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A retrospective analysis of pediatric sinusitis/mastoiditis/orbital cellulitis with surgically treated intracranial infections before, during and after the COVID-19 pandemic

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Keywords

Intracranial infection, COVID-19, sinusitis, pediatrics

Abstract

Background:

Central nervous system infections, like brain abscesses and subdural or epidural empyema, in pediatric patients are life-threatening and rapid treatment is necessary to prevent significant morbidity and mortality. Late into the COVID-19 pandemic, Oregon Health & Science University (OHSU)/Doernbecher Children's Hospital (DCH) hospitalized several pediatric patients with sinusitis and/or orbital cellulitis with intracranial infections including brain abscess and epidural or subdural empyema's. The goal of this study was to report our institutional experience with intracranial infections before and during the COVID-19 pandemic.

Methods:

A retrospective review of patients presenting with an intracranial infection at OHSU/DCH from 09/2015 to 12/2022 was conducted. Patients >28 days and <21 years-old at the time of surgical treatment were included, while those suspected to originate from an operative procedure, or a chronic immunosuppression were excluded.

Results:

Thirty-six patients with intracranial infections that required surgical intervention were identified. The median age was 9 years-old with a range of 1 month-old to 18 years-old. Common presenting symptoms were a fever (n=30, 80%), headaches (n=25, 69%) and mental status change (n=23, 64%). These patients were managed operatively with neurosurgery (n=32, 89%), otolaryngology (n=22, 61%) and ophthalmology (n=2, 6%). Cultures grew streptococcus (n=29, 80%), staphylococcus (n=4, 11%), or other (n=14, 39%) microorganisms. Most common residual symptoms included hemiplegia/paresis (n=11, 31%) while recurrence requiring reoperation occurred 17% (n=6). Pre-pandemic (2015-2019) average rate of infection was 4.2 (range 2-6) compared to post pandemic 5 (range 1-12). In 2022, the rate increased to n=12 which represents a 2.9x increase from the pre-covid average of 4.2 cases/year.

Conclusion:

Pediatric intracranial infections that require surgical intervention are rare. However, in 2022, we experienced an institutional increase of 2.9x the rate of pre-pandemic infections. This trend aligns with national incidence data reported by the Center for Disease Control in August 2022. Such a trend may be due to virulence changes in treatment-resistant *Streptococcus anginosus* or host immune factors secondary to isolation during the COVID pandemic.