



L-Glutamine Use in the Treatment and Prevention of Mucositis and Cachexia: A Naturopathic Perspective

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Abstract

L-Glutamine (GLN) is considered a nonessential amino acid that has a variety of applications in naturopathic medicine. It has been postulated that in the critically ill patient, GLN becomes an essential amino acid for recovery, restoration, and repair at a cellular level. Mucositis is an intestinal mucosal damage of the gastrointestinal tract—mouth, throat, stomach, intestines, rectum, and anus—that is caused directly by chemotherapies and radiotherapies. Cancer cachexia is a significant biochemical event, which is characterized by weight loss, fatigue, and indicative of depletion of skeletal muscle GLN—a hypercatabolic state. There has been some question as to the use of GLN in this patient population because of its role as a preferred energy source not only for enterocytes and lymphocytes but for malignant cells as well. This article will address the questions of safety, efficacy, dosing, and toxicity of GLN used as an integrative therapeutic in ongoing naturopathic integrative cancer treatment.

Dosing and Toxicity

GLN may also enhance the selectivity of antitumor drugs by sensitizing the tumor cells to the oncological therapeutics while protecting normal cells in healthy tissues. This ability to evade chemoresistance is a very important finding to add to the strategies of integrative oncology. Dosing ranges may vary depending on the status of the individual patients' liver enzymes because GLN can transiently raise the levels of AST and ALT. Although there are no current data that contraindicate the use of GLN with elevated liver transaminases, the current clinical thinking is that if the AST/ALT levels are higher than 3 times the normal ranges, GLN should be used as a swish and spit, and not as a swish and swallow. Safe dosing strategies include continued monitoring of these enzyme levels for this possible effect of GLN supplementation. For effective and safe dosing strategies range from 10grams usually 3 times per day, swished and swallowed for optimum local contact of GLN with the mucous membranes.

Conclusion

Biochemical analysis, *in vitro* and *in vivo*, animal and human studies along with phase I-phase II human clinical trials with pilot phase III clinical trials have shown that oral GLN is a safe and effective strategy to prevent and treat mucositis, stomatitis and cachexia. Concerns are that GLN will preferentially be used by the cancer cells, giving a tumor protective effect. Results show that GLN is not taken up by the cancer but preferentially by the healthy non cancer tissues like muscles, gut mucosa, and lymphocytes. It has been shown that cancer growth is not only reduced by GLN but also counterbalanced by support of the lost GLN stores and GLN production in healthy cells. Immune function was also increased via the increased activity of NK cells by the suppression of the PGE2 series. Thus, GLN not only has a preventive effect against mucositis and cachexia but a therapeutic effect against cancer cells in relation to the host's defenses and ability to tolerate chemotherapy. GLN has gained acceptance as an essential amino acid, it not only modulates the immune system's function at the gut level but also promotes faster intestinal healing, significantly decreasing the severity of mucositis/stomatitis induced by chemotherapy and radiation therapy.