

L-Asparaginase in Feline Lymphoma

To evaluate its efficacy as a sole treatment, cats with confirmed diagnosis of lymphoma with no prior history of administration of chemotherapeutic drugs were administered a single IM injection of L-asparaginase (400 IU/kg body weight). Plasma amino acid profiles and ammonia concentrations were determined before, 48 hours after, and 1 week after drug administration to assess changes in plasma concentrations of asparagine, aspartic acid, glutamine, glutamic acid, and overall tumor burden. Results indicated that L-asparaginase significantly reduced asparagine concentrations within 2 days of treatment, although this effect was lost at 1 week after treatment. In the 13 cats in the study, 2 had complete responses (100% regression of measurable lesions) and 2 had partial responses (incomplete but 50% or greater disease regression). Four cats improved clinically but had stable disease; disease progressed in 5 cats, with 3 requiring additional antineoplastic therapy because of rapidly worsening clinical condition during the 7-day study period. The low response rate to L-asparaginase (30%) in this study could be due to inherent asparagine synthetase activity in feline lymphoma cells; inadequate dosing of the drug; and the cat's innate ability to continuously mobilize and transaminate amino acids, leading to prompt replenishment of asparagine stores.

COMMENTARY: Normal mammalian cells require L-asparagine to remain viable. Asparagine synthetase maintains adequate levels of L-asparagine in normal cells. Cells that lack asparagine synthetase, such as those found in lymphoreticular neoplasms, would die if L-asparagine were depleted. A bacteria-derived enzyme called L-asparaginase has the ability to break down asparagine, which at high enough doses could deplete abnormal cells of asparagine and cause cell death. Although the efficacy of a single agent has not been evaluated extensively, L-asparaginase has been used in multimodal protocols to treat canine and feline lymphoma. The data summarized in this article demonstrate L-asparaginase caused a reduction in plasma asparagine concentrations in cats at the current recommended dose, but the effect was not sustained. Adjustment of the currently recommended dose and dosing interval may be required to improve efficacy of this drug as a chemotherapeutic agent in cats with lymphoma. —*The Editors*

Effects of L-asparaginase on plasma amino acid profiles and tumor burden in cats with lymphoma. LeBlanc AK, Cox SC, Kirk CA, et al. *J VET INTERN MED* 21:760-763, 2007.