Parvovirus Myocarditis in Young Dogs

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In the Literature

Ford J, McEndaffer L, Renshaw R, Molesan A, Kelly K. Parvovirus infection is associated with myocarditis and myocardial fibrosis in young dogs. *Vet Pathol.* 2017;54(6):964-971.

FROM THE PAGE …

Canine parvovirus is typically caused by canine parvovirus type 2, a single-stranded, nonenveloped DNA virus. Dogs 6 weeks to 6 months of age are at the highest risk for infection; however, infection can occur earlier. Puppies infected within 2 weeks of birth are at a high risk for the virus invading the cardiac myocytes, which can result in fatal necrotizing myocarditis. Some dogs will survive the acute infection but may later develop heart failure secondary to lymphocytic myocarditis and fibrosis. Although parvovirus infection has been less commonly seen since the development of a vaccine, the authors of this study hypothesized that parvoviral infection of myocardial cells is underrecognized as a cause of cardiac damage in dogs younger than 2 years.

This retrospective study examined tissue archives of dogs 2 years of age or younger from June 2007 to November 2015. Forty dogs with a diagnosis of myocardial necrosis, inflammation, or fibrosis were identified, along with 41 age-matched controls. Histopathology of the samples was graded based on severity of myocardial necrosis, inflammation, and fibrosis on a scale of 0 to 3, with 0 indicating normal tissue and 3 being most severe (≥25% area of total tissue affected). In addition, PCR and reverse transcription quantitative PCR (RT-qPCR) were used to identify parvoviral DNA in the tissue samples. Immunohistochemistry and in situ hybridization (ISH) were performed on any case or control sample that tested positive with PCR or RT-qPCR.

PCR identified parvoviral DNA in 12/40 cases and 2/41 controls; RT-qPCR identified the same cases. Immunohistochemistry identified parvoviral material in 7/12 positive PCR cases, whereas ISH signal was detectable in 9 of these 12 cases. Immunohistochemistry and ISH were negative in both PCR-positive control cases.

… TO YOUR PATIENTS

Key pearls to put into practice:

1. Parvoviral myocardial infection appears to be a more common cause of myocardial damage in young dogs than previously thought, despite widespread vaccination.
2. PCR-based detection of canine parvovirus type 2 is a reliable, inexpensive, and rapid method to presumptively identify parvoviral myocarditis; ISH can provide an alternative for diagnosis, with higher sensitivity than immunohistochemistry.