

Acute Mastoiditis Incidence and Outcomes Pre and Post COVID-19

Lauren Sterlin, MS4, Kelley M. Dodson, MD, Arman Saeedi, MD

Department of Otolaryngology – Head & Neck Surgery, VCU, Richmond, VA



VCU Health™

Introduction

- Acute mastoiditis (AM) is an infectious process of the mastoid air cells that occurs due to acute, sub-acute or chronic otitis media infection [1]
- Current guidelines advocate for a conservative approach to treatment including antibiotics alone or antibiotics plus either tympanostomy or mastoidectomy [1]
- Since the COVID-19 pandemic, the incidence of AM has increased. It is thought that this is due to a general increase in viral respiratory infections and an insufficiently trained immune system [2]
- Untreated AM can be complicated by subperiosteal abscess, subdural abscess, facial nerve palsy, and labyrinthitis [3]
- The goal of this study was to analyze whether there was an increase of surgical treatment of AM after SARS-CoV-2 pandemic

Methods

- Two cohorts were created using data from TriNetX.
- Inclusion Criteria: Children (birth to 18 years of age) with AM
- Exclusion Criteria: neoplasm of the acoustic nerve, cholesteatoma, chronic mastoiditis, neurofibromatosis type 2 or neoplasms of cranial nerves
 - Any child with SARS-CoV-2 prior to AM diagnosis was also excluded in the post-pandemic group
- Index event was set to time of diagnosis of AM
- Main outcome measures were tympanostomy under general anesthesia and mastoidectomy within 90 days of diagnosis
- Cohorts were balanced using age, sex, race/ethnicity, and relevant comorbidities

Results

- Each cohort consisted of 1,557 patients after matching
- Cohort 1 was the pre-pandemic cohort, dates studied were 3/1/16 – 3/1/20
- Cohort 2 was the post-pandemic cohort, dates studied were 3/2/20 – 3/2/24
- Age at diagnosis was 4.66 ± 3.49 for Cohort 1 and 4.67 ± 3.62 for Cohort 2
- Treatment evaluated was either tympanostomy or mastoidectomy

Cohort	Total Patients in Cohort	Tympanostomy	
		Patients with Outcome	Risk
Pre-pandemic	1,557	158	0.101
Post-pandemic	1,557	242	0.155

Table 1: Tympanostomy outcomes for treatment of AM in pre and post COVID-19 pandemic cohorts

Cohort	Total Patients in Cohort	Mastoidectomy	
		Patients with Outcome	Risk
Pre-pandemic	1,557	34	0.022
Post-pandemic	1,557	63	0.04

Table 2: Mastoidectomy outcomes for treatment of AM in pre and post COVID-19 pandemic cohorts

- The risk for tympanostomy increased from 10.148% to 15.543% after the SARS-CoV-2 pandemic ($p < 0.0001$).
- The risk for mastoidectomy increased from 2.184% to 4.046% after the SARS-CoV-2 pandemic ($p = 0.0028$)

Discussion

- It has been noted that there has been an increase in the incidence of AM after the COVID-19 pandemic [2]
- Since the COVID-19 pandemic, surgical treatment approaches have also increased for both tympanostomy placement and mastoidectomy
 - The use of tympanostomy as a treatment for AM in the pediatric population has increased 0.65 times
 - The use of mastoidectomy as a treatment for AM in the pediatric population has increased 0.53 times
- Thus, along with an increase in the incidence of AM, there has been an increased need for surgical management as opposed to antibiotics alone
- Due to the increase of surgical treatment of AM, there is an increased probability of increased severity of AM in the pediatric population.
- Future studies can assess whether this was a short-term phenomenon, caused by decreased immunity from isolation or if this will be a long-lasting change for the treatment of AM

References

1. Sarno LD, Cammisa I, Curatola A, Pansini V, Eftimiadi G, Gatto A, Chiaretti A. A scoping review of the management of acute mastoiditis in children: What is the best approach? *Turk J Pediatr.* 2023;65(6):906-918. doi: 10.24953/turkjped.2023.320. PMID: 38204305.
2. Goldberg-Bockhorn E, Hurzlmeier C, Vahl JM, Stupp F, Janda A, von Baum H, Hoffmann TK. Increase in acute mastoiditis at the end of the COVID-19 pandemic. *Eur Arch Otorhinolaryngol.* 2024 Sep;281(9):4747-4756. doi: 10.1007/s00405-024-08704-y. Epub 2024 May 14. PMID: 38740579; PMCID: PMC11393142.
3. Cassano P, Ciprandi G, Passali D. Acute mastoiditis in children. *Acta Biomed.* 2020 Feb 17;91(1-S):54-59. doi: 10.23750/abm.v91i1-S.9259. PMID: 32073562; PMCID: PMC7947742.