Letters

RESEARCH LETTER

Otolaryngologic Manifestations in Pediatric Inflammatory Multisystem Syndrome Temporally Associated With COVID-19

As a consequence of increasing reports of an unusual and novel presentation of a multisystem inflammatory disease in the UK, the Royal College of Paediatrics and Child Health published a case definition on May 1, 2020, of pediatric inflammatory multisystem syndrome temporally associated with coronavirus disease 2019 (COVID-19) (PIMS-TS).[1] They defined PIMS-TS as persistent fever, inflammation, and evidence of single or multiorgan dysfunction, with exclusion of any other microbial cause and with positive or negative severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) polymerase chain reaction test results. In the US, this condition has been defined

Figure. Heat Map of the Rates of Initial Otolaryngologic Manifestations of Pediatric Inflammatory Multisystem Syndrome Temporally Associated With COVID-19 in the Total Cohort and by Intubated, Nonintubated, Pediatric Intensive Care Unit (PICU), and Non-PICU Subgroups

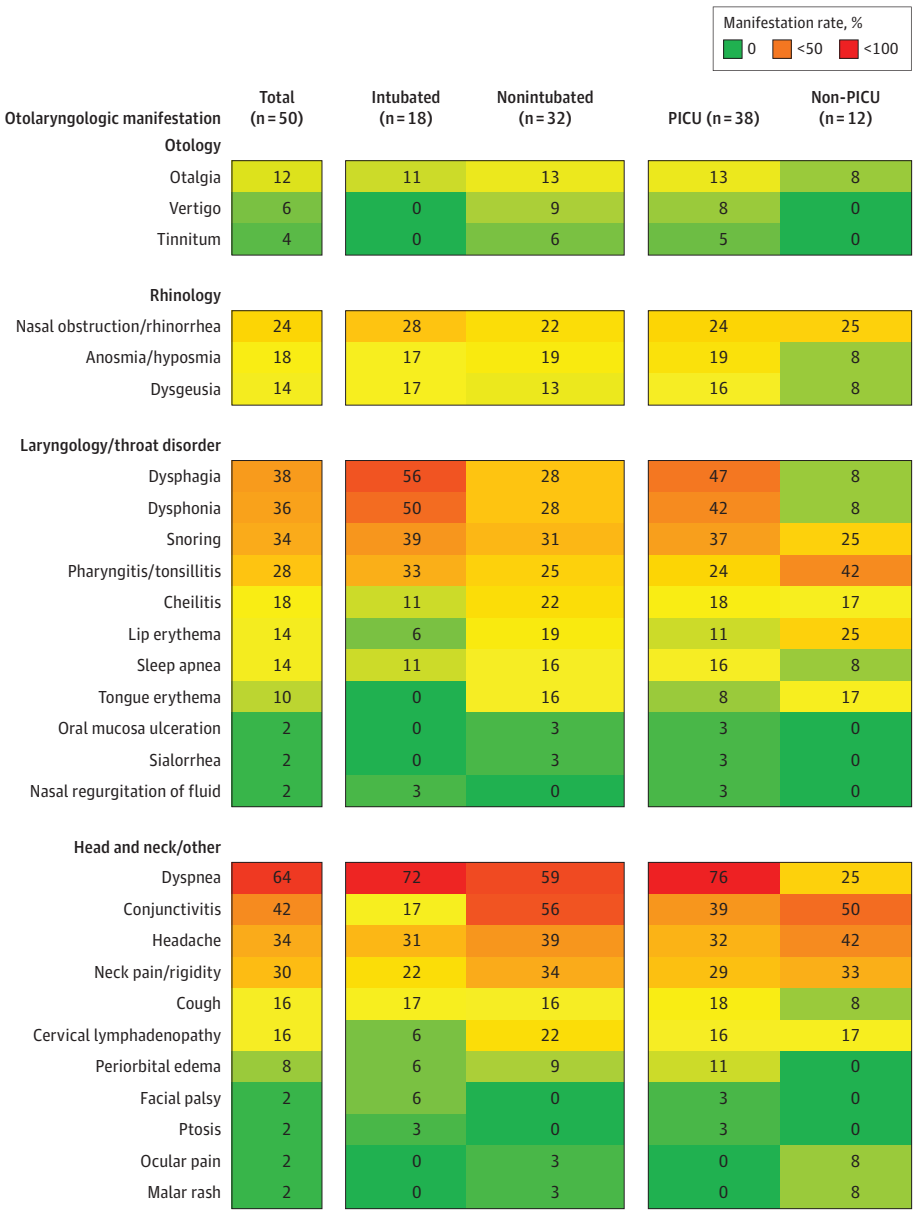

Table. Data on Otolaryngologic Investigations and Management Rates of the Total PIMS-TS Cohort

Otolaryngologic investigation and management	No. (%) of patients (n = 50)
Voice	
Reviewed in pediatric voice multidisciplinary team clinic	8 (16)
Ongoing voice therapy for dysphonia	5 (10)
Flexible nasendoscopy findings	
Postinflammatory changes of laryngeal mucosa	3 (6)
Unilateral vocal cord palsy	2 (4)
Weakness of bilateral vocal cords and laryngeal muscles	1 (2)
Unilateral atrophic vocal cord	1 (2)
Bilateral anterior one-third vocal cord pachydermic lesions	1 (2)
Bilateral congested nasal mucosa	1 (2)
Laryngeal electromyography and injection laryngoplasty for unilateral vocal cord palsy	1 (2)
Swallowing	
Ongoing swallowing therapy for dysphagia	3 (6)
VFSS at initial presentation and follow-up with oropharyngeal incoordination and weakness	2 (4)
FEES at follow-up with residual thickened fluids coating of piriform fossa and pharynx	1 (2)
Smell and taste	
Intranasal corticosteroids for 14 d for anosmia/hyposmia and dysgeusia persisting more than 6 wk with resulting improvement	4 (8)
MRI of the head for anosmia/hyposmia and dysgeusia persisting more than 6 wk with no specific findings to account for these symptoms	3 (6)

Abbreviations: FEES, fiberoptic endoscopic evaluation of swallowing; MRI, magnetic resonance imaging; PIMS-TS, pediatric inflammatory multisystem syndrome temporally associated with COVID-19; VFSS, videofluoroscopic swallow study.

by the Centers for Disease Control and Prevention as multisystem inflammatory syndrome in children, with a more specific case definition.[2]

Methods | This was a single-center exploratory observational cohort study focusing on otolaryngologic manifestations of children 18 years or younger presenting through a quaternary children's hospital PIMS-TS multidisciplinary team between April 1 and June 22, 2020, who met the case definition for PIMS-TS.[1] This study was classified as a quality-improvement project by the Clinical Research Adoptions Committee of Great Ormond Street Hospital for Children National Health Service Trust, London, UK, which thus indicated that formal ethical approval and informed consent were not required. Anonymized patient information was reported with no significant deviation from standard clinical care as part of the observational quality-improvement project. Patient clinical and demographic data were retrieved through retrospective review of electronic health records and follow-up telephone screening for otolaryngologic manifestations. Data analyses were performed using Microsoft Excel 2010 on August 10, 2020.

Results | In total, 50 children met the case definition of PIMS-TS. The median age was 10 years (interquartile range, 8-13 years); 33 of 50 (66%) were male, and 36 of 50 (72%) were of Black, Asian, or other minority race/ethnicity. The median time between acute presentation with PIMS-TS and follow-up screening for otolaryngologic manifestations was 60 days (interquartile range, 45-76 days). Of 50 children, 12 (24%) had positive results from polymerase chain reaction tests to detect SARS-CoV-2, and 42 (84%) had positive immunoglobulin G antibodies against SARS-CoV-2 on serology testing. Of 50 children, 38 (76%) required admission to a pediatric intensive care unit (PICU), and 18 (36%) required intubation for mechanical ventilation. In total, 19 of 50 patients with PIMS-TS (38%) who underwent telephone follow-up screening for otolaryngologic manifestations required a further in-person follow-up with an otolaryngologist. These follow-ups were required for otolaryngologic manifestations, which were most commonly dysphonia, dysphagia, and anosmia/hyposmia and were persistent at the time of follow-up screening (15 of 50 children [30%]) or were significantly present during acute PIMS-TS presentation (4 of 50 children [8%]). Initial otolaryngologic manifestation rates for the total PIMS-TS cohort as well as by intubated, nonintubated, PICU, and non-PICU subgroups are represented in a heat map (**Figure**). Data on otolaryngologic investigations and management rates at follow-up are presented in the **Table**.

Discussion | Elevated rates of otolaryngology manifestations, such as dysphonia, dysphagia, and anosmia/hyposmia, persisting for longer than 6 weeks warrant otolaryngologic follow-up screening and review as required through the multidisciplinary team for all children recovering from PIMS-TS. There are several postulated explanations for otolaryngologic manifestations within the adult population with COVID-19 that are possible etiologic characteristics of PIMS-TS. Dysphonia, for instance, may be caused by laryngeal involvement of the airway inflammatory process leading to vocal fold edema or inflammation.[3] It has been suggested that otolaryngologic symptoms, such as anosmia and dysgeusia, are due to preferential SARS-CoV-2 infection of the nasal epithelium through angiotensin-converting enzyme 2 protein expression.[4] Postintubation dysphagia and dysphonia during the COVID-19 pandemic have been thought to result from oropharyngeal and laryngeal trauma and neuromuscular weakness as a consequence of prolonged nonuse of structures during long-term intubation.[5] Further studies are required to identify patient- and disease-associated factors, such as race/ethnicity or need for intubation, that may increase the risk of persistent otolaryngologic sequelae. Because the long-term sequelae of this disease are unknown, it is prudent for children with a history of PIMS-TS to be reevaluated by the infectious diseases team within 12 months and referred to otolaryngology for any persistent symptoms. This study was limited by being a single-center, rather than a multicenter, study.

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