Abstract


Vitamin C: intravenous use by complementary and alternative medicine practitioners and adverse effects.

Padayatty SJ, Sun AY, Chen Q, Espey MG, Drisko J, Levine M.
Molecular and Clinical Nutrition Section, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, Bethesda, Maryland, United States of America.

BACKGROUND: Anecdotal information and case reports suggest that intravenously administered vitamin C is used by Complementary and Alternate Medicine (CAM) practitioners. The scale of such use in the U.S. and associated side effects are unknown.

METHODS AND FINDINGS: We surveyed attendees at annual CAM Conferences in 2006 and 2008, and determined sales of intravenous vitamin C by major U.S. manufacturers/distributors. We also queried practitioners for side effects, compiled published cases, and analyzed FDA’s Adverse Events Database. Of 199 survey respondents (out of 550), 172 practitioners administered IV vitamin C to 11,233 patients in 2006 and 8876 patients in 2008. Average dose was 28 grams every 4 days, with 22 total treatments per patient. Estimated yearly doses used (as 25g/50ml vials) were 318,539 in 2006 and 354,647 in 2008. Manufacturers’ yearly sales were 750,000 and 855,000 vials, respectively. Common reasons for treatment included infection, cancer, and fatigue. Of 9,328 patients for whom data is available, 101 had side effects, mostly minor, including lethargy/fatigue in 59 patients, change in mental status in 21 patients and vein irritation/phlebitis in 6 patients. Publications documented serious adverse events, including 2 deaths in patients known to be at risk for IV vitamin C. Due to confounding causes, the FDA Adverse Events Database was uninformative. Total numbers of patients treated in the US with high dose vitamin C cannot be accurately estimated from this study.

CONCLUSIONS: High dose IV vitamin C is in unexpectedly wide use by CAM practitioners. Other than the known complications of IV vitamin C in those with renal impairment or glucose 6 phosphate dehydrogenase deficiency, high dose intravenous vitamin C appears to be remarkably safe. Physicians should inquire about IV vitamin C use in patients with cancer, chronic, untreatable, or intractable conditions and be observant of unexpected harm, drug interactions, or benefit.

PMID: 20628650
FREE FULL TEXT