

Parenteral vitamin C for palliative care of terminal cancer patients

Two early studies in advanced/terminal cancer patients treated with high-dose vitamin C indicated subjective improvements in quality of life, including reduced pain and the need for analgesics.^{1,2} No control groups were included in these studies making it difficult to exclude a placebo effect. However, the authors stated that “any agent which can make, or even appear to make, the burden of terminal cancer more tolerable, deserves further study”.¹

Subjective changes in quality of life are difficult to measure and quantify. The European Organisation for Research and Treatment of Cancer (EORTC) has developed a reliable and valid Quality of Life Questionnaire comprising 30 core items (QLQ-C30).³ Multi-item scales include five functional scales (physical, role, cognitive, emotional, and social), three symptom scales (fatigue, pain, and nausea/vomiting), and a global health and quality-of-life scale. Additional single item scales include symptoms commonly reported by cancer patients (e.g. dyspnoea, appetite loss, sleep disturbance, constipation and diarrhoea) as well as the financial impact of the disease and treatment.

In 2007, Yeom et al⁴ used the EORTC QLQ-C30 to assess the quality of life of 39 terminal cancer patients before and after administration of IV vitamin C (10 g twice over three days) followed by oral vitamin C intake (4 g/d for one week). The patients reported significantly lower scores for fatigue, pain, nausea/vomiting, and appetite loss following administration of vitamin C. The patients also reported significantly higher scores for physical, role, emotional and cognitive function, as well as an overall improvement in their global health status (from a score of 36 to a score of 55) following vitamin C administration. In general, a difference of 4–10 points represents a small change, while a difference of 10–20 points represents a medium change in quality of life.⁵ Similar results have been reported in another quality of life study of 60 patients with advanced cancer.⁶

Fatigue is one of the most common and debilitating symptoms reported by cancer patients, and can affect quality of life more than pain.⁷ It is particularly common for patients undergoing chemotherapy, and may also persist for years after treatment completion.⁷ Although cancer-related pain can be managed with opioids, no effective therapy for fatigue has yet been identified. Numerous measures of fatigue have been developed, however, because fatigue is multidimensional in nature, i.e. expresses on physical, emotional and mental levels, multidimensional measures, such as the Multidimensional Fatigue Symptom Inventory (MFSI), offer more comprehensive information.⁸

We carried out a case study of an 81-year-old male who had been diagnosed in 2004 with a rare sarcoma of the left pulmonary artery. He underwent a left pneumonectomy with resection of the left pulmonary artery in 2005.⁹ He recovered from surgery and continued to have a good quality of life until a recurrent pulmonary angiosarcoma was diagnosed in 2013 and deemed inoperable by his oncologist. Intravenous vitamin C

(30 g/session, AscorL500, McCuff Pharmaceuticals, Santa Ana, USA) was initiated and quality of life (EORTC QLQ-C30)³ and fatigue (MFSI-SF)⁸ questionnaires were administered before and after seven days of vitamin C administration.

The quality of life questionnaire showed a 37% decrease in fatigue (from a score of 90 to a score of 57) and complete cessation of pain, nausea/vomiting and insomnia, as well as reduced loss of appetite, following vitamin C administration. Improvements in physical, emotional, cognitive and social functioning were also observed, as well as an enhancement of overall quality of life. With respect to the multidimensional aspects of fatigue, there were decreases in general, physical, emotional and mental fatigue, resulting in a 50% decrease in total fatigue following vitamin C administration.

Prior to vitamin C administration the patient was wheelchair bound, unable to walk unaided and totally dependent on physical assistance. Following vitamin C administration there was a complete reduction in pain (notably he no longer required analgesics), he was able to walk and do many other daily activities unaided, and he experienced a dramatic decrease in fatigue levels. The patient's primary carer also reported that the patient developed a more positive outlook on life. No adverse side effects of the vitamin C treatment were observed by the patient's primary carer and GP.

Placebo injections were not carried out as it was deemed by his GP to be unethical to withhold the intravenous vitamin C based on the severity of the patient's illness. As such, it is not possible to rule out a placebo effect, particularly as this effect tends to be more prevalent with measures of subjective symptoms such as pain.¹⁰ However, based on the varied functions of vitamin C in the body, from its role as a cofactor in the biosynthesis of carnitine, neurotransmitters and neuropeptide hormones, to its regulation of epigenetics and gene transcription,¹¹ it is plausible that vitamin C contributed to some of the observed quality of life effects.

It has been stated that "in terminal cancer patients the quality of life is as important as a cure".⁴ Although the optimal dose of vitamin C required for an improvement in quality of life has not yet been ascertained, it appears that it may be lower⁴ than the pharmacologic doses normally used for cancer treatment protocols.¹² Thus, based on accumulating evidence, parenteral vitamin C should be considered for the palliative care of terminal cancer patients.

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