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Strategies, Adverse Effects and Limitations of Chemotherapy

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Perspective

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DESCRIPTION

Chemotherapy is a type of cancer treatment that involves the use of one or more anti-cancer medications (chemotherapeutic agents or alkylating agents) as part of a prescribed chemotherapy regimen. Chemotherapy is sometimes shortened as "chemo" and occasionally CTX or CTx. Chemotherapy may be administered with the intention of curing (which usually always requires drug combinations), extending life, or reducing symptoms (palliative chemotherapy). One of the main subspecialties of the medical field known as medical oncology, which is dedicated to pharmacotherapy for cancer, is chemotherapy.

Inhibition of DNA repair can complement chemotherapy since the term "chemotherapy" has evolved to refer to the non-specific use of intracellular toxins to prevent mitosis (cell division) or cause DNA damage. More specialized drugs that block extracellular signals are not included by the phrase chemotherapy's connotation (signal transduction). The term "Targeted therapy" is used to describe various growth-signal inhibitions, such as those linked to receptor tyrosine kinases.

Psychiatrists depending on the kind of medication employed, chemotherapeutic methods might have a variety of adverse effects. The majority of drugs primarily impact the body's rapidly dividing cells, like blood cells and the cells lining the mouth, stomach, and intestines. In many cases, both in human and animal tests, short-term fasting in the days of medication increased tolerability/reduced side effects, and enhanced therapeutic success. The type of cancer and the stage affect how effective chemotherapy is. Overall effectiveness varies from curative for some diseases, like brain tumors, non-melanoma skin cancers.

Enterocolitis neutropenic

Neutropenic enterocolitis (typhlitis) a "life-threatening gastrointestinal consequence of chemotherapy," is brought on by immune system suppression. Typhlitis is an intestine infection that can cause symptoms like nausea, vomiting, diarrhoea, a bloated stomach, a fever, chills, or tenderness and discomfort in the belly. Typhlitis is a serious medical condition. It frequently results in death if not properly diagnosed.

Intestinal discomfort

Chemotherapeutic drugs that stop rapidly dividing cells frequently cause side effects include nausea, vomiting, anorexia, diarrhoea, stomach cramps, and constipation. When the receiver does not consume enough food or liquids, or when they frequently throw up due to gastrointestinal injury, malnutrition and dehydration may develop. If the person consumes too much in an effort to get rid of their nausea or heartburn, this could lead to rapid weight loss or, on rare occasions, weight gain. Some steroid drugs can also make you gain weight.

Nausea and diarrhoea

Vomiting and nausea caused by chemotherapy. For cancer patients and their families, nausea and vomiting are two of the adverse effects of cancer treatment that are most feared. People taking chemotherapy classified nausea and vomiting as the primary and second most severe side effects, respectively. With various treatments and some cancer types, Chemotherapy-Induced Nausea and Vomiting (CINV) is a common side effect.

Cognitive dysfunction

Some chemotherapy patients experience exhaustion or generalized neurocognitive issues, like difficulty focusing; this is commonly referred to as post-chemotherapy cognitive impairment and is known as "chemo brain" in popular and social media. Chemotherapy is not always effective, and even when it is, the cancer may not always be entirely eradicated. Frequently, people are unaware of its restrictions. More than two-thirds of those with lung cancer and more than four-fifths of those with colorectal cancer in one research of persons with stage 4 cancer who had just received a new diagnosis still believed that chemotherapy would certainly cure their disease.

Chemotherapy cannot reach the brain because of the blood-brain barrier. This is so that the brain may be protected from hazardous chemicals *via* a sophisticated system. Drug transporters can dispense medications into the cerebrospinal fluid and blood circulation from the brain and blood vessel cells in the brain. The majority of chemotherapy medications are pumped out by these transporters, which lowers their effectiveness for treating brain cancers. The blood-brain barrier can only be crossed by tiny lipophilic alkylating drugs like lomustine or temozolomide. Tumor blood arteries differ significantly from those found in healthy tissues. The tumour cells that are farthest from the blood vessels lose oxygen as it grows (hypoxic). They then signal for new blood vessels to form in order to combat this. The freshly generated tumour vasculature is inadequately developed and does not adequately feed blood to the entire tumour. Due to the fact that the circulatory system will supply a large number of medications to the tumour, this creates problems with drug delivery.