Increased Incidence of Vestibular Disorders in patients with SARS-CoV-2

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Introduction

- SARS-CoV-2 is a betacoronavirus that causes the clinical syndrome termed COVID-19
- As high as 70% of patients that tested positive for COVID-19 continue to complain of symptomatic sequelae 6 months after initial date of infection
- The most common long-term otolaryngologic sequalae include chemosensory deficits (ie. smell and taste), with prevalence as high as 47.4%
- Sudden sensorineural hearing loss, tinnitus, and vestibular dysfunction have also been reported, but has not been extensively studied
- In this study, we investigated the incidence of vestibular and balance disorders associated with COVID-19 variants

Methods

- Retrospective analysis of data from National COVID Cohort Collaboration Database (N3C)
- 12-week “peak period” for each variant (initial/untyped, alpha, delta, omicron) were determined using data from covariants.org
- N3C database was queried for patients with positive COVID-19 tests within each variant peak and a vestibular disorder diagnosis (ICD-10: R42) occurring within 2 weeks of the test date
- Incidence of vestibular disorder (ICD-10: R42) during peak of each variants were determined and compared to COVID-19 negative population during the 4-week period centered at peak period of each variant

Results

- 8,878,007 patients met inclusion criteria
- 17.9% of these patients tested positive for COVID-19
- 0.9% of COVID-19 positive patients diagnosed with vestibular dysfunction
- COVID-19 positive patients are twice as likely to develop vestibular dysfunction compared to normal population

	Initial/Untyped	Alpha	Delta	Omicron
COVID-	7,286,813	7,084,227	6,286,440	6,227,305
COVID- w/ VD	31,970	32,104	27,121	24,159
COVID+	229,823	162,042	395,902	803,427
COVID+ w/ VD	1,949	2,051	3,810	6,956
Odds Ratio	1.94*	2.82*	2.24*	2.24*
95% CI	1.85 - 2.03	2.69 - 2.95	2.17 - 2.32	2.18 - 2.30

Table 1. Incidence of vestibular disorder, by variant period

Abbreviation: VD, vestibular disorder

*$p < 0.001$

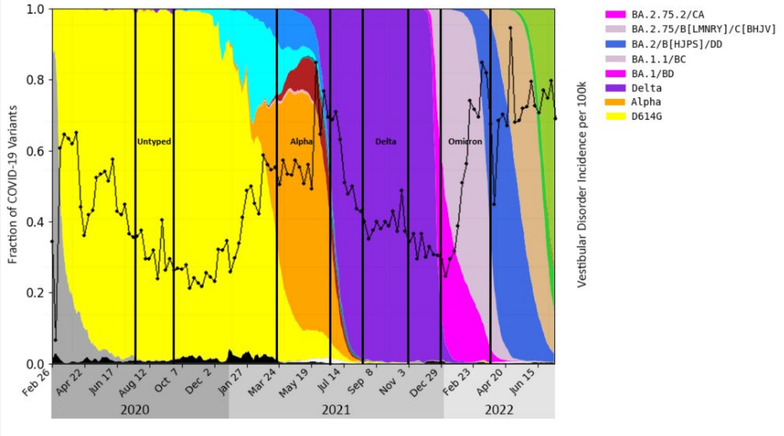

Figure 1. Incidence of vestibular disorder and prevalence of COVID-19 sub-types.

Discussion

- Patients testing positive for COVID-19 are more than twice as likely to develop symptoms of vestibular dysfunction
- Individual testing positive for alpha variant are at greatest risk of developing symptoms of vestibular dysfunction
- However, the data is difficult to assess, given individuals whose vestibular symptoms remain undiagnosed, those that did not seek medical attention for their vestibular symptoms, and those who were never tested and diagnosed with COVID-19
- With over 600 million individuals infected globally and nearly 100 million of them within the United States at the time of writing, this constitutes over 3 million people with vestibular disorder likely related to COVID-19, with at least 500,000 of those individuals residing in the United States
- Patients with COVID-19 related vestibular dysfunction have demonstrated a different clinical course and compensate slower than that of the general population[5]
- Understanding the clinical course of COVID-19 related vestibular dysfunction and inter-variant risks of developing symptoms will better guide patient education and treatment options

References

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