

Intravenous Vitamin C and Cancer: A Systematic Review.

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Abstract

Background. Intravenous vitamin C (IVC) is a contentious adjunctive cancer therapy, widely used in naturopathic and integrative oncology settings. We conducted a systematic review of human interventional and observational studies assessing IVC for use in cancer patients. **Methods.** We searched MEDLINE, EMBASE, The Cochrane Library, CINAHL, and AMED from inception to April 2013 for human studies examining the safety, effectiveness, or pharmacokinetics of IVC use in cancer patients. **Results.** Of 897 records, a total of 39 reports of 37 studies were included: 2 randomized controlled trials (RCTs), 15 uncontrolled trials, 6 observational studies, and 14 case reports. IVC dosing ranged from 1 g to more than 200 g ascorbic acid per infusion, typically administered 2 to 3 times weekly. IVC does not appear to increase toxicity or interfere with antitumor effects of gemcitabine/erlotinib therapy or paclitaxel and carboplatin. Based on 1 RCT and data from uncontrolled human trials, IVC may improve time to relapse and possibly enhance reductions in tumor mass and improve survival in combination with chemotherapy. IVC may improve quality of life, physical function, and toxicities associated with chemotherapy, including fatigue, nausea, insomnia, constipation, and depression. Case reports document several instances of tumor regression and long-term disease-free survival associated with use of IVC. **Conclusion.** There is limited high-quality clinical evidence on the safety and effectiveness of IVC. The existing evidence is preliminary and cannot be considered conclusive but is suggestive of a good safety profile and potentially important antitumor activity; however, more rigorous evidence is needed to conclusively demonstrate these effects. IVC may improve the quality of life and symptom severity of patients with cancer, and several cases of cancer remission have been reported. Well-designed, controlled studies of IVC therapy are needed.

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KEYWORDS:

ascorbic acid; cancer; chemotherapy; integrative oncology; interactions; intravenous vitamin C; naturopathic oncology; quality of life; systematic review; vitamin C

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