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**Relationship between Uveal Inflammation and Viral Detection in 30 Cats with Feline Infectious Peritonitis**

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Introduction: Feline infectious peritonitis (FIP) virus is the most common infectious cause of uveitis in cats. Confirmatory diagnosis is usually only reached at postmortem examination. The relationship between the histologic inflammatory pattern, which depends on the stage of the disease, and the likelihood of detection of the viral antigen and/or RNA has not been investigated. Though advanced testing modalities are available, reported success of immunohistochemical labelling for the viral antigen in cases of FIP ophthalmitis has been limited, and detection of viral RNA by reverse transcription real-time polymerase chain reaction (RT-qPCR) or in situ hybridization (ISH) in ocular tissues has not been previously reported. We hypothesized that viral detection rate by either immunohistochemistry (IHC), ISH or RT-qPCR is dependent upon the predominant type of uveal inflammatory response (i.e., pyogranulomatous vs. plasmacytic). Thus, the aims of this study were to evaluate cases of FIP-induced uveitis, localize the viral antigen and RNA, and assess the relationship between the inflammatory pattern (macrophage- vs. plasma cell-rich) and the likelihood of detecting the FIP antigen and/or RNA.
Methods: We evaluated the eyes of 30 cats with FIP-induced uveitis by thorough ocular histopathological analysis and comparison of RT-qPCR, IHC and RNAscope® ISH for the detection of FIPV in the uveal tract and its correlation with the type of inflammatory pattern within affected eyes.
Results: Complete necropsy findings were available in 27 of the 30 cases, with 81.4% of cats having the dry form. The most common site of ophthalmitis was the anterior uvea, with cyclitis in 86.7% and iritis in 80.0% of cases. Overall, 30.0% (9/30) cases had detectable viral antigen, and 33.3% (10/30) had detectable viral RNA within uveal macrophages, of which 8 cases tested positive by RT-qPCR. An overall high agreement and positive correlation was noted between the three methods (kappa statistic and ? >0.7, respectively). Rank biserial correlation analysis determined a weak to moderate but significant negative correlation between the degree of plasmacytic uveal inflammation and the likelihood of detecting FIPV antigen (rrb = ?0.466, p-value = 0.004) and RNA (rrb = ?0.373, p-value = 0.028).
Conclusions: Our results demonstrate that the later stages of the disease, which are characterized by heavy plasmacytic inflammation, are associated with lower detection rates of viral antigen and RNA, and therefore, the odds of confirming the diagnosis of FIP-induced uveitis are significantly lower when a plasma cell-rich infiltration predominates in affected eyes.