Potential Therapeutic Implications of Caffeic Acid in Cancer Signaling: Past, Present, and Future

ABSTRACT

Caffeic acid (CA) has been present in many herbs, vegetables, and fruits. CA is a bioactive compound and exhibits various health advantages that are linked with its anti-oxidant functions and implicated in the therapy and prevention of disease progression of inflammatory diseases and cancer. The anti-tumor action of CA is attributed to its prooxidant and anti-oxidant properties. CA's mechanism of action involves preventing reactive oxygen species formation, diminishing the angiogenesis of cancer cells, enhancing the tumor cells' DNA oxidation, and repressing MMP-2 and MMP-9. CA and its derivatives have been reported to exhibit anti-carcinogenic properties against many cancer types. CA has indicated low intestinal absorption, low oral bioavailability in rats, and pitiable permeability across Caco-2 cells. In the present review, we have illustrated CA's therapeutic potential, pharmacokinetics, and characteristics. The pharmacological effects of CA, the emphasis on *in vitro and in vivo* studies, and the existing challenges and prospects of CA for cancer treatment and prevention are discussed in this review.