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Popular Article

Canine Coronaviruses: A Puzzle Piece in the One Health Landscape

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Introduction:

As RNA viruses, the Canine Coronavirus (CCoV) normally infects the digestive system of dogs and causes gastrointestinal illness by infecting the digestive tract of dogs with an outer layer of protective RNA. Although CCoVs often end up being limited to a particular species of animal, they can still pose a risk of spreading to humans. It is presented in this review paper that CCoVs are discussed holistically in relation to One Health, focusing specifically on their study of viruses, patterns of disease transmission, potential for the spread of diseases to humans, and impact on global health policies of developing countries. By analyzing the relationships between human, animal, and environmental health and the management of CCoV, this study emphasizes the importance of a collaborative approach to the surveillance, prevention, and control of CCoV.

During the past few years, canine coronaviruses (CCoVs) have gained a great deal of attention because of their potential as a vector for human transmission and their significance when it comes to the concept of One Health. As a member of the Coronaviridae family, CCoVs are characterized by their enclosed structures and single-stranded RNA genomes that make them stand out. Even though the main target of these parasites is the digestive system of dogs, it is known that this will cause gastrointestinal problems in varying degrees. The potential for them to infect humans and their potential impact on global health are among the growing concerns regarding their ability to spread disease. Accordingly, this review seeks to analyze and evaluate CCoVs in a comprehensive manner throughout the framework of One Health. As part of this research, the researchers examine the viral

characteristics of these pathogens, their spread patterns, the potential for their transmission between animals and humans, and how they might impact public health measures.

Virology of Canine Coronaviruses:

Coronaviruses CCoV are usually classified into two main groups according to their genotypes: type I CCoVs and type II CCoVs. As a rule, dogs that are infected with canine Coronavirus type I tend to experience minor gastrointestinal symptoms. However, dogs infected with CCoV type II tend to suffer from more severe illnesses, and some of the symptoms may be life threatening. Most of these viruses reproduce in the epithelial cells of the small intestine, which results in inflammation and diarrhea. As you may know, canine Coronaviruses (CCoVs) are extremely contagious and can spread rapidly throughout small dog populations, especially in areas where there is poor hygiene and overcrowding.

Transmission Dynamics and Epidemiology:

Fecal-oral transmission of CCoVs occurs when infected dogs excrete the virus in their feces. Factors such as direct physical contact, cohabitation, and environmental pollution facilitate CCoV transmission among dogs. In epidemiological studies, CCoV transmission has been associated with multiple risk factors, including age, breed, and vaccination status. There have been reports of CCoV infections in other carnivore species, despite the fact that CCoVs are typically believed to affect only certain species. There have been inquiries regarding the transmission of disease between species as a result.

Zoonotic Potential and Public Health Implications:

As CCoVs are primarily targeted at dogs, increasing evidence indicates they are also capable of infecting humans. In spite of the fact that it is rare to transfer Coronaviruses from dogs to humans, genetic recombination and mutation can occur, leading to the development of new Coronaviruses that are more likely to spread to humans. A number of zoonotic coronavirus outbreaks, such as SARS-CoV and SARS-CoV-2, have highlighted the importance of understanding and monitoring Coronaviruses in order to prevent possible transmission events. To address the dangers associated with CCoVs, public health initiatives include promoting responsible pet ownership, improving surveillance efforts, and establishing measures to limit the spread of the virus.

One Health Approach to CCoV Control:

One Health promotes a cooperative approach in addressing intricate health issues by emphasizing the interdependence between the health of humans, animals, and the environment. An integrated approach to CCoVs requires combining surveillance, prevention, and control activities



across human and animal populations. CCoV prevalence is monitored in dogs as part of this project. In addition to advocating vaccination and hygiene protocols, the organization employs strategies to reduce the risk of transmission between domestic and wild animals. It is our hope that a multidisciplinary approach will allow us to better comprehend, monitor, and reduce the risks associated with CCoV, both in terms of dogs and humans.

Challenges and Future Directions:

Despite improvements in the understanding of CCoVs, there remain various obstacles to overcome. The factors contributing to this problem include the lack of surveillance capabilities in many areas, the shortcomings in understanding the dynamics of interspecies transmission, as well as the need for increased communication and collaboration between various sectors. CCoV prevention and management should be prioritized in future research endeavors, with an emphasis on improving diagnostic tools, improving surveillance networks, and exploring creative approaches to CCoV prevention and management. To ensure the effectiveness of CCoV control programs, measures that target fundamental socioeconomic variables, such as poverty and access to veterinary services, should be included.

Conclusion:

Combined with the One Health framework, canine Coronaviruses play a key role in emphasizing the interdependence of the health of humans, animals, and the environment. The application of a cooperative and multidisciplinary approach will allow us to better understand, monitor, and mitigate the hazards posed by CCoVs to both canine and human populations. Research, surveillance systems, and preventative measures can be implemented to contribute to a healthier and safer future.

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