onehealthinitiative.com

TKIs in Veterinary Oncology

Receptor tyrosine kinases (RTKs) work through ATP phosphorylation of tyrosine residues, allowing downstream cell signaling and eventual changes in gene regulation, cell proliferation, and survival. Mutations in RTKs and aberrant activation of their signaling pathways have been linked with cancer and other disease processes. RTKs are often abnormally activated in malignant tumors. Persistent cell signaling without negative regulation can induce uncontrolled cell proliferation and survival. Tyrosine kinase inhibitors (TKIs), a targeted therapy for cancer, have recently been used in veterinary medicine. There are 2 types of TKIs: small molecule inhibitors and monoclonal antibodies (mAbs).

Toceranib phosphate (Palladia, mypalladia.com), a small molecule inhibitor TKI currently approved for treatment of mast cell tumors in dogs, has been shown to inhibit phosphorylation of Kit, a receptor on mast cells necessary for their differentiation, survival, and function. By arresting cell proliferation and inducing cell cycle arrest and apoptosis, it has cytotoxic effects on tumor cells. Masitinib (Masivet, masivet.com) is a selective TKI with greater affinity and selectivity for the Kit receptor, thus a potentially improved safety profile. These veterinary-targeted cancer therapies may have potential for immunomodulatory effects on tumor recruited inflammatory cells, holding promise for their activity on other types of cancer cells as well.

Commentary

Use of receptor TKIs is increasing in small animal oncology. This treatment strategy offers promise for future approaches to multiple types of neoplasia, despite pitfalls and a potentially steep learning curve for their use. Although this report was written as an introduction to an entire issue devoted to receptor TKIs in veterinary cancer, it offered an overview of the biology and rationale of this new category of drugs.—*Suzanne Shelly Waltman, DVM, DACVIM (Oncology)*

Source

Receptor tyrosine kinase inhibitors: Molecularly targeted drugs for veterinary cancer therapy. Bavcar S, Argyle DJ. *VET COMP ONCOL* 10:163-173, 2012.

onehealthinitiative.com

Radioactive Cats: When Is It Safe to Go Home?

Radioiodine (^{131}I) is an established safe and effective treatment for feline hyperthyroidism, one of the most common endocrine diseases of older cats. Post ^{131}I administration, cats and their waste are radioactive and pose a risk to humans. Urine-soaked litter and feces were collected posttreatment from 30 cats over a 24-hour period q7d for 4 weeks. Twelve cats received 120 MBq doses, 10 received 150 MBq, and 8 received 200 Mbq. Over the first 3 weeks, there was significant decrease of ^{131}I in the urine and feces. The study found that the amount of radioactive material present after 2 weeks of treatment with a radioiodine dose of 100–200 MBq was classified as *low level waste* and could be disposed of in normal containers. However, small amounts of radiation were still present in the urine, in the feces, and on the cat for ≥2 weeks after this time, necessitating normal handling precautions. High-risk individuals may elect to avoid exposure during this time.

Commentary

Although ^{131}I is mainly excreted via the kidneys, there is a significant amount present in feces. This report helped support the need to isolate patients for some time after treatment; however, the isolation period during hospitalization may be significantly shorter than previously thought. Often, cats are released 2–4 days after treatment and then managed at home, with time and distance being the most important variables.

This study revealed that radioactivity does not rely on dose but time; a higher dose does not correlate to longer hospitalization. Therefore, owners should be able to care for cats posttreatment without concern about radioactivity causing harm in and around the home environment.—*Vincent Ziglioli, DVM*

Source

Measurement of the radioactivity of iodine in the excreta of cats treated with iodine-131 for hyperthyroidism. Lamb V, Gray J, Parkin T, Ramsey I. *VET REC* 172:45, 2013.