



Incidental lowering of otitis-media complaints in otitis-prone children during COVID-19 pandemic: not all evil comes to hurt

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Abstract

Given COVID-19 pandemic periodic outpatient assessment of otitis-prone children regularly followed at our tertiary outpatient clinic of upper respiratory tract infections was discontinued since 9 March. In order to avoid leaving the patients to themselves just during the winter months, which are the most critical ones for these children, we kept in touch with the families of 102 children (mean age 41.4 ± 14.0 months) who had had a follow-up visit scheduled during the lockdown, and compensated with telemedicine assessment. This incidentally leads to the unexpected but not at all negative finding that a consistent clinical improvement had been occurred in most (82.3%) of children. A statistically significant reduction in the mean number of documented acute otitis media episodes, otorrhea episodes, and systemic antibiotic treatments during the February–April 2020 period compared with February–April 2019 was attested. Clinical evaluation performed in 27.4% cases revealed normal middle ear findings in all but three (89.3%) children.

Conclusion: Our data document a global improvement of otitis-prone children in Milan during the Italian lockdown, as a fortuitous and incidental positive effect of the national lockdown.

What is Known:

- During COVID-19 pandemic in Italy any non-urgent medical activity including periodic outpatient assessment of otitis-prone children was discontinued.
- Otitis-prone children experience acute infectious exacerbations mainly in winter.

What is New:

- Most of children reached by means of a telemedicine assessment during lockdown experienced a subjective clinical improvement; clinical assessment at the end of the lockdown revealed normal otoscopic findings in most cases.
- Exceptional circumstances during COVID-19 pandemic had a fortuitous positive effect on otitis-prone children's clinical conditions.

Keywords Otitis media · Children · Otitis-prone · COVID-19 · Infection

Abbreviations

COVID-19 Coronavirus 2019 disease
OPC Otitis-prone children

RAOM Recurrent acute otitis media
CURTI Outpatient clinic of upper respiratory tract infections

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AOMsTMP Acute otitis media without spontaneous tympanic membrane perforation.

Introduction

The stunning diffusion of COVID-19 from our region placed at the epicentre of the Italian epidemic at the end of February 2020 brought us to stop any elective medical activities except for those related to emergency [1]. Periodic outpatient assessment of otitis-prone children (OPC) (i.e. with a history of recurrent acute otitis media—RAOM—defined as ≥ 3 distinct episodes in a 6 months, or ≥ 4 in 12 months) [2] who were regularly followed at our tertiary outpatient clinic of upper respiratory tract infections (CURTI) was discontinued since 9 March.

In order to avoid leaving the patients to themselves just during the winter months, which are the most critical ones for OPC, we kept in touch with their families and compensated with telemedicine assessment. This incidentally leads to unexpected but not at all negative findings.

Material and methods

Family of OPC scheduled for periodic evaluation between 9 March and 17 May were reached by a telephone call performed by resident physicians on 12–19 May. In some children a complete paediatric evaluation with pneumatic otoscopy [3] was executed on 18–19 May. The mean number of episodes of acute otitis media without spontaneous tympanic membrane perforation (AOMsTMP) and otorrhea episodes [4], as well as the number of systemic antibiotic treatments administered in the February–April 2020 period was recorded and compared with the corresponding ones in the February–April 2019 period (data available from children's medical records).

Parents were asked to give a subjective opinion about children's clinical conditions (improved, stable, got worse) during the lockdown. On the basis of information achieved, resident physicians gave indication to perform an urgent visit just at the end of the lockdown, a programmable visit, a visit only in case of needing.

The statistical analysis was mainly designed to detect any possible difference in the number of documented infectious recurrences (number of AOMsTMP and otorrhea episodes and number of systemic antibiotic treatments) between the two periods. The results are given as absolute numbers and percentages, or arithmetical mean values \pm standard deviation. Continuous variables were analysed using the Wilcoxon-signed rank sum test. The data were analysed using STATA 10.0 software (StataCorp, College Station, TX, USA); a $p < 0.05$ was considered statistically significant.

The protocol was approved by our local Ethics Committee of our hospital and was conducted in accordance with the

principles of good clinical practice. Written informed consent was achieved by the children's parents.

Results

Among 102 children (50% males; mean age 41.4 ± 14.0 months) scheduled for a follow-up visit during the lockdown 30.4% had a history of RAOM without spontaneous tympanic membrane perforation, and 69.6% of RAOM with spontaneous tympanic membrane perforations occurring in \geq two thirds of the episodes [4] (Table 1).

Most of parents (82.3%) declared that children had improved during the lockdown, and 16.7% that children were stable; only in one case (1%) parents considered clinical conditions of the child getting worse. We documented a statistically significant reduction in the mean number of: episodes of AOMsTMP, otorrhea episodes, and systemic antibiotic treatments during the February–April 2020 period compared with February–April 2019 (Table 1).

Clinical evaluation performed in 27.4% cases revealed normal middle ear findings in all but three (89.3%) children; middle ear effusion as previously defined [5] was detected in the remaining children (10.7%).

Resident physicians gave indication to non-urgent programmable clinical evaluation in 86.3% cases and clinical evaluation to be performed only in case of needing in the remaining children (13.7%).

Discussion

Our data document a global improvement of OPC in Milan during the Italian lockdown, attested by a significant reduction in the mean number of episodes of AOMsTMP, otorrhea episodes, and number of antibiotic treatments. This positive trend was confirmed by the parents' subjective judgment, as most of them considered their child clinically improved during the lockdown. Among 28 children who were evaluated just at the end of the lockdown, a complete recovery with normal otoscopic findings was detected in about 90% of cases. AOM is a widespread and multi-factorial disease, with RAOM mainly affecting males attending day-care, expose to second/third-hand smoke, having older siblings and a positive familiar history of allergy [6–11]. Brief or no breast-feeding, prematurity, the use of pacifier and push-and-pull bottles, air pollution are other predisposing factors [7–11].

Despite temporary restriction in day-care attendance has been proven to partially reduce the number of acute exacerbations [9, 10], this alone cannot completely change the natural history of disease.

It is well known that RAOM has a natural tendency to improve with increasing age of the child [12–17]. As a fact,

Table 1 Demographic and clinical characteristics of the patients and comparison between periods in terms of number of episodes of acute otitis media (AOM) without spontaneous tympanic membrane perforation, otorrhea episodes, and antibiotic treatments (SD: standard deviation).

Characteristics	Number (%)		
Mean age (SD), months	41.4 (14.0)		
Males	51 (50.0%)		
Prematurity	5 (4.9)		
Low weight at birth	3 (2.9)		
Breast-feeding	82 (80.4)		
Older siblings	54 (52.3)		
Order of geniture	1st	48 (47.1)	
	2nd	48 (47.1)	
	3rd	6 (5.8)	
Use of pacifier	41 (40.2)		
Use of push-and-pull bottle	36 (37.5)		
Second/third smoke exposure	28 (27.7)		
Familiarity for allergy	50 (49.5)		
Increased IgE levels	34 (38.2)		
Immunological defect	6 (6.5)		
Day-care attendance	102 (100)		
Adenoidal disease	14 (13.7)		
Hexavalent-vaccination	102 (100)		
Anti-pneumococcal vaccination	102 (100)		
Flu vaccination (winter 2019–2020)	60 (60.6)		
Comparison between periods	February–April 2019	February–April 2020	<i>p</i> value
Mean no. of AOM episodes/month (SD)	0.37 (0.64)	0.07 (0.35)	< 0.001
Mean no. of otorrhea episodes/month (SD)	0.48 (0.80)	0.01 (0.09)	< 0.001
Mean no. of antibiotics/month (SD)	0.85 (0.88)	0.09 (0.38)	< 0.001

Rosenfeld et al. [13] in their systematic literature review and metanalysis attested that only 17% of OPC remained classified like this and even that 41% did not experience any further AOM episode during a median observation period of 6 months (range 10 weeks to 2 years). The authors [13] also reported that the mean baseline rate of AOM recurrence was at least 0.46 episodes per patient/month with a cumulative recurrence rate of 0.23 (95% CI 0.18–0.28) AOM episodes per patient/month during the study period.

Even if our study has some limitations (i.e. the retrospective nature and the lack of a control group) mainly due to the fact that it was performed during the Italia lockdown for the COVID-19 pandemic, even considering that the natural history of RAOM tends to spontaneous resolution, the reduction in the mean number of AOM episodes per patient/month here documented appears to be more consistent than that generally reported by literature [12, 13, 15–17].

Under these circumstances, the significant improvement here attested could be considered an incidental positive effect of the national lockdown: exceptional circumstances during COVID-19 pandemic totally modified not only OPC way of living, but subvert social habits at their foundation with confinement of people in their own home. Abolition of any contact of OPC with environment and people other than the ones

strictly belonging to the domestic setting, rather than avoidance of the sole inter-personal contacts between children at day-care could be responsible for this result; reduction in air pollution in our metropolitan city during the lockdown could also partially account for it.

Reassessment of the patients during the next winter season would be useful to verify this supposition.

Authors' contributions ST: writing and data analysis;

PC: helping in drafting the paper and revising it;

LP: helping in drafting the paper and revising it;

IC: data collection;

SB: data collection;

MEP: data collection;

PT: data collection;

PM: conception of the work and revising the paper.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval The protocol was approved by our local Ethics Committee of our hospital.

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