the digestive tract lining), and alopecia (hair loss) (hair loss).

Chemotherapy medications are frequently used in a variety of disorders caused by detrimental immune system overactivity towards self-due to their influence on immune cells (particularly lymphocytes) (so-called autoimmunity). Rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis, vasculitis, and other autoimmune diseases are among them.

Methods of treatment

Chemotherapeutic medicines are being administered via a variety of ways. Chemotherapy may be administered with the goal of curing cancer, prolonging life, or alleviating symptoms.

- **Induction chemotherapy:** It is a chemotherapeutic medication used as the first line of treatment for cancer. This sort of chemotherapy is used for the purpose of curing cancer.
- **Combined modality chemotherapy:** The use of medications in conjunction with other cancer treatments such as surgery, radiation therapy, or hyperthermia therapy is known as combined modality chemotherapy.
- **Consolidation chemotherapy:** This is given after remission in order to prolong the overall disease-free time and improve overall survival. The drug that is administered is the same as the drug that achieved remission.
- **Intensification chemotherapy:** It is similar to consolidation chemotherapy, except it is administered with a different medication than induction chemotherapy.
- **Combination chemotherapy:** Entails administering a number of different medications at the same time to a patient. The mechanisms and adverse effects of the medications differ. The major benefit is that it reduces the risks of acquiring resistance to any one treatment. Furthermore, the medications can frequently be administered at lower doses, which reduce toxicity.
- **Neoadjuvant chemotherapy:** It is a type of chemotherapy that is given before a local treatment like surgery in order to reduce the original tumour. It's also used to treat tumours that have a high chance of developing micrometastatic illness

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