Intracranial Complications Secondary to Acute Mastoiditis and Sinusitis in the Post-Covid Era: A Preliminary Report

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Introduction

- COVID-19 pandemic had a global impact on healthcare. In the post-COVID era, research has shown increased incidence of disease processes and their complications.[1]
- Pediatric acute otitis media and sinusitis are generally thought to be very treatable with conservative management. However, intracranial progression of disease, such as meningitis, abscess, and sinus thrombosis, carry significantly higher risks of morbidity and mortality.
- Rosamilia et al (2023)[2] performed a database study and found an increased in number and worsened severity of sinusitis cases in the post-COVID ear compared to the pre-COVID era. This is similar to what we have observed at our institution.
- In this study, we hypothesized an increase in intracranial complications secondary to otolaryngologic infections (acute mastoiditis and sinusitis) in the post-COVID era.

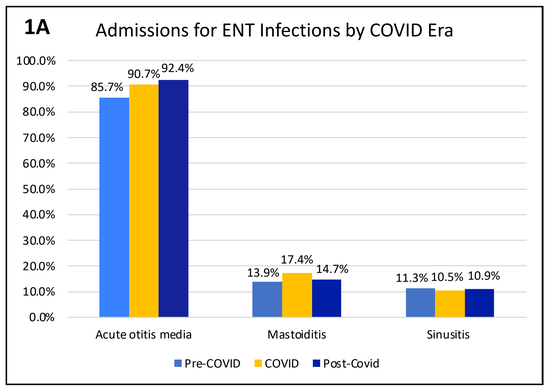
Methods

- An IRB (#97034) from the University of Kentucky was obtained
- We performed a retrospective chart review of pediatric patients who were admitted with intracranial infections, acute otitis media (AOM), mastoiditis, and sinusitis between May 1, 2013, and May 30, 2023.
- The COVID era was defined as March 11, 2020, through June 11, 2021.
- Patient demographics, need for intervention, and patient outcomes were reviewed in those with concurrent intracranial and otolaryngologic infection during pre-COVID, COVID, and post-COVID eras.
- Fisher's exact test was done to determine associations between patient factors and outcome measures.

Results

Table 1: Patient characteristics

Patient Characteristics	No. (%)
COVID ERA	
Pre-Covid	901 (57.6)
Acute Covid Era	86 (5.5)
Post-Covid	578 (36.9)
AGE	
Median (range)	2.0 (0-17)
GENDER	
Female	662 (42.3)
Male	903 (57.7)
RACE	
White	1,372 (87.7)
Black/African American	145 (9.3)
Asian	12 (0.8)
Hispanic/Latino	11 (0.7)
INSURANCE TYPE	
Medicaid	669 (43.2)
Medicaid Replacement	286 (18.5)
Blue Cross Blue Shield	121 (7.8)
Self-Pay	91 (5.9)
RURALITY	
Urban	637 (43.7)
Rural	255 (17.5)
Very Rural	566 (38.8)



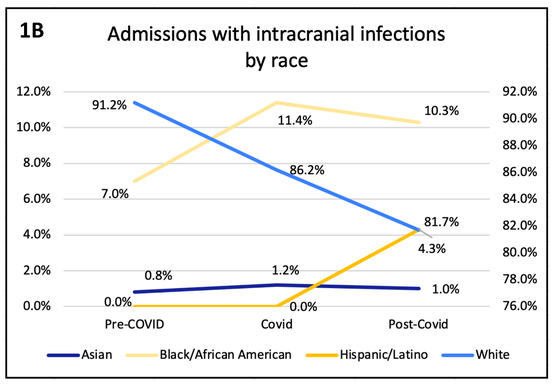


Figure 1 shows increased admission rates for otologic ENT infections in the COVID and post-COVID eras **(A)** and relative increase in Hispanic and African American patients with intracranial infections **(B)**.

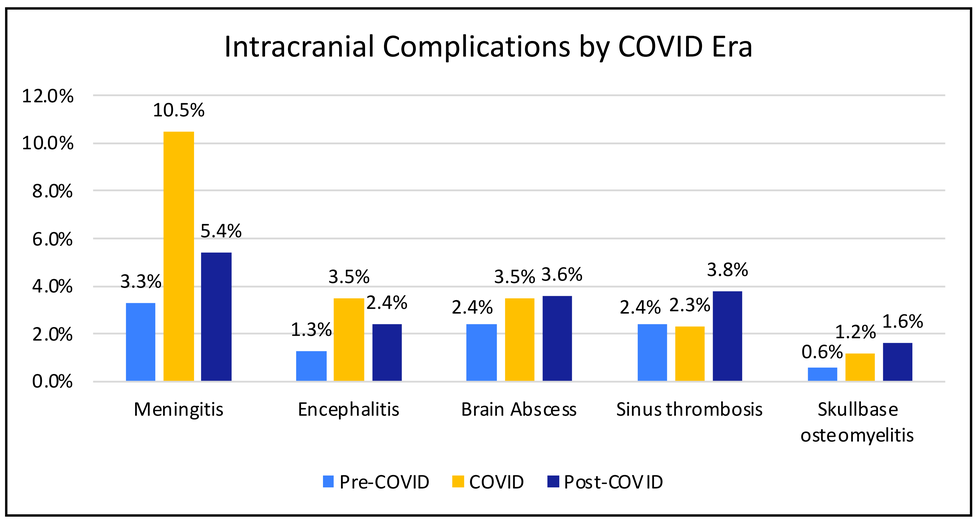


Figure 2: In patients admitted with otolaryngologic infections, there was an increased in intracranial complications during the COVID era and this trend persisted post-COVID.

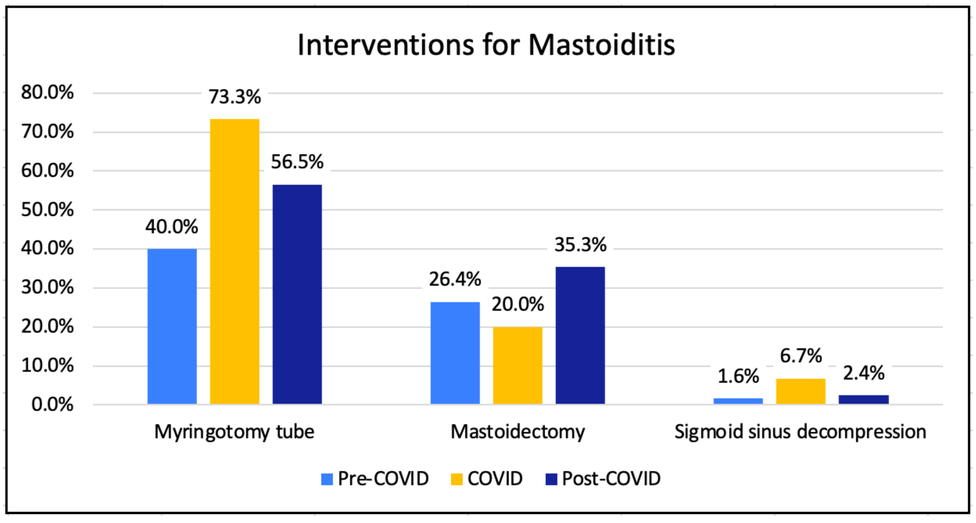


Figure 3: In patients admitted with mastoiditis, there were increased surgical interventions in the post-COVID era compared the the pre-COVID era.

Discussion

- In the post-COVID era, multiple studies have shown increased incidence of complications in otogenic and sinogenic infections in the pediatric population.[1,2]
- In the present study, there were increased admissions for AOM and mastoiditis in the COVID and post-COVID eras (Figure 1) and there were increased intracranial complications in patients admitted with AOM, mastoiditis, or sinusitis (Figure 2).
- In-hospital mortality increased during the COVID era but has remained higher in the post-COVID period (pre-COVID 0.3%, COVID 1.16%, post-COVID 0.86%)
- Patients requiring surgical intervention increased in the post-COVID era in otologic infections (Figure 3), but the rate of sinogenic intervention decreased (4.22% vs 3.63%).
- While this study showed increasing trends, these values did not reach statistical significance as it was limited in statistical power from the overall low occurrence of these complications.

Conclusions

- In our single institution retrospective review, there were increased rates of otolaryngologic complications by intracranial infections in the COVID and post-COVID eras.
- Otologic surgical interventions increased, but sinogenic intervention decreased.
- Further multivariate analysis is ongoing to determine variables associated with this increase in complicated pediatric otolaryngology infections and to determine any differences in socioeconomic factors associated with these findings.

References

1. Massimi, L., Cinalli, G., Frassanito, P., Arcangeli, V., Auer, C., Baro, V., ... & Tamburrini, G. (2024). Intracranial complications of sinogenic and otogenic infections in children: an ESPN survey on their occurrence in the pre-COVID and post-COVID era. Child's Nervous System, 40(4), 1221-1237.
2. Rosamilia G, Lee KH, Roy S, Hart C, Huang Z. Impact of COVID-19 on nationwide pediatric complicated sinusitis trends throughout 2018-2022. Am J Otolaryngol. 2023 Dec 17;45(2):104187. doi: 10.1016/j.amjoto.2023.104187. Epub ahead of print. PMID: 38134847.