

Treating Neutropenia

Neutropenia is common in patients with hematopoietic disorders and immunodeficiency syndromes and can be induced by chemotherapy. Human granulocyte-colony stimulating factor (HuG-CSF) can be used to augment neutrophil levels in cats and dogs; however, long-term use can be associated with neutralizing antibodies and resultant neutropenia. This clinical trial evaluated the efficacy of recombinant feline (Fe) G-CSF as compared with HuG-CSF. Of primary interest was a pegylated form of FeG-CSF (PegFeG-CSF), in which a polyethylene glycol moiety is added to the protein structure to extend half-life and decrease the dosing interval. Daily FeG-CSF doses induced significantly greater neutrophil production than HuG-CSF after the second week of treatment, while weekly PegFeG-CSF dosing induced significantly higher neutrophil counts and sustained production as compared to FeG-CSF and controls. Peak neutrophil counts induced by PegFeG-CSF were achieved on day 1 posttreatment. When comparing the effects of long-term daily SC administration of FeG-CSF or HuG-CSF, neutrophil counts dramatically increased in all cats during the first week; however, cats treated with FeG-CSF had a more consistent and robust mean increase. All cats treated with HuG-CSF developed neutralizing antibody titers; PegFeG-CSF cats did not. Long-term (1-year) treatment with PegFeG-CSF in FIV-positive and FIV-negative cats resulted in increased neutrophil counts with each treatment cycle. PegFeG-CSF provided the most therapeutic and sustainable rise in neutrophils when compared with FeG-CSF and HuG-CSF, and was not associated with long-term neutropenia caused by neutralizing antibodies.

Commentary

Neutropenia in cats is commonly seen with retroviral (FIV and FeLV) infections, and with cytotoxic therapy. Other causes include parvoviral infection, myelodysplasia, storage diseases, sepsis, and immune-mediated and drug-associated neutropenias. In humans, recommendations for using G-CSF/GM-CSF are complex as clinical benefits are not apparent in all situations, although indications for its use are wide-ranging. PegFeG-CSF may be a major breakthrough in feline medicine. This study provides only pilot data, as few cats were used, not many had neutropenia, and the causes of neutropenia in some were unclear; nevertheless, the data are encouraging. Future larger clinical trials will be needed to determine true clinical efficacy of PegFeG-CSF and whether this could become a viable commercial product for veterinary use.—*Andrew Sparkes, BVetMed, PhD, DipECVIM, MRCVS*

Source

Pegylated feline granulocyte colony-stimulating factor increases neutrophil levels in cats. Coleman JK, Sakagawa Y, Tanabe T, et al. *VET J* 200;44-50, 2014.

Analysis Is Only as Good as the Analyzer

As in-house laboratory analyzers are costly and more subject to error than reference laboratories, continual quality control (QC) and maintenance programs are key. In this study, 452 veterinarian team members completed a 28-question online survey. Results showed that 92% of practices had an in-clinic laboratory; 89% reported most analyses were performed by veterinary technicians (licensed, registered, and nonlicensed). There was a large variation in respondent use and awareness of QC and quality assurance (QA) practices. The majority of respondents (88%) performed some type of QA on their laboratory equipment (eg, formal schedule for running control materials, manual review of blood smears, validation of in-house results against commercial laboratory results). Most provided a procedures manual for employee reference. Of 371 respondents to a question about logging and analyzing ELISA serologic data, 217 did not keep track of ELISA results for monitoring changes in disease incidence. Of 374 respondents to a question regarding what source was used to set their analyzer's reference intervals (RIs), only 99 established their own in-clinic RIs for their biochemistry analyzers. Although almost all practices have an in-clinic laboratory, QA is substandard in many cases. The American Society for Veterinary Clinical Pathology (ASVCP) has recently published a set of guidelines for in-clinic veterinary laboratories; better implementation of these minimum standards is strongly advised.

Commentary

Instituting proper maintenance and QC procedures of in-clinic analyzers is critical; however, additional QC procedures are often necessary to ensure reliable laboratory results. Practitioners must establish a competent person to be primarily responsible for the instrumentation. Placing individuals with minimal medical expertise in charge of instruments from which patient data is generated could compromise patient care. The QA and laboratory standards committee of ASVCP has established recommended criteria for QA of in-clinic analyzers. For specific references, visit asvcp.org/about/committees/qas.cfm.—*Johanna Rigas, MS, DVM, DACVP*

Source

Survey of point-of-care instrumentation, analysis, and quality assurance in veterinary practice. Bell R, Harr K, Rishniw M, Pion P. *VET CLIN PATH* 43:185-192, 2014.