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The effects of the COVID-19 pandemic on pediatric patients with otitis media with effusion

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Abstract

Otitis media with effusion (OME) is a frequently self-limiting middle ear fluid accumulation. During the COVID-19 pandemic, there was a decrease in patient referrals to pediatric Otorhinolaryngology (pENT) outpatient clinics. The aim of this study was to compare the patients who presented at our pENT outpatient clinic with OME during the pandemic with patients who presented during the equivalent period before the pandemic, and to investigate the effects of pandemic measures on OME. The study included patients aged 1-15 years who presented at the pENT Outpatient Clinic due to OME. Four groups were created based on the date of March 2020, when the first COVID-19 case was recorded in Turkey. The groups were formed as one for each year from March 2018 to March 2022. The total number of patients admitted to the pENT outpatient clinic was recorded. Group 1 (March 2018-March 2019) included 1338 patients diagnosed with OME, which constituted 12% of the total number of patients. Group 2 (March 2019- March 2020) included 1238 patients, Group 3 (March 2020-March 2021) 241 (8%), and Group 4 (March 2021-March 2022) 432 (9.4%). From this study, it was observed that the greater attention paid to the mask, social distance and hygiene rules during the COVID-19 pandemic, and the implementation of distance education decreased the frequency of upper respiratory tract infections, and had a positive effect on the number of OME cases.

Keywords: COVID-19, children, otitis media, effusion

1. Introduction

Otitis media with effusion (OME) is fluid accumulation in the middle ear, which is frequently self-limiting and has an acute or chronic pattern. The presence of effusion for a period of longer than three months is defined as chronic OME. Before the age of 10 years, an average of 80% of children experience an attack of OME at least once, and it is seen most often in the first two years of life (1, 2). OME is seen at the highest rate in childhood because the Eustachian tube is anatomically and functionally immature, and there is a higher rate of upper respiratory tract infections associated with exposure to viruses and bacteria at school and creche and the presence of adenoid hypertrophy. The persistence of OME for longer than three months despite treatment is a cause of hearing loss and a primary indication for the application of a ventilation tube (3).

During the COVID-19 pandemic, there was a great decrease in patients presenting at or being referred to paediatric Ear, Nose, and Throat (pENT) polyclinics because of OME (4). This can be attributed to a decrease in infections that can cause OME due to the closure of schools, creches, curfews, and instructions to stay at home.

This study aimed to investigate the effects of the COVID-19 pandemic precautions on OME by comparing patients who presented at the pENT polyclinic because of OME during the pandemic with patients who presented in the equivalent period before the pandemic.

2. Material and Method

Approval for the study was granted by the Ethics Committee of Ondokuz Mayıs University (decision no: KAEK 2022/213). The study included patients aged 1-15 who presented at the pENT of Samsun University Medical Faculty Hospital, a tertiary-level regional reference centre. The patients were separated into four-year groups, based on March 2020, when the first COVID-19 case was recorded in Turkey.

Group 1 (pre-pandemic) included patients diagnosed with OME between March 2018 and March 2019.

Group 2 (pre-pandemic) included patients diagnosed with OME between March 2019 and March 2020.

Group 3 (pandemic period) included patients diagnosed with OME between March 2020 and March 2021.

Group 4 (pandemic period) included patients diagnosed with OME between March 2021 and March 2022.

The diagnosis of OME was made in our clinic as stated in the international guidelines, from the presence of fluid in the middle ear, retracted tympanic membrane, air bubble, or the air-fluid level in the otoscopic examination, together with the presence of Type B curve in the tympanometric examination.

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The data of the patients diagnosed with OME in our clinic were retrieved from the hospital database and patient files. The total number of patients in the same age group who presented at the pENT for any reason in the same time periods was also recorded.

The study exclusion criteria were incomplete records, the presence of acute mastoiditis, cholesteatoma, cleft palate or lip, or any diagnosed syndrome or chronic disease.

The acoustic impedance measurements of the patients were taken using Interacoustics AZ26 and AT235H clinical tympanometry devices.

2.1. Statistical Analysis

Descriptive statistics were stated as number (n) and percentage (%) for categorical variables. The age distribution between the groups was evaluated with the Kruskal Wallis test, and the gender distribution with the Chi-square test.

3. Results

Group 1 (pre-pandemic: March 2018 - March 2019) included 1338 patients, comprising 792 (60%) males and 546 (40%) females. The patients diagnosed with OME constituted 12% of the total 10.810 presentations at the pENT in that period.

Group 2 (pre-pandemic: March 2019 - March 2020) included 1238 patients, comprising 768 (62%) males and 470 (38%) females. The patients diagnosed with OME constituted 11% of the total 10.728 presentations at the pENT in that period.

Group 3 (pandemic period: March 2020 - March 2021) included 241 patients, comprising 137 (56%) males and 104 (44%) females. The patients diagnosed with OME constituted 8% of the total 2905 presentations at the pENT in that period.

Group 4 (pandemic period: March 2021 - March 2022) included 432 patients, comprising 251 (58%) males and 181 (42%) females. The patients diagnosed with OME constituted 9.4% of the total 4571 presentations at the pENT in that period.

No difference was determined between the groups regarding age and gender distribution (Table 1).

During the COVID-19 pandemic, there was observed to be a significant decrease in the total number of patients and patients diagnosed with OME.

4. Discussion

From March 2020, when the World Health Organisation declared COVID-19 a global pandemic, there was an increase in COVID-19 case numbers, and a series of precautions were taken to restrict social life in Turkey, as throughout the world. In that period, due to greater attention given to hygiene rules, mask-wearing, social distancing, curfews and lockdowns, and the implementation of distance education, there was a decrease in upper respiratory tract infections and, therefore, hospital presentations because of OME (5). This study aimed to investigate the effects of the COVID-19 pandemic on OME by evaluating the patients diagnosed with OME in the pENT before and during the pandemic.

Table 1. Distribution of the demographic data according to the groups

		Group 1 (n=1338)	Group 2 (n=1238)	Group 3 (n=241)	Group 4 (n=432)	P
Age (years)		6.08±3.1 (min:1, max:15)	6.21±3.1 (min:1, max:15)	6.09±3.2 (min:1, max:15)	5.98±3.2 (min:1, max:15)	0.748¥
Gender	M	792 (59.2 %)	768 (62 %)	137 (56.8 %)	251 (58.1 %)	0.246β
	F	546 (40.8 %)	470 (38 %)	104 (43.2 %)	181 (41.9 %)	

The prevalence of OME is greater in younger children as the Eustachian tube has not reached full anatomic and functional maturity. Moreover, an increase in upper respiratory tract infections also increases the frequency of OME (1, 2). In England, it has been reported that OME is the most common reason in childhood for referral to a surgeon (6). In another study in England, the frequency of patients with OME consulting a general practitioner was reported to be 15.2% (7). In two different studies in Turkey, the OME frequency was reported as 8.7% and 6.8% (8, 9). The OME frequency in the current study was determined as 11% and 12% in the two years before the COVID-19 pandemic.

Studies in literature have reported that OME is seen more in males (3). Although the reason for this is not fully known, several hypotheses have been developed. Genetic factors, different effects of the sex hormone on cytokines, and impaired mastoid ventilation in males have been suggested as possible reasons (10-12). According to the gender distribution data of the current study, OME was observed more in males, which was consistent with the data in the literature.

Although tympanograms are an important diagnostic tool in diagnosing OME, false positivity has been reported at 8% in previous studies (13, 14). Therefore, in our clinic, the evaluations of all the patients diagnosed with OME are made with physical examination, tympanogram, and audiogram findings together.

In a study by Nguyen et al. (4), the numbers of patients diagnosed with OME before and during the COVID-19 pandemic were compared, and there was reported to be a 50% decrease. Alde et al. (15) examined 2-month periods before and during the pandemic (May-June 2019, January -February 2020, May-June 2020) to investigate the effects of the COVID-19 restrictions on OME. The tympanogram data (Type B) were determined as 46% and 52% and fell to 2.3% during the pandemic. In a study by Toretta et al. (5), the period of February-April was compared in 2019 and 2020, and there was shown to be a significant decrease in the number of OME attacks and the number of antibiotics prescribed. In the current study, the two years before the pandemic were evaluated separately, and the numbers of patients diagnosed with OME were determined to constitute 11% and 12%, respectively, of

the total patient numbers. The number of patients who presented during the pandemic significantly decreased, with an 80% decrease in the number of patients compared to the previous year. The total number of presentations revealed that the rate of OME was 8% during the COVID-19 pandemic.

It was observed that wearing masks, social distancing, greater attention paid to hygiene rules, and the implementation of distance education with a decrease in upper respiratory tract infections (5) positively affected the number of OME cases during the pandemic.

This study had some limitations, primarily that it was retrospective and was conducted in a single centre. It should also be considered that even if a child was ill at that time, overly cautious parents might have been hesitant to visit a hospital because of the fear of infection during the pandemic.

This study differs from previous similar studies as two years were evaluated before and during the pandemic. The number of patients and percentage of the total presentations in the second year of the pandemic (Group 4) were significantly low, showing that preventative measures such as mask-wearing and social distancing could play a preventive role in developing OME. In light of these findings, taking these protective measures in addition to treatment could positively contribute to the follow-up period in managing chronic OME.

Ethical Approval

Approval for the study was granted by the Ethics Committee of Ondokuz Mayıs University (decision no: KAEK 2022/213, dated: 27.04.2022).

Conflict of interest

The authors declared no conflict of interest.

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None to declare.

Authors' contributions

Concept, Design, Data Collection and processing, Analysis, and Interpretation (NFT)

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