Public Abstract

First Name:Kimberly

Middle Name:

Last Name:Menard

Adviser's First Name:Sandra

Adviser's Last Name:Bechtel

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SP 2017

Department:Biomedical Sciences

Degree:MS

Title:A novel approach to the clinical diagnosis and treatment of canine histiocytic sarcoma

This work provides a review of canine histiocytic sarcoma (HS) including background immunology, diagnosis, treatment, and prognosis. Given the poor prognosis of HS compared to other soft tissue sarcomas in dogs, the research performed focuses on diagnosis including immunohistochemistry (IHC), the use of a combination treatment protocol in cell culture, and potential use of serum biomarkers in monitoring response to treatment. The use of different IHC markers on formalin fixed tissue samples were evaluated in their ability to differentiate HS from soft tissue sarcomas. Initially a dendritic cell marker, CD206, was evaluated; however, due to lack of staining in canine formalin tissues, the study was continued with CD204 and Iba-1 compared to CD18 which is what is currently being used by most pathologists. The IHC stains were performed on 20 tissue samples from dogs previously diagnosed with HS and other soft tissue sarcomas. The results showed that there was only a significant difference in staining seen between these 2 tumor types when using Iba-1 or when combining the IHC scores together indicating that a panel of different IHC markers may be best for diagnosis of HS.

Currently, the prognosis for dogs with HS is very poor with many dogs only living a few months even with chemotherapy treatment. In this study, we evaluated the potential use of combining currently used chemotherapy drugs (vinca alkaloids and lomustine) together to determine their effectiveness at killing canine histiocytic cells in culture. The results obtained in the first cell line studied did not show a difference in the effectiveness of these drugs when combined compared to when giving individually.

Thymidine kinase 1 (TK1) is a marker of cellular proliferation and can be measured in the serum and used as a biomarker in both dogs and humans. In this study, we evaluated the use of TK1 along with C-reactive protein in an algorithm called the neoplasia index in dogs diagnosed with HS. These biomarkers were measured in the serum at the time of diagnosis and then every few weeks during treatment. The results showed that dogs with HS consistently have a high TK1 at the time of diagnosis; however, no conclusions could be drawn as to the correlation with these biomarkers and response to treatment due to the small number of dogs enrolled.

The findings here are important as the diagnosis of HS can often be challenging on biopsy, and an accurate diagnosis is crucial given the vast difference in prognosis between HS and soft tissue sarcomas. Additional studies need to be performed on more canine histiocytic cell lines before determining if a combination protocol including vinca alkaloids and lomustine may be useful in dogs with HS. Lastly, TK1 was increased in dogs with HS so may have a role in diagnosis or potentially screening in genetically predisposed breeds such as Bernese mountain dogs.