L-Asparaginase

BRAND NAMES: ELSPAR, ONCASPAR, and ERWINASE

BACKGROUND

To make an effective medication for the treatment of cancer, some fundamental difference between normal cells and cancer cells must be defined. The chemotherapy agent must exploit this cellular difference such that normal cells are spared and only cancer cells are injured. L-asparaginase exploits the unusually high requirement tumor cells have for the amino acid asparagine. Asparagine is an amino acid required by cells for the production of protein.

Tumor cells, more specifically lymphatic tumor cells, require huge amounts of asparagines to keep up with their rapid, malignant growth. This means they use both asparagine from the diet as well as what they can make themselves (which is limited) to satisfy their large asparagines demand.

L-asparaginase is an enzyme that destroys asparagine external to the cell. Normal cells are able to make all the asparagine they need internally whereas tumor cells become depleted rapidly and die.

HOW THIS MEDICATION IS USED

Mostly this medication is used against lymphoma but it also is used in some mast cell tumor protocols. Unlike other chemotherapy agents, it may be given as an intramuscular, subcutaneous, or intravenous injection without fear of tissue irritation. This is not a medication that one would use at home.

L-asparaginase is an enzyme commercially produced by bacteria. It is inherently a foreign protein and as such can produce an anaphylactic reaction. This is a rare complication but pre-treatment with anti-histamines or corticosteroids may be prudent in some cases.

L-asparaginase may interfere with blood clotting, may raise blood sugar levels, may raise liver enzyme blood tests, and may cause liver disease in some patients.

The only common side effect of this medication is vomiting.

Unlike other chemotherapy agents, suppression of blood cell production by the bone marrow is not considered to be a substantial problem with this medication.

INTERACTIONS WITH OTHER DRUGS

Methotrexate is another common anti-tumor drug. L-asparaginase and methotrexate work against each other and should be administered at least 48 hours apart.

Some other drugs can interact with this medication so tell your veterinarian about any drugs or foods that you currently give your animal. Do not give new foods or medications without first asking your veterinarian. Modified Live vaccines should never be given to any animal on cancer chemotherapy.

CONCERNS AND CAUTIONS

When L-asparaginase destroys asparagine, ammonia is a by-product. In patients with compromised liver function, the transient high levels of ammonia in the blood could pose a toxic problem. Liver disease does not preclude the use of L-asparaginase but it is important to watch for symptoms referable to liver disease (generally neurologic abnormalities/hepatic encephalopathy).

The use of L-asparaginase has been associated with pancreatitis.