Incidental Lowering of Otitis-media Complaints in Otitis-prone Children During COVID-19 Pandemic: Not All Evil Comes to Hurt

Sara Torretta (✉ sara.torretta@gmail.com)
University of Milan

Pasquale Capaccio
University of Milan

Ilaria Coro
University of Milan

Samantha Bosis
Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico

Elisabetta Pace
University of Milan

Pietro Tosi
University of Milan

Lorenzo Pignataro
University of Milan

Paola Marchisio
University of Milan

Short Report

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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 March 9th. 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 lead 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 to 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.

Key Points

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.

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 $\geq 3$ distinct episodes in a 6 months, or $\geq 4$ in 12 months) [2] who were regularly followed at our tertiary outpatient clinic of upper respiratory tract infections (CURTI) was discontinued since March 9th.

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 lead to unexpected but not at all negative findings...

**Materials And Methods**

Family of OPC scheduled for periodic evaluation between March 9th-May 17th were reached by a telephone call performed by resident physicians on May 12nd-19th. In some children a complete pediatric evaluation with pneumatic otoscopy [3] was executed on May 18th-19th. 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 were 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 using the Wilcoxon-signed rank sum test. The data were analysed using STATA 10.0 software (StataCorp, College Station, TX, USA); a p-value of $<0.05$ 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 to 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 perform 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.

The significant improvement here documented is 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.

**Abbreviations**

COVID-19: Coronavirus 2019 disease;

OPC: otitis-prone children;

RAOM: recurrent acute otitis media;
CURTI: outpatient clinic of upper respiratory tract infections

AOMsTMP: acute otitis media without spontaneous tympanic membrane perforation.

Declarations

Authors contribution:

ST (sara.torretta@unimi.it): writing and data analysis;

PC (pasquale.capaccio@unimi.it), LP (lorenzo.pignataro@unimi.it): helping in drafting the paper and revising it;

IC (ilaria.coro@policlinico.mi.it), SB (samantha.bosis@policlinico.mi.it), EP (elisabetta.pace@unimi.it), PT (pietro.tosi@unimi.it): data collection;

PM (paola.marchisio@unimi.it): 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

Funding: There is no founding source

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

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Tables

**Table:** 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).
| CHARACTERISTIC                              | N. (%)         |
|--------------------------------------------|----------------|
| 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                          |                |
| 1<sup>st</sup>                              | 48 (47.1)      |
| 2<sup>nd</sup>                              | 48 (47.1)      |
| 3<sup>rd</sup>                              | 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 | p-value |
|---------------------------|----------------------|----------------------|---------|
| Mean n. of AOM episodes (SD) | 0.37 (0.64)          | 0.07 (0.35)          | < 0.001 |
| Mean n. of otorrhea episodes (SD) | 0.48 (0.80)          | 0.01 (0.09)          | < 0.001 |
| Mean n. of antibiotics (SD) | 0.85 (0.88)          | 0.09 (0.38)          | < 0.001 |