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Dimethyl sulfoxide as an excitatory modulator and its possible role in cancer pain management

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Abstract

Intractable and untreatable pain from cancer remains a challenge for both patients and clinicians. The pain may be related to the disease itself or the consequences of treatment, such as surgery, chemotherapy or radiation therapy. Cancer pain is intense and has a major impact on patients' quality of life and survival. A significant number of patients receiving analgesic therapy with opioids report persisting pain of a higher intensity than the pain in those who were not on this class of drugs. The pathophysiology of pain in cancer patients is complex and remains poorly understood. Several research groups have studied and demonstrated that cancer and cancer-related symptoms may have an underlying problem of membrane hyper-excitability due to over-presentation of sodium channels and glutamate build-up or over-stimulation of glutamate/N-methyl-D-aspartate (NMDA)/α-amino-3-hydroxy-5-methyl-4-isoxazole-propionic acid (AMPA) system in cancer cells and the body. Dimethyl sulfoxide (DMSO) is a naturally derived, inexpensive, non-toxic solvent and pharmaceutical agent that has been demonstrated to have numerous health enhancing and therapeutic benefits. In the present article, we provide the scientific evidence and substantiate possible application of DMSO as a well-tolerated excitatory modulator in the management of cancer pain.

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