

Changing clinical patterns and ear-nose-throat complications of seasonal viral respiratory tract infections

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The epidemiology of viral respiratory tract infections has undergone important changes throughout and following the COVID-19 pandemic,^{1,3} with many viruses losing their seasonality at least temporarily and returning with higher virulence after a period of apparent absence, as was seen for respiratory syncytial virus (RSV) and influenza viruses, to name only a few.

Specifically for RSV, an initial decrease in the number of cases was seen during the early phase of the COVID-19 pandemic, followed by heightened inter-seasonal circulation in the summer of 2021 and an earlier start to the 2021/22 season,⁴ which affected mainly younger children, particularly infants with ages below 6 months, and associated higher hospitalization rates compared to pre-pandemic seasons.⁵ Importantly, heightened severity of RSV infection was reported among elderly adults hospitalized with acute respiratory illness from 2022 to 2023 in the USA, with higher requirement for supplemental oxygen administration, including invasive mechanical ventilation, and higher rates of death reported

for RSV compared to other respiratory tract infections such as COVID-19 and influenza.⁶

Influenza virus circulation was at an all-time low during the 2020/21 season,¹ followed by an unusually late start of the 2021/22 season⁷ and an earlier start of the 2022/23 season, which was associated with high incidence and disease severity particularly among children and adolescents, as reported from the USA by the Centers for Disease Control and Prevention (CDC).⁸

Among the viruses whose epidemiology was least impacted by the COVID-19 pandemic, human rhinoviruses continued to circulate throughout the lockdowns, restrictions and compulsory non-pharmaceutical interventions, with only a short gap in their circulation reported to have occurred from March to May 2020, followed by subsequent activity comparable to non-pandemic seasons.¹

Of interest is the recent change in the clinical pattern of rhinovirus infections that we have observed during these past months in the clinic, since the beginning of the current cold season.

Specifically, we would like to draw attention to the high similarity between this season's rhinovirus infections and influenza, with pediatric and adult patients presenting with fairly high fevers, that last for several days, and that may be clinically misdiagnosed as influenza or as upper or lower respiratory tract bacterial infection or superinfection, in settings where access to rapid antigen or molecular testing is not available.

Furthermore, of late we have seen relatively high rates of rhinovirus-associated ear-nose-throat complications such as maxillary or frontal sinusitis as well as otitis media, and lower respiratory tract complications such as bronchitis. This can lead to unnecessary prescription of antimicrobials, if not properly recognized as a transitory viral-driven

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inflammation, and mistaken for a bacterial superinfection.

For this reason, it is extremely important to accurately recognize post-viral acute rhinosinusitis, which can last up to 12 weeks following the initial viral infection, and to differentiate it from bacterial sinusitis, to avoid unnecessary antibiotic use.⁹

Rhinovirus in itself is a cause of sinusitis, and the virus has been identified in sinus aspirates from patients with acute maxillary sinusitis, in the absence of bacterial superinfection.¹⁰ Rhinovirus has also been reported as the most common virus detected in patients with chronic rhinosinusitis, and the proposed pathophysiological mechanisms include virally-induced persistent hyper-responsiveness of nasal mucosa.¹¹

In viral and post-viral sinusitis, the mainstay of treatment is symptomatic and pathogenic, based on systemic nonsteroidal anti-inflammatory drugs or paracetamol coupled with systemic decongestants and complemented by intranasal irrigation with sterile physiologic or hypertonic saline, and local administration of intranasal decongestants.

Similarly, during acute viral upper respiratory tract infections, Eustachian tube dysfunction occurs in most (50-80%) patients,¹⁰ and in the majority of cases it never leads to true otitis media and it resolves with symptomatic and pathogenic treatment, as described above.

In-depth research is needed in order to confirm these clinical observations and to determine whether we are indeed seeing a change in rhinovirus clinical patterns, or whether we are actually only beginning to understand the full spectrum of viral clinical illness now that molecular diagnosis is in place in many settings, allowing an etiological diagnosis of many of the clinical syndromes that would have otherwise been misdiagnosed as bacterial respiratory tract infections.

In conclusion, whenever faced with changes in the epidemiology or the clinical patterns of viral pathogens, attentive clinical observation should be coupled with etiological diagnosis in all settings where possible, at least in the

beginning of each cold season or each pathogen-specific wave. This should be followed by thorough standardized data collection and statistical reporting, in order to provide valuable information and actionable clinical advice.

Author contributions: MS contributed to conceptualization, literature review, validation, writing – original draft, writing – review and editing, and supervision. OS contributed to conceptualization, data acquisition, literature review, validation, writing – original draft, writing – review and editing, and supervision. Both authors read and approved the final version of the manuscript.

Conflicts of interest: All authors – none to declare.

Funding: None to declare.

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Please cite this article as:

Săndulescu M, Săndulescu O. Changing clinical patterns and ear-nose-throat complications of seasonal viral respiratory tract infections. *GERMS*. 2023;13(4):311-313. doi: 10.18683/germs.2023.1399