Canine B-Cell Lymphoma

The standard of care for B-cell lymphoma (BCL), one of the most common neoplasms in dogs, is a combination chemotherapy protocol usually consisting of cyclophosphamide, hydroxydaunorubicin/doxorubicin, vincristine (Oncovin), and prednisone (CHOP). CHOP therapy typically extends survival from 6 weeks to 10 to 14 months. The addition of the monoclonal antibody rituximab to CHOP treatment in human non-Hodgkin's lymphoma cases has significantly increased response and survival rates. Rituximab targets CD20-positive B cells. This study described the creation of an anti-CD20 antibody used to treat B-cell lymphoma in dogs. A panel of anticanine CD20 monoclonal antibodies was generated; one antibody (mouse monoclonal antibody 1E4) was selected because it binds to nearly the same location of CD20 as does rituximab. Chimeric antibodies were next assembled using 2 canine IgG subclasses. Two of these, 1E4-cIgGB and 1E4-clgGC, were found to significantly deplete B-cell levels in healthy beagles in a manner similar to that seen when humans with normal lymphocyte levels are treated with rituximab. However, because of difficulties encountered in the production of 1E4-clgC, only 1E4-clgGB was selected for further research and development for treating canine B-cell lymphoma.

Commentary
The development and use of rituximab in combination with chemotherapy for diffuse B-cell lymphoma in humans has dramatically improved disease-free time and overall survival as compared with chemotherapy alone. However, rituximab does not bind or deplete canine B cells; this renders it unusable for canine lymphoma treatment. This article described the development of a canine B-cell monoclonal antibody targeting canine CD20. Currently, a B-cell monoclonal antibody is USDA-approved and under investigation for efficacy when combined with chemotherapy; similarly, a T-cell monoclonal antibody targeting CD52 is conditionally approved by the USDA and under investigation. Although published efficacy data are pending, early results are promising; these developments represent significant steps forward in improving the prognosis for dogs with lymphoma.—Sandra Bechtel, DVM, DACVIM (Oncology)

Reference

Source