# Review Article: Complications of Chemotherapy Drugs in the Process of Cancer Treatment: A Review Study

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## ABSTRACT

**Introduction:** Chemotherapy is one of the most effective treatments for all types of cancer. But like other treatments, it often causes side effects. Using strong chemical drugs to stop the growth of cancer cells can also affect healthy cells and cause problems for the patient. Some side effects are short-lived and others may have long-term effects. The side effects of chemotherapy can be different for each person and it depends on the type of cancer, its location, drugs and their dosage, and the general health status of the patient. **Methods:** In total, 35 articles with a time limit of the last 5 years were obtained by deleting 9 articles whose full text Not available; finally, 26 articles were included in the study. **Results:** The side effects that chemotherapy drugs may cause in the body depend on the drug composition and the severity of the body's reaction to the drug. The side effects of chemotherapy drugs are temporary and transient, and the patient does not suffer from all side effects. Therefore, mentioning the complications is only for the purpose of knowing them better and knowing the appropriate solution to deal with it. **Conclusion:** Many side effects of chemotherapy can be minimized by timely diagnosis, correct adjustment of drug dosage and preventive measures. It is also necessary to improve the level of awareness of the patient and his family regarding the complications caused by the need for chemotherapy in order to help manage the complications.

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## Introduction

Today's, with the advancement of medical facilities and knowledge, the population of elderly people has increased. On the other hand, the use of tobacco and alcohol consumption, the change of human life pattern and the aggravation of environmental polluting factors have caused cancer to be considered as one of the common diseases [1]. According to studies, cancer is responsible for 13% of people's deaths in the world and it is said that 70% of deaths caused by cancer unfortunately occur in developing countries [2].

For many years, cancer has harmed many people and is the second leading cause of death worldwide after cardiovascular diseases [3]. Cancer is a very complex genetic, epigenetic and environmental disease and has great diversity in tissue, tumor and cellular levels. Diversity can lead to inappropriate treatments [4]. Currently, we are witnessing the emergence of codified and comprehensive treatment recipes as well as new drugs in the field of controlling or eradicating malignancy[5]. But due to the complex nature of the disease and the range of effects and potential side effects of the drugs used, it is necessary to follow up the patient and have proper knowledge of the treatment process and how to deal with possible side effects. Optimal effectiveness is required [6].

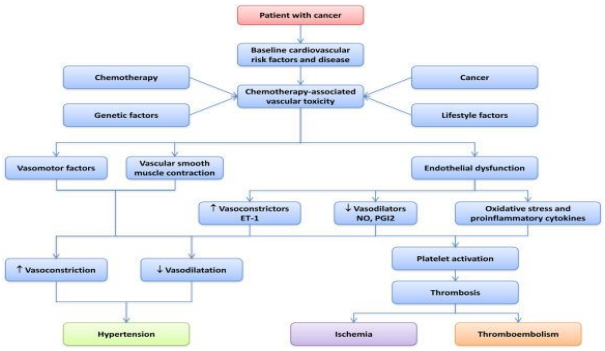


**Figure1.** Pathology of Cancer

Chemotherapy is one of the most effective treatments for all types of cancer. But like other treatments, it often causes side effects. Using strong chemical drugs to stop the growth of cancer cells can also affect healthy cells and cause problems for the patient [7]. Some side effects are short-lived and others may have long-term effects. The side effects of chemotherapy can be different for each person and it depends on the type of cancer, its location, drugs and their dosage, and the general health status of the patient [8].

Chemotherapy drugs work by targeting cells that reproduce quickly, which is a characteristic of cancer cells. As cells stop dividing, tumor cells shrink and disappear. Most chemotherapy drugs circulate throughout the body in the same way that they circulate the metastasized cancer cells in a systematic way and through the blood stream [9]. Unfortunately, these drugs cannot distinguish between normal body cells that grow fast and cancer cells. As a result, these drugs destroy and damage fast-growing body cells such as bone marrow, digestive system, and hair follicles [10].

Chemotherapy works on active cells. Active cells are cells that are growing and dividing into more similar cells. Cancer cells are active, but some healthy cells are also active. Side effects occur when chemotherapy damages these healthy cells [11]. Some chemotherapy drugs can damage the cells of the heart, kidneys, bladder, lungs, and nervous system. Sometimes you can use drugs with chemotherapy to protect your body's normal cells. Also, there are ways to relieve side effects [12].

Today, there are more drugs for the side effects of chemotherapy than ever before. Preventing and treating side effects, called palliative care or supportive care, is an important part of cancer treatment [13]. Not everyone gets side effects from chemotherapy and only some people may experience these problems. Different drugs have different side effects. The severity of side effects varies from person to person. This study was conducted to control the side effects of chemotherapy drugs [14].

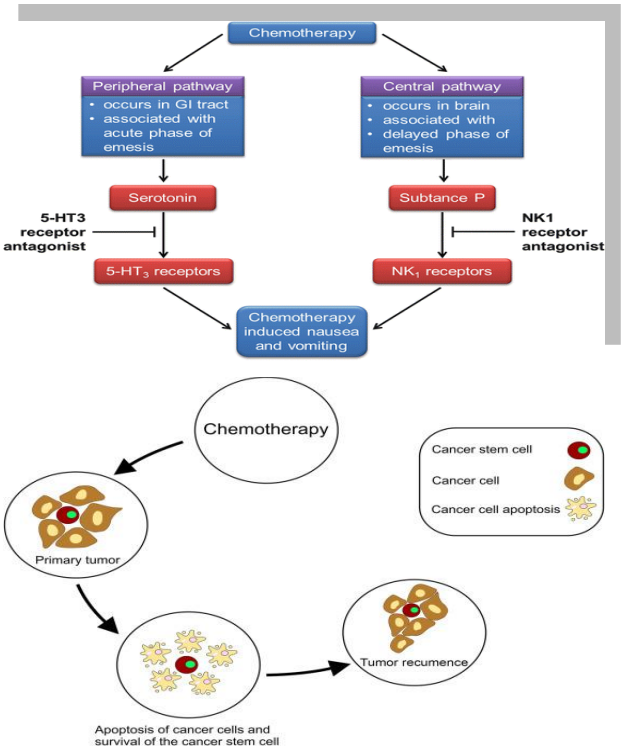


**Figure 2.** Chemotherapy Process

## Methods

This review study by searching the databases of Google Scholar, SID, Scopus, PubMed and Web of Science, using Persian keywords Complications, Chemotherapy Drugs, Cancer Treatment. Their English was done. In total, 35 articles with a time limit of the last 5 years were obtained by deleting 9 articles whose full text Not available; finally, 26 articles were included in the study

## Results

The side effects that chemotherapy drugs may cause in the body depend on the drug composition and the severity of the body's reaction to the drug. The side effects of chemotherapy drugs are temporary and transient, and the patient does not suffer from all side effects. Therefore, mentioning the complications is only for the purpose of knowing them better and knowing the appropriate solution to deal with it [15].

In the study Yu WD et al, the findings showed that the most common side effect of chemotherapy is nausea and vomiting. Nausea and vomiting caused by these drugs are not the same and their occurrence is not the same in different people. In order to prevent this condition, oral or other injectable drugs are usually used before chemotherapy [16].

In the study Schirrmacher et al, the results showed that some drugs cause severe nausea and vomiting, while some cause mild nausea and vomiting. In cases where this complication is severe, these preventive drugs are also prescribed after chemotherapy [17].

The results of the study Moon et al showed that hair loss is seen in most of the people undergoing chemotherapy. Hair loss caused by chemotherapy drugs in breast cancer usually begins 2 to 4 weeks after the start of treatment and usually continues until the end of chemotherapy. Hair loss is more common after injectable chemotherapy drugs than with oral chemotherapy drugs [18].

The findings of the study Gupta et al showed that some drugs cause severe hair loss and some cause mild hair loss. To prevent hair loss, measures are taken, such as the use of hormonal drugs as intramuscular or subcutaneous injections at intervals of one to three months, which unfortunately are not very effective. Another method is to use a cooling cap. If the hair loss strength of the drug is high, this cooling cap may not be able to significantly prevent hair loss [19].

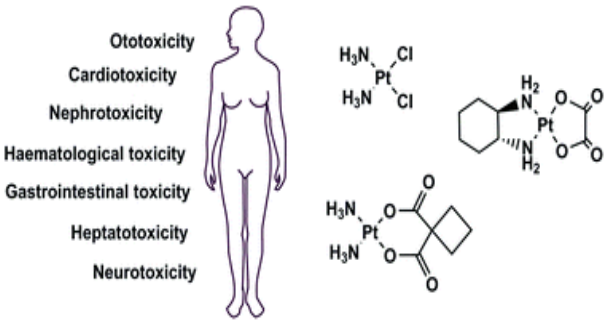


**Figure 3.** Chemotherapy Copmlications

The study Zhang showed that another complication of chemotherapy is the occurrence of oral ulcers. Oral ulcers caused by

chemotherapy can be mild to very severe, the severity of which largely depends on the type of drug used. Mouth ulcers usually occur 5 to 14 days after treatment. Wounds can become infected [20].

The results of the study Ito et al showed that a large number of patients who undergo chemotherapy experience weakness and lethargy, and it is mainly limited to the first few days after the injection and gradually resolves [21].

The studyColunga showed that patients undergoing chemotherapy suffer from blood disorders such as anemia, thrombocytopenia, and leukopenia due to bone marrow failure. Usually, the number of blood cells returns to normal after chemotherapy. But during treatment, low blood cell count can cause problems [22].

According to the study Ueno et al, some patients undergoing chemotherapy have neurological complications such as tingling, burning, weakness or numbness in the hand, foot or both muscles, weak, painful, tired or immobile, loss of balance, tremors, stiffness. Neck or headache, difficulty seeing, hearing or walking became normal [23].

The study Levi et al showed that chemotherapy drugs can affect the patient's fertility. For women, it is a problem in the ability to get pregnant and for men, it creates a problem in the ability to get a woman pregnant. Chemotherapy can also harm the fetus. This happens especially in the first trimester of pregnancy, when the organs are being completed [24].

The study Qaiser et al showed that patients undergoing chemotherapy ate less than usual, did not feel hungry at all, and felt full after eating a small amount of food. If this problem persists during treatment, they may lose weight and not get the nutrition they need. Also, they may lose muscle mass and strength [25].

The studyKhungar et al showed that chemotherapy can cause bowel problems, especially difficulty in defecation and constipation[26].

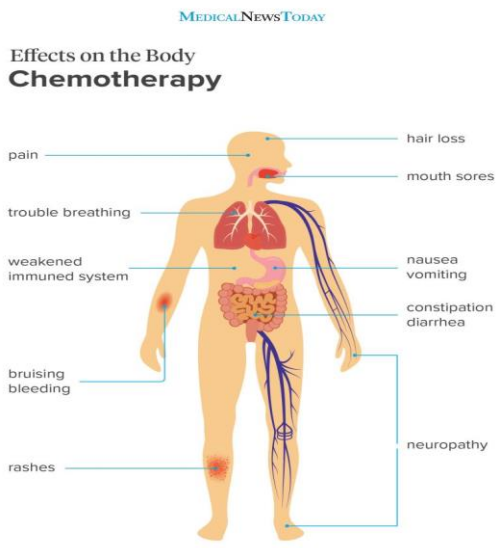


**Figure 4.** Effects of Chemotherapy

## Conclusion

The results show that a high percentage of cancer patients who undergo chemotherapy experience side effects caused by chemotherapy drugs. The severity of side effects varies from person to person. It depends on the type of cancer, its location, drugs and their dosage, and the general health status of the patient. Many side effects of chemotherapy can be minimized by timely diagnosis, correct adjustment of drug dosage and preventive measures. It is also necessary to improve the level of awareness of the patient and his family regarding the complications caused by the need for chemotherapy in order to help manage the complications.

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