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The impact of COVID-19 pandemic on acute otitis media among the pediatric population

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ABSTRACT

Background: The incidence of respiratory diseases has dropped during the school closures at the COVID-19 pandemic including acute otitis media (AOM) among the pediatric population.
Methods: This study included 2090 patients under 12 years old, that were diagnosed with AOM between March 2019 and February 2021 at the otolaryngology and pediatrics emergency room at a public tertiary hospital in Sao Paulo, Brazil.
Results: There was a significant drop in number of AOM cases diagnosed during the quarantine. The group before the pandemic represents 87,2% of the total attendings and the first two months of quarantine had the major attendance discrepancy between the same period during pre-pandemic times.
Conclusion: Quarantine isolation measures and school closures may have helped reduce not only the coronavirus spread but also other infectious diseases such as AOM among the pediatric population.

1. Introduction

An epidemic erupted in China at the end of 2019 and rapidly spread all overseas, 2020 was the year of the COVID-19 pandemic among the world [1]. In Sao Paulo, Brazil, March 24th of 2020 marked the quarantine measures implementation, closing daycares, schools, and non-essential businesses in the state and also the promotion of mask-wearing and hand washing to prevent the virus spread [2]. Since then, the number of emergency department visits among the pediatric population decreased significantly [3]. The precautions used to burden the coronavirus also affected other respiratory diseases, such as bronchiolitis [4] and other infectious diseases all over the world [5,6].

Acute otitis media (AOM) is one of the most common infectious diseases in the pediatric population, representing the first cause of antibiotics use in this population [7]. The majority of episodes occur concurrently with or soon after a viral upper respiratory tract infection (URI) [8].

During the pandemic, forced social isolation decreased various infectious diseases among the pediatric population, and this study aims to set the influence of these measures on AOM among the pediatric population.

2. Materials and methods

In this retrospective cohort study, we evaluated the number of emergencies attendings among pediatric patients at the Hospital Santa Casa de Misericordia de Sao Paulo, in Sao Paulo, Brazil, that were diagnosed with AOM.

Using ICD-10 codes H66.0 (Suppurative AOM) and H66.9 (Non specified otitis media) from our hospital database we identified the cases of AOM diagnosed at each period of time.

Inclusion criteria were patients under 12 years-old, who attended the otolaryngology or the pediatrics emergency room in the hospital from March 2019 to February 2021. All patients were examined by residents or professors from the pediatrics department or the otolaryngology department.

We analyzed data from March 2019 to February 2021 and divided patients into two groups by the period of time of attendance. Group 1 attendings occurred from March 2019 to February 2020, which represents the pre-pandemic group and Group 2 from March 2020 to February 2021.

We compared month by month the incidence of AOM in both groups and the total number of otolaryngology attendances in the emergency

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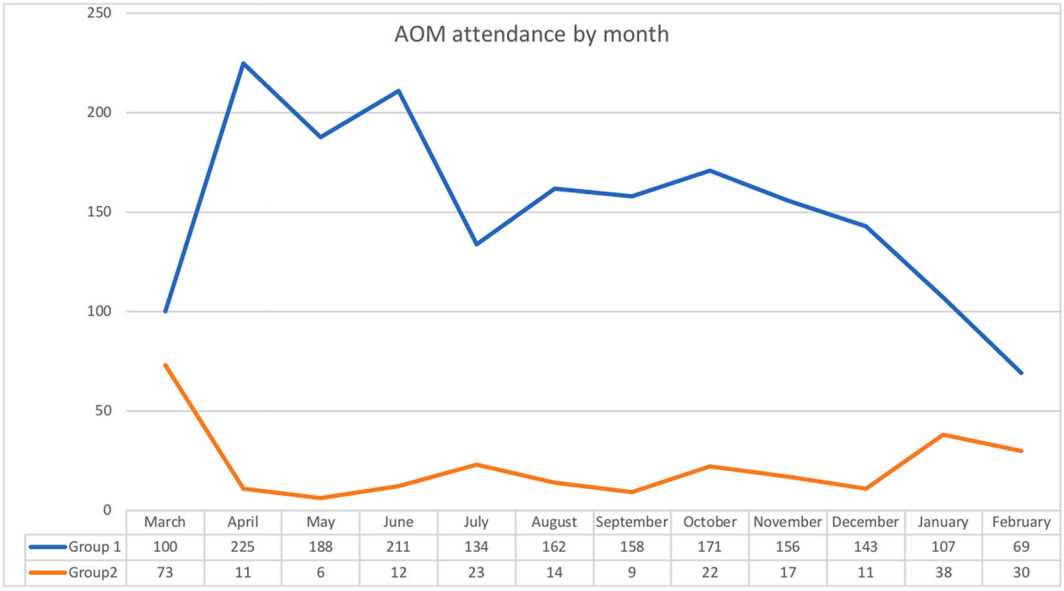
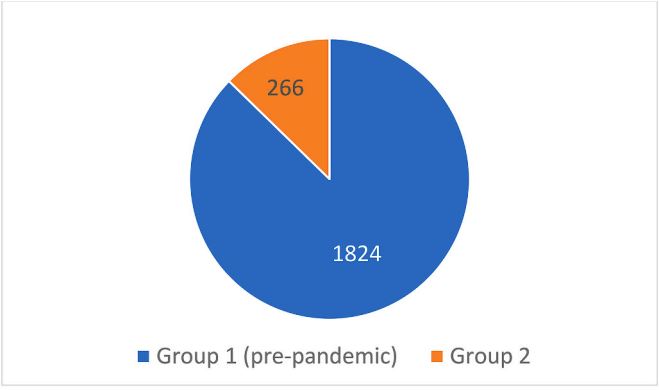
Table 1
Number of attendances month by month, pre-pandemic group (blue) and pandemic group (orange).



	March	April	May	June	July	August	September	October	November	December	January	February
Group 1	100	225	188	211	134	162	158	171	156	143	107	69
Group2	73	11	6	12	23	14	9	22	17	11	38	30

Table 2
Total number of AOM diagnosed patients from March 2019 to February 2021.



room at the same period of time from group 1 and group 2.

The results are given as absolute numbers and percentages, statistical analysis was calculated using the number of visits from each period of time then comparing the same period, with and without social distancing, to evaluate whether there was a reduction in the incidence of AOM in the pediatric population during the pandemic time.

This study does not contain personal or individual data, so it was considered exempt from evaluation by the Research Ethics Committee.

3. Results

A total of 2090 patients diagnosed with AOM under 12 years old were evaluated at the Pediatric and Otolaryngology emergency room between March 2019 and February 2021.

From March 2019 to February 2020 (group 1)- the period before the beginning of the COVID-19 pandemic and isolation implementation in Sao Paulo – a total of 1824 children were diagnosed with AOM and from March 2020 to February 2021 (group 2) only 266, divided month by month (Table 1), it represents 14.5% of the total cases, a 6.8 times less children (see Table 2).

In the meantime, the Otolaryngology emergency department reduced by half the number of total patient visits and the Pediatric department reduced to 40% when comparing the same period of time between groups 1 and 2.

May 2020 was the month with the largest comparative discrepancy between both groups: 30 times fewer children were diagnosed with AOM in group 2 than in group 1.

April and May 2020 were the months with the highest isolation rates in the city of Sao Paulo since the beginning of the quarantine in the state [9]. The major decrease in AOM cases coincided with the increase in isolation rates.

4. Discussion

World Health Organization (WHO) declared the coronavirus disease (COVID-19) outbreak on January 31st, 2020. Without any pharmaceutical intervention available for treatment, it has been supposed that the only strategy against COVID-19 was to reduce the mixing of susceptible and infectious people through early diagnosis of cases and social distancing interventions [10]. Following the trend, Brazil implemented national school closings by the end of March 2020. Since then, with schools and daycares closed, it was noteworthy that pediatric patients vanished from the clinics and the emergency care [11,12]. The incidence of AOM during the first two months of social isolation was the lowest of all periods, coinciding with the highest isolation rates of the population in Sao Paulo city [9].

Social distancing can have a substantial impact on the spread of various infectious diseases especially among children [13]. Influenza, other specified upper respiratory tract infections, and also otitis media had a major decline in a retrospective data analysis from U.S. pediatric Emergency Department visits during the pandemic period [6].

The drop in AOM cases were far sharper than the drop in total number of otolaryngology emergencies attended at the same period in our hospital. This reinforces that children attending day-care centers and school have a higher risk of acute respiratory infections compared with children cared at home [14]. Pediatric ED visits could be differentially affected relative to adult visits for a number of reasons, mainly because after a while, most adults had the need to leave home to perform their activities and work, while the schools were closed, most children

continued to stay home [6].

The main limitations of the present study are the lack of data from other hospitals and emergency departments to compare the decrease of AOM and other infectious diseases among the pediatric population and the fact that several measures such as mask-wearing and handwashing were promoted at the same period of time of social distancing, daycares closing, and virtual schooling.

5. Conclusions

In our study, we noticed a correlation between the reduction of the AOM diagnosis when comparing the same period of time - pre-pandemic and pandemic groups - and also correlated the increased isolation rates among the population and the higher drop of AOM cases. This study corroborates that social distancing is an effective measure to reduce not only COVID-19 spread but also other viral and bacterial diseases, especially among the pediatric population. Further studies are indicated to correlate the impact of face mask use, virtual schooling, and the incidence of AOM and other infectious diseases among the pediatric population.

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Ethics approval

This study does not contain personal or individual data, so it was considered exempt from evaluation by the Research Ethics Committee.

Declaration of competing interest

The authors have no conflict of interests.

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