

Intravenous Vitamin C: A new solution to ever-growing breast cancer issue in Pakistan?

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Madam, breast cancer is a neoplastic growth of the breast tissues and is the second most common cause of cancer related female deaths worldwide. In Pakistan roughly one in every nine women suffer from breast cancer. Its risk factors include age, family history and high hormone levels. Even though, its incidence is higher in the developed world, mortality rates are overwhelming in developing regions like Pakistan.¹ Given this stressful situation, one may appreciate the beneficial effects of intravenous vitamin C on breast cancer tissues.²

Studies show remarkable improvement of breast cancer patients with vitamin C infusions. The genomic-loss of 5-hydroxymethylcytosine promotes malignant cell growth and vitamin C acts by increasing its levels.³ It acts on metastasized cancer tissue by reducing the tumour growth.² A recent study demonstrated breast cancer's strong association with chronic psychological stress-induced epinephrine release which boosts breast cancer stem-like characteristics through lactate dehydrogenase A-dependent (LDHA) metabolic stimulation. Vitamin C acts as a LDHA-lowering agent.⁴ In addition, it acts against many other carcinomas such as lung and kidney as well as lowers chemotherapy-induced adverse events.²

The mechanism of action of how vitamin C acts as an anticancer agent is not yet clear. Many studies suggest its pro-oxidant effects resulting from the production of H₂O₂ when plasma concentration of 14,000 μmol/L are met with intravenous administration.² It acts by enhancing cell cycle arrest, upregulating p53 gene, and decreasing energy metabolism and mitochondrial function. It also causes increased responsiveness of

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cancer cells to therapeutic agents and apoptosis regulated cell death.⁵ Due to its similar structure to glucose, it can also competitively enter cancer cells and destroy them.²

Although Vitamin C can boost the immune system and quality of life, care must be taken in patients with Glucose-6 dehydrogenase deficiency due to the risk of haemolysis that results from large doses.² Proper vigilance is required when determining doses due to a minimal difference in the dose related toxicity on normal breast versus cancer cells.³

Unfortunately, there is scarce literature or extensive clinical trials conducted on vitamin C's anticancer role which can assist in deciding the suitable time and dose of vitamin C for treatment.⁵ As breast cancer continues to rise in Pakistan,² studies pertaining to the treatment of breast cancer using Vitamin C are crucial. Adequate information can bring proper awareness among the health officials; and in turn the general population regarding its role.

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