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The Mechanism of Action and Clinical Application of Fasting as an Adjuvant Therapy for Cancer

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Introduction

Cancer remains one of the leading causes of death globally, with conventional therapies such as chemotherapy, radiation, and immunotherapy being the mainstays of treatment. While these therapies are often effective, they come with significant side effects and limitations, including toxicity to normal tissues, resistance to treatment, and financial burden. As a result, researchers and clinicians have sought complementary strategies to enhance treatment efficacy, reduce side effects, and improve the quality of life for patients. Fasting, the voluntary abstinence from food for a specific period, has emerged as a promising adjuvant therapy in cancer treatment. Rooted in ancient traditions and religious practices, fasting has been shown in recent years to have profound effects on cellular metabolism, stress response, and immune regulation. These effects have garnered attention for their potential to enhance the efficacy of cancer therapies while protecting normal cells from damage.This article explores the mechanisms through which fasting exerts its anticancer effects and examines its clinical applications as an adjuvant therapy for cancer. The discussion includes the biological basis of fasting, its effects on cancer cells and the tumor microenvironment, and the results of preclinical and clinical studies.

Description

Numerous animal studies have demonstrated the anticancer effects of fasting and its ability to enhance the efficacy of conventional therapies. In mouse models of various cancers, fasting alone has been shown to slow tumor growth by inducing metabolic stress and apoptosis in cancer cells. Studies have reported that fasting enhances the efficacy of chemotherapeutic agents such as doxorubicin, cisplatin, and paclitaxel. For example, in a breast cancer model, fasting increased the sensitivity of tumors to doxorubicin while reducing its cardiotoxicity.Fasting has also been shown to improve the response of tumors to radiation therapy. By inducing oxidative stress and DNA damage in cancer cells, fasting enhances the cytotoxic effects of radiation. These findings highlight the potential of fasting as a complementary strategy to improve cancer treatment outcomes.Clinical studies on fasting in cancer patients are still in their early stages, but preliminary results are promising. Different fasting protocols, such as short-term fasting (STF), intermittent fasting (IF), and fasting-mimicking diets (FMDs), have been explored in clinical settings [1,2].

STF involves fasting for 24-72 hours before and/or during chemotherapy. This approach has been shown to reduce treatment-related side effects and improve patient tolerance to chemotherapy.A pilot study in patients with various cancers reported that STF significantly reduced fatigue, nausea, and vomiting during chemotherapy.Patients undergoing STF experienced improved physical and emotional well-being, likely due to reduced systemic inflammation and oxidative stress.IF involves alternating periods of fasting and eating within a defined timeframe (e.g., 16:8 or 5:2 patterns). While most IF studies have focused on metabolic disorders, emerging evidence suggests potential benefits in cancer.IF helps prevent obesity, a major risk factor for several cancers, by promoting fat loss and improving metabolic health.In patients with prostate cancer, IF was associated with slower disease progression and improved response to androgen deprivation therapy.

Conclusion

Fasting represents a promising adjuvant therapy for cancer, with the potential to enhance treatment efficacy, reduce toxicity, and improve patient outcomes. By targeting fundamental metabolic and signaling pathways, fasting selectively sensitizes cancer cells to therapy while protecting normal cells. Although preliminary evidence is encouraging, further research is needed to overcome the challenges and limitations associated with fasting in clinical practice.With continued advancements in understanding its mechanisms and refining its application, fasting could become a valuable addition to the arsenal of cancer treatments, offering hope for improved outcomes and a better quality of life for patients worldwide.

References

1. Weng, Mei-lin, Wan-kun Chen, Xiang-yuan Chen and Hong Lu, et al. "Fasting inhibits aerobic glycolysis and proliferation in colorectal cancer via the Fdft1-mediated AKT/mTOR/HIF1α pathway suppression." *Nat Commun* 11 (2020): 1869.
2. Lessan, Nader and Tomader Ali. "Energy metabolism and intermittent fasting: The Ramadan perspective." *Nutr* 11 (2019): 1192.

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