Evolution of otitis media with effusion in the paediatric population of Hospital Beatriz Ângelo during COVID lockdown

Original Article

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Abstract

Objective: Description of the evolution of a paediatric population with surgical indication for Otitis Media with Effusion (OME) during the SARS-CoV-2 lockdown.
Study design: Observational retrospective study.
Material and Methods: During the pandemic period, in March 2021, we reassessed 21 children proposed for bilateral transtympanic tube placement and adenoidectomy in the last quarters of 2019 and 2020. We evaluated the symptoms, otoscopy and tympanometry, comparing with the results that led to the surgical indication previously.
Results: 76% showed improvement in otoscopy and only 4.7% (n=1) showed worsening in otoscopy. Regarding the tympanogram, there was a decrease from 62% to 5% of patients with type B and an increase of type A from 0% to 81%. No patient observed had Acute Otitis Media in the previous 6 months.
Conclusions: Social confinement led to an improvement in the patients with OME, increasing the possibility of cure without the need for surgery.
Keywords: Otitis Media with Effusion; COVID-19; Lockdown; Pandemic

Introduction

Chronic otitis media with effusion (OME) is an inflammatory disease characterized by the persistent accumulation of mucus in the middle ear for more than 12 weeks. It is one of the most common diseases among children and is the main cause of conductive hypoacusis in this age group, leading to delayed speech development, behavior disorders, and poor school performance.[1] The risk factors for this disease include age, because of the horizontal position of the Eustachian tube and hypertrophy of the lymphoid tissue in children, as well as prematurity, low birth weight, Down syndrome, cleft palate and other craniofacial abnormalities, genetic predisposition (19q and

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10q, 17q12, FBXO11 polymorphism), day care attendance, and use of pacifier. Breastfeeding is considered a protective factor.[2]

The consequences of this entity are not just limited to the clinical and therapeutic context, but also have an impact on the children's quality of life, development, and learning, as well as financial costs.[3]

The diagnosis is based on a type B tympanogram and otoscopic evidence of the disease.[2] The most agreed upon treatment is myringotomy with tympanostomy tube insertion, which is the most frequently performed surgical procedure in otorhinolaryngology. This procedure aims to drain the mucus and oxygenate the middle ear.[1] The guidelines of the American Academy of Otolaryngology-Head and Neck Surgery for the insertion of tympanostomy tubes were updated in 2022. These guidelines provide a reference for the clinical management of OME in children.[2] However, these guidelines do not address issues such as isolation and school non-attendance.[2,4]

In 2020, as a result of the COVID-19 pandemic in Portugal, the first lockdown was imposed from March to May 2020 and with a new surge in cases, a second one occurred from January to March 2021.

The objective of this study was to assess the role of social isolation due to the COVID-19 pandemic in the natural history of OME in pediatric patients on the waiting list for surgery (myringotomy with tympanostomy tube insertion and adenoidectomy) at the Beatriz Ângelo Hospital.

Materials and Methods

This was an observational retrospective study in which the waiting list for surgery at the department of Otorhinolaryngology and Head and Neck Surgery of the Beatriz Ângelo Hospital was reviewed. The pediatric patients who were selected for bilateral myringotomy with tympanostomy tube insertion and adenoidectomy (performed by different surgeons) for OME between September and December 2019, and between September and December 2020 (N=52) were re-evaluated during the second lockdown in Portugal in March 2021. The period in 2020 was selected because it was immediately after the lockdown when the children were not in isolation. The last four-month period of 2019 was chosen because it was just before the start of the COVID-19 pandemic and corresponded to the period in 2020. Thus, the patients underwent diagnostic assessment and were put on the waiting list for surgery at the same time of the year and were re-evaluated during lockdown.

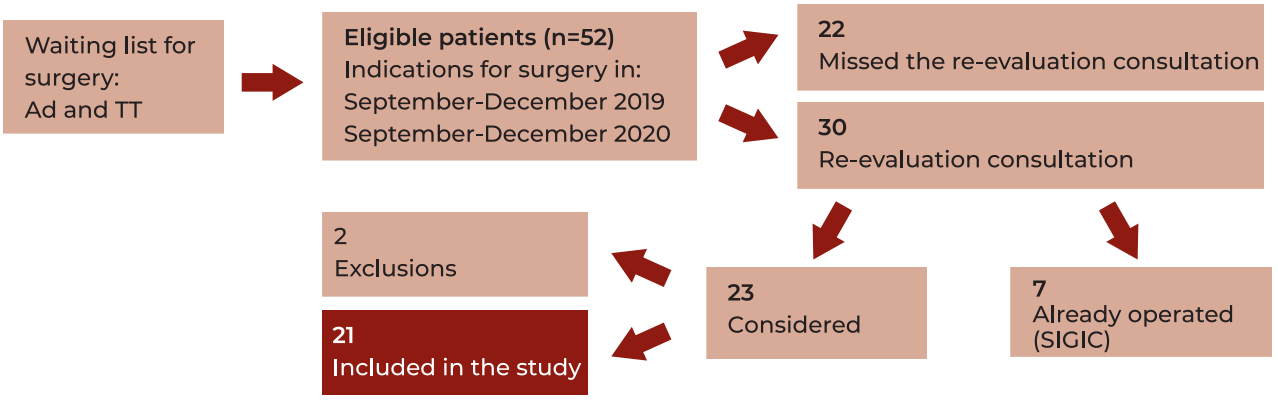
Thirty of the 52 recruited patients showed up for consultation and seven of these had already been operated on through the surgery-voucher under the program of the Integrated System of Surgery Applicants Management (Sistema Integrado de Gestão de Inscritos para Cirurgia - SIGIC).

The exclusion criteria were as follows: aged 18 years or more, prematurity, low birth weight, Down syndrome, cleft palate and other craniofacial anomalies, and children who continued to attend school. Thus, two children were excluded because they were the daughters of healthcare professionals and continued to attend school.

Data from the remaining 21 patients were collected during the re-evaluation consultation, including complete clinical history, complete objective examination with bilateral otoscopy, tympanometry, and review of the electronic clinical records.

The patients were evaluated for the following variables: we asked the parents if they thought the symptoms had improved, worsened, or stabilized (delayed speech, hypoacusis, otalgia, otorrhea, nasal congestion); frequency of acute otitis media (AOM); on otoscopy , OME was considered if there was retraction, opacity, or perforation of the tympanic membrane; hydroaeric levels, horizontalization, or hypervascularization of the handle of the malleus; blue ear drum; hypervascularization of the tympanic annulus; and tympanometry (type A, B, or C). These variables were then compared with the results that led to the surgical indication. All evaluations

Figure 1
Diagram of patient selection for the study



were performed and described by a single investigator. The criteria for improvement of OME were based on three variants: parents' perception – if they reported an improvement of the initially mentioned nasal, otologic, or speech complaints at the time of the surgical proposal; otoscopy – normal findings; and tympanogram – improvement in the tympanometric curve.

Results

Of the 21 assessed patients (12 boys and nine girls), 76% exhibited an improvement on ear examination and only 4.7% (n=1) had worsened, with perforation of the tympanic membrane in a patient who previously only had tympanic retraction. With regard to the complaints of nasal congestion and delayed speech development, which were merely subjective complaints of the parents, there was an improvement in 54.5% and 50% of patients, respectively, and worsening in 0% of patients. With regard to the symptoms, no patient had OME in the last six months.

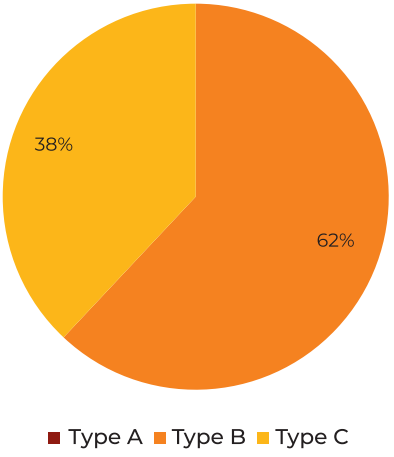
With regard to the tympanograms performed before the lockdown, 62% and 38% of the study population had type B and type C tympanograms, respectively. No child had a type A tympanogram. However, in our re-evaluation during the lockdown, 81% of cases had a type A tympanogram, 14% exhibited a type C tympanogram, and 5% had a type B tympanogram. Moreover, 86% of the patients had improved and the three patients whose tympanogram did not improve remained stable and did not get worse.

Thus, considering the type B or type C tympanogram along with complaints from the parents or otoscopy findings being compatible with OME, 90.5% of patients no longer had a surgical indication for bilateral myringotomy with tympanostomy tube insertion, and only 9.5% (N=2) had an indication for surgery.

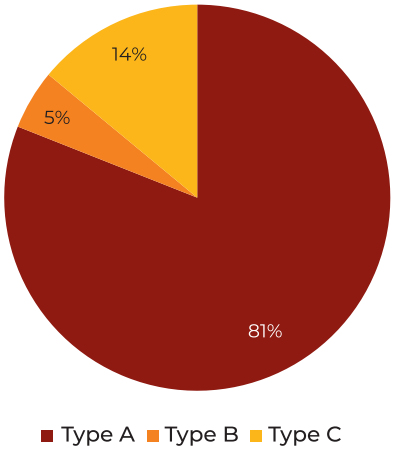
Discussion

In 2020, the COVID-19 pandemic was declared a public health emergency by the World Health Organization (WHO). Therefore, most countries implemented restrictive measures intending to contain the pandemic, including the use of masks and social distancing.[5] In Portugal there were two lockdown periods

Graph 1
Distribution of the three types of tympanograms in the study population before the lockdown



Graph 2
Distribution of the three types of tympanograms in the study population during the lockdown



with closure of schools, one from March to May 2020 and the other from January to March 2021.

The present study is the first to focus on the prevalence of OME during the COVID-19 lockdown in Portugal. In the re-evaluation consultation, we found that there was a significant change in the tympanometric pattern, along with an improvement in the complaints reported by parents and the results of the ear examination. Thus, there was a clinical improvement in OME in these patients, with a reduction in AOMs and prevalence of OME, as well as a reduction in surgical indications.

We observed that social isolation and hygiene measures (minimum social distance of 2 m, use of facial masks, and reinforcement of hand sanitizing) were associated with an improvement in the symptoms of OME. The probable cause was the closure of schools, which led to a reduction in infections of the upper airways (adenoiditis) and subsequent improvement of middle ear ventilation, as demonstrated by the Austrian study by Redlberger-Fritz *et al.*[6] The wearing of masks in this age group had a lesser role due to non-compliance. In this sense, children who continued attending classroom teaching were excluded from this study.

Studies conducted in Europe have already been published that focused on the evolution of OME during the COVID-19 pandemic lockdown. Toretta *et al.* showed that the lockdown had a positive impact on the treatment and prevention of OME.[7-9] However, the majority of the published articles are retrospective studies with small samples and lacked control groups because they were conducted during the lockdown.[1,7,10] In addition to these limitations, the present study did not use questionnaires validated in Portuguese for investigating the progression of symptoms. Furthermore, the assessment of patients in the pre-COVID-19 period was performed by different physicians. Therefore, it is difficult to draw general conclusions about a direct relationship between the lockdown and control of OME; however, we believe it is important to disseminate the results of this observational study which was conducted under the specific conditions of the COVID-19 lockdown.

Conclusion

There was an overall improvement in OME in our sample of children during social isolation. Approximately 90% of these children were cured and did not need surgical treatment. This finding is in line with those reported in the published literature and highlights the role of the factors that determine the non-surgical resolution of childhood chronic OME, such as environmental control (not attending school for a specific time period). However, prospective studies with control groups should be conducted to allow more reliable conclusions.

Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

Data Confidentiality

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

Protection of humans and animals

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the 2013 Helsinki Declaration of the World Medical Association.

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Availability of scientific data

There are no datasets available, publicly related to this work.

Bibliographic references

1.Aldè M, Di Berardino F, Marchisio P, Cantarella G, Ambrosetti U, Consonni D. et al. Effects of COVID-19 lockdown on otitis media with effusion in children: future therapeutic implications. Otolaryngol Head Neck Surg. 2021 Nov;165(5):710-715. doi: 10.1177/0194599820987458.

2.Rosenfeld RM, Shin JJ, Schwartz SR, Coggins R, Gagnon L, Hackell JM. et al. Clinical practice guideline: otitis media with effusion (update). Otolaryngol Head Neck Surg. 2016 Feb;154(1 Suppl):S1-S41. doi: 10.1177/0194599815623467.

3.Poss JM, Boseley ME, Crawford JV. Pacific Northwest survey: posttympanostomy tube water precautions. Arch Otolaryngol Head Neck Surg. 2008 Feb;134(2):133-5. doi: 10.1001/archoto.2007.25.

4.Gelardi M, Giancaspro R, Fiore V, Fortunato F, Cassano M. COVID-19: Effects of lockdown on adenotonsillar hypertrophy and related diseases in children. Int J Pediatr Otorhinolaryngol. 2020 Nov;138:110284. doi: 10.1016/j.ijporl.2020.110284.

5.WHO Director-General's opening remarks at the media briefing on COVID-19. 2020. World Healh Organization. [Internet] [Accessed 2022 Jan 14] Available from: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

6.Redlberger-Fritz M, Kundi M, Aberle SW, Puchhammer-Stöckl E. Significant impact of nationwide SARS-CoV-2 lockdown measures on the circulation of other respiratory virus infections in Austria. J Clin Virol. 2021 Apr;137:104795. doi: 10.1016/j.jcv.2021.104795.

7.Torretta S, Capaccio P, Coro I, Bosis S, Pace ME, Bosi P. et al. Incidental lowering of otitis-media complaints in otitis-prone children during COVID-19 pandemic: not all evil comes to hurt. Eur J Pediatr. 2021 Feb;180(2):649-652. doi: 10.1007/s00431-020-03747-9.

8.Torretta S, Cantoni B, Bertolozzi G, Capaccio P, Milani GP, Pignataro L. et al. Has otitis media disappeared during COVID-19 pandemic? A fortuitus effect of domestic confinement. J Clin Med. 2021 Jun 27;10(13):2851. doi: 10.3390/jcm10132851.

9.Torretta S, Capaccio P, Gaffuri M, Gaini LM, Borin M, Maruca A. et al. ENT management of children with adenotonsillar disease during COVID-19 pandemic. Ready to start again? Int J Pediatr Otorhinolaryngol. 2020 Nov;138:110145. doi: 10.1016/j.ijporl.2020.110145.

10.Iannella G, Magliulo G, Lechien JR, Maniaci A, Perrone T, Frasconi PC. et al. Impact of COVID-19 pandemic on the incidence of otitis media with effusion in adults and children: a multicenter study. Eur Arch Otorhinolaryngol. 2022 May;279(5):2383-2389. doi: 10.1007/s00405-021-06958-4.

11.Angoulvant F, Ouldali N, Yang DD, Filser M, Gajdos V, Rybak A. et al. Coronavirus disease 2019 pandemic: impact caused by school closure and national lockdown on pediatric visits and admissions for viral and nonviral infections - a time series analysis. Clin Infect Dis. 2021 Jan 27;72(2):319-322. doi: 10.1093/cid/ciaa710.