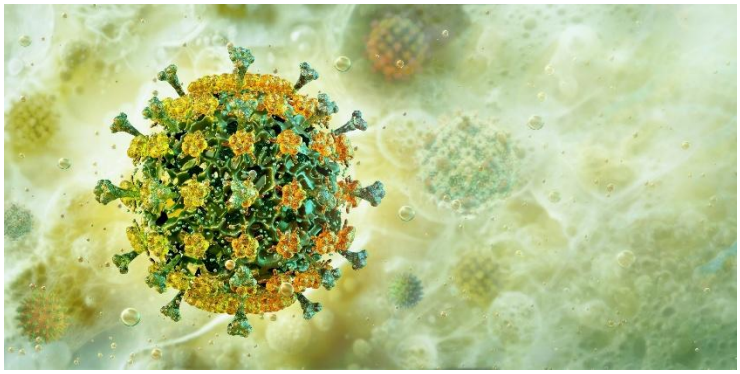
From Influenza D and Canine Coronavirus HuPn-2018 Emerging Respiratory Virus Threats

Researchers synthesized data from veterinary and human epidemiological studies to explain the current state of global preparedness against two newly recognized high-risk viral candidates, Influenza D virus (IDV) and Canine Coronavirus HuPn-2018 (CCoV-HuPn-2018).

Review findings highlight that these viruses have already established a foothold in livestock (particularly IDV) and that evidence of human exposure and possible infections is accumulating, especially in high-risk occupational groups. It suggests that routine diagnostics and surveillance systems do not currently account for these viruses, calling for the development of commercial diagnostic tests and targeted "One Health" surveillance at the human–animal interface to reduce the risk that public health officials will be caught off guard by another preventable epidemic.



Study

The current Perspective review draws on published virological, serological, and epidemiological studies to examine whether the global health community may be overlooking two emerging respiratory viruses that are showing signs of widespread animal circulation and possible adaptation to human hosts: Influenza D virus (IDV) and Canine Coronavirus HuPn-2018 (CCoV-HuPn-2018).

The authors focus on evidence describing the ecological reach and transmission potential of the viruses of interest. Accordingly, the review discusses findings from:

1. Animal reservoirs, surveillance data from pigs, cattle, poultry, and wildlife (including deer and camels), to determine viral prevalence.
2. Human serology studies measure antibody levels in high-risk populations, such as cattle workers in Florida and dairy workers in Colorado, to detect prior exposure.
3. Clinical samples, genomic sequencing of nasopharyngeal swabs and other specimens from patients hospitalized with pneumonia in Malaysia, Vietnam, Haiti, and the United States (US).
4. Laboratory models, experiments using ferrets and human airway epithelial cells to test the viruses' ability to replicate and, in animal models, transmit through the air.

Findings

This Perspective paper provides a cautious but forward-looking overview of the current state of viral research and surveillance preparedness for the viruses of interest, highlighting that signals

of zoonotic exposure and infection may be more widespread than is currently captured by routine surveillance systems.

IDV was first identified in pigs in 2011 and is structurally similar to Influenza C but has a much broader host range. The review highlights that cattle are a massive reservoir for the virus, contributing to the billion-dollar "bovine respiratory disease complex."

In a study of Florida cattle workers, over 97 % tested positive for neutralizing antibodies against IDV, compared to only 18 % in a control group, highlighting marked occupational exposure rather than confirmed clinical disease.

A 2023 study of dairy workers in Colorado found that 67 % of the 31 participants had molecular evidence of the virus in their noses over a five-day period, suggesting that transient, likely subclinical infections may occur frequently in this demographic.

Most alarmingly, recent research from China found that 73 % of 612 investigated participants showed serological evidence of infection. When considered alongside laboratory experiments showing that IDV can transmit via airborne droplets between ferrets and replicate efficiently in human airway epithelial cells, the authors argue that the virus may possess features compatible with human-to-human transmission, although direct evidence of sustained transmission in humans is still lacking.

CCoV-HuPn-2018 was identified as a novel recombinant "chimera" virus that harbors genes from canine and feline coronaviruses. Since its isolation from a child with pneumonia in Malaysia in 2021, it has been detected in multiple countries and regions, suggesting a potentially broad geographic distribution.

Surveillance studies in Hanoi, Vietnam, have detected the virus in 18 of 200 (9 %) patients hospitalized with pneumonia, highlighting the virus's possible association with respiratory disease rather than a confirmed causal role. Crucially, this virus is entirely missed by standard clinical respiratory panels, meaning these infections are likely being misdiagnosed or labeled as "pneumonia of unknown origin."

Evolutionary and cell-culture studies further suggest that the virus can infect human cells independently of the standard aminopeptidase N receptor, raising concerns that it may be exploring alternative pathways for human cell entry.

Conclusion

The present Perspective paper concludes that IDV and CCoV-HuPn-2018 represent potentially important but still poorly characterized threats to public health. Their cryptic nature, where patients may be hospitalized with respiratory illness while standard diagnostic tests return negative results, suggests these viruses could be unrecognized contributors to a subset of pneumonia cases, although the overall burden of disease remains unknown.

Consequently, the paper calls for the immediate development of commercial real-time reverse transcription PCR (RT-PCR) tests specifically targeting these pathogens. Furthermore, it advocates for a shift toward "panspecies" diagnostics and the strategic, targeted use of agnostic next-generation sequencing, specifically focused on the "human–animal nexus" (e.g., farms and markets) where spillover risk is highest.

Source:

https://www.news-medical.net/news/20260202/Overlooked-animal-viruses-slipping-past-global-disease-surveillance.aspx