Impact of water-only fasting on gene expression and tumor marker in breast cancer patients

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Abstract

Chemotherapy, which is one of the gold standard management for cancer, brings with it a diverse range of side effects. Cancer has been described as a metabolic disease characterized by dysfunctional mitochondria and probably this is the reason why cancer cells shifts their metabolism to a more primitive form of survival (The Warburg Hypothesis). According to this hypothesis, the cancer cells utilize glucose for aerobic glycolysis and derive building blocks for cancer cells, instead of oxidative phosphorylation to provide ATP. So, if cancer cells are not provided a glucose source, they can be starved to death, whereas the healthy cells start using ketone bodies as their fuel. Fasting for prolonged hours also induces autophagy on the healthy cells, which can reduce the side effects of chemotherapy. Limited literature is found on prolonged water-only fasting and no such studies have been reported in breast cancer. Prolonged water-only fasting has not been done in breast cancer. So, the purpose of this study was to find complementary management strategies that could reduce or eliminate the tumor and sidewise, protect the healthy cells from the toxic side effects. **Methodology**: A total of 60 breast cancer patients receiving chemotherapy were divided into 4 groups – No fasting group, Intermittent fasting group with routine diet, Intermittent fasting group with keto diet and water-only fasting group. Blood samples were taken before and after the intervention. **Findings**: The water-only fasting group showed significant increase in CD4 CD8 ratio and neutrophil lymphocyte ratio, and a significant decrease in malondialdehyde, cancer antigen 15-3, tumor necrotic factor alpha as compared to intermittent fasting with keto diet/ routine diet and the non-fasting group. Also the results were improved in the keto diet group as compared to routine diet group. **Conclusion & Significance**: Water-only fasting enhanced the anti-tumor effect of chemotherapy and improved immune surveillance leading to a better prognosis as compared to intermittent fasting with routine or keto diet. Also, all the fasting groups showed better results as compared to non-fasting group

Recent Publications

1. Khan, M. I., Bibi, Y., Ahmed, B., Haseeb, A., Khan, Y., Ullah, K., & Khan, S. (2022). Comparison of Hematological Profile Changes in Pre- and Post-Chemotherapy Treatment of Cancer Patients. *Pakistan Journal of Medical and Health Sciences*, *16*(10), 616–618. https://doi.org/10.53350/pjmhs221610616
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Bibliography

Yasmeen Bibi is a passionate teacher of Physiology teaching Physiology to medical undergraduates. Currently she is a PhD scholar in Physiology working on effects of fasting. Her MPhil research work was related to skeletal muscle contractile properties. Her research interests are related to nutrition, fasting and metabolism. She strongly believes exercise and diet modifications should be adopted as lifestyle means to reduce the incidences of cancer worldwide.

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