CIRDC: Why so complicated?

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Overview of the Issue

Cough is one of the most common presenting complaints in small animal medicine and perhaps one of the most frustrating for clients and veterinarians alike. While upper respiratory infection (URI) was once thought to be a single pathogen infection, today's diagnostics confirm it is most often multi-pathogenic. Armed with current data, clinicians have opportunity to mitigate the course of CIRDC in patients and more effectively prevent URI in canine patients with strategic vaccine recommendations.

Objectives of the Presentation

1. Describe a typical clinical presentation of CIRDC
2. List 3 of the most common pathogens associated with clinical CIRDC
3. List 2 ways to prevent CIRDC

Key Etiologic and Pathophysiologic Points

Pathogens most often involved in canine URI in order of frequency are:

1. M. cynos+CPIV
2. M. canis+CPIV
3. M. cynos+CPIV+M. canis
4. CPIV+B. bronchiseptica
5. M. canis+B. bronchiseptica

All involved pathogens are easily transmissible during routine contact among dogs in typical social settings (dog parks, play groups, etc.). While CIRDC most often begins and ends as an URI, it can progress to more severe disease in some dogs. Depending on the pathogens involved, clinical course for any canine URI can move quickly and become a severe pneumonia in a mere 24 hours.

Typically, infections involving both a virus and a bacteria produce more severe disease than infections that are purely bacterial or viral.

Key Clinical Diagnostic Points

When clinical disease is multi-pathogenic in nature, appropriate diagnostic testing becomes more critical to stemming the course of disease. The sooner diagnostic testing is performed in the course of infection, the more likely an accurate picture of the causative agents will be obtained. Culture and sensitivity are less helpful than molecular testing in CIRDC given the mixed nature of most infections. When possible, quantitative PCR (qPCR) should be employed to best distinguish pathogenic microbes

from commensal organisms. *Mycoplasma sp.* and other CIRDC bacteria are found in clinically healthy canine upper respiratory tracts.

Key Therapeutic Points

Supportive care, including antibiotics and cough suppressants, is the treatment of choice, however, clinicals should remember that isolation of CIRDC patients is appropriate to limit disease transmission. Additionally, as Mycoplasma sp. are inherently resistant to penicillin, doxycycline is typically the recommended antibiotic for canine URI. A cough may persist beyond cessation of therapy due to significant inflammation of the respiratory tract and it is prudent to manage client expectations regarding cough resolution.

Summary including KEY "TAKE HOME" POINTS

1. Canine parainfluenza virus is the common denominator in most canine upper respiratory infections.
2. Mucosal immunity is crucial in the prevention of CIRDC transmission.
3. Appropriate vaccination as well as prompt clinical attention is key to preventing CIRDC from becoming complicated and lethal.

References/Suggested Reading

1. Watson CE, Bell C, Toohey-Kurth K. H3N2 Canine Influenza Virus Infection in a Dog. Vet Pathol. 2017 May;54(3):527-530.
2. Weese JS, Stull J. Respiratory disease outbreak in a veterinary hospital associated with canine parainfluenza virus infection. Can Vet J. 2013;54(1):79-82.
3. Maboni G, Seguel M, Lorton A, Berghaus R, Sanchez S (2019) Canine infectious respiratory disease: New insights into the etiology and epidemiology of associated pathogens. PLOS ONE 14(4): e0215817.
4. Billen F, Peeters D, Dehard S, Day MJ, Clercx C. Distribution of leucocyte subsets in the canine pharyngeal tonsil. J Comp Pathol. 2006 Aug-Oct;135(2-3):63-73.
5. Scott-Garrard MM, Chiang YW, David F. Comparative onset of immunity of oral and intranasal vaccines against challenge with Bordetella bronchiseptica. Vet Rec Open. 2018 Aug 13;5(1):e000285. doi: 10.1136/vetreco-2018-000285. PMID: 30167313; PMCID: PMC6109801.
6. Tizard IR. Canine vaccines. Vaccines for Veterinarians. 2021:153–166.e1. doi: 10.1016/B978-0-323-68299-2.00022-8. Epub 2020 Jul 10. PMCID: PMC7348620.