COVID-19 Symptomatology from the Otorhinolaryngology Perspective : Survey from Tertiary Care Center

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ABSTRACT

Introduction

To identify and substantiate the prevalence and severity of different otolaryngological symptoms documented in laboratory-confirmed COVID-19 patients.

Materials and Methods

This monocentric study was performed at a tertiary care hospital during the COVID-19 pandemic and all patients testing positive for COVID-19 over a 16-month period (April 2020 to July 2021) were recruited. Demographic features, general symptoms, and otolaryngological symptoms were evaluated and compared by disease severity. Patients with otolaryngological manifestations were asked to complete questionnaires and their symptom severity was evaluated using visual analogue scale (VAS).

Results

722 patients with mild to moderate COVID-19 infection were included in the study. Median age was 37.7 ± 10.6 years (range 19–85 years), 66.20% (n = 478) were males and 33.79% (n = 244) were females. The most common general symptoms were fever, cough and fatigue/malaise with respective frequencies of 77.42%, 67.45% and 54.70%. The most common otorhinolaryngologic symptoms were sore throat, headache and olfactory dysfunction with respective frequencies of 19.52%, 17.03% and14.81%. Highest general symptom severity was for fever (median VAS =8) and highest otolaryngologic symptom severity was for hyposmia/anosmia (median VAS =8).

Conclusion

Otolaryngologic manifestations of COVID-19 are not as common as fever and cough. However early recognition of otolaryngologic manifestations should help to screen, identify and thereby quickly isolate symptomatic COVID-19 patients from the general population and also facilitate care givers to take necessary precautions to protect themselves.

Keywords

COVID-19; SARS-CoV-2; Otolaryngology; Anosmia; Hyposmia; Dysgeusia

COVID-19 is caused by a novel virus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and because of its high potential for human-to-human transmission, it has quickly transformed into a global pandemic. Direct contact, droplets and aerosols, fomites, feco–oral, blood borne, mother to child, and animal to human transmission are all potential routes of spread for this virus.[1]

This ongoing viral pandemic originated in Wuhan, China, in December 2019 and has rapidly spread throughout the world.[2] This is the third novel coronavirus reported in the preceding 17 years, and it is intimately associated to bat-derived SARS-like coronaviruses phylogenetically.[3] As of November 28, 2021, there were 260 million confirmed cases of COVID-19 and 5.2 million deaths globally.[4] Acute respiratory distress syndrome (ARDS) and cytokine storm can render elderly patients with comorbidities (cardiovascular disease, chronic respiratory disease,

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diabetes mellitus, cancer, renal disease) more vulnerable to COVID-19 infection and potentially life-threatening complications.[5] These patients require ICU admission and treatment.

As the disease transformed into a pandemic, many studies found that clinical staff have a high prevalence of infection.Otolaryngologists are more vulnerable to COVID-19 infection as they regularly deal with mucosal surfaces with high viral loads.[6] Infact the first reported physician fatality related to COVID-19 was that of an otolaryngologist.[7]

Owing to the increasing number of true positives and the dearth of test kits and facilities, especially in developing countries, determining the number of diagnostic symptoms of this infection in order to decide on self-isolation and minimize infection transmission is extremely crucial for both general population and healthcare workers.

Fever, cough, diarrhea, and fatigue are among the most prevalent clinical symptoms of COVID-19.[2] Although ear, nose, and throat symptoms are common in COVID-19 patients, the literature does not address them significantly. ENT symptoms such as pharyngodynia, sore throat, nasal obstruction, rhinorrhea, enlarged cervical lymph nodes and changes in olfaction and taste can be encountered by an otolaryngologist while examining COVID-19 positive patients.[8, 9] Several studies from other countries reported higher incidence of upper respiratory symptoms and lately smell loss has become a prominent symptom of the disease.[10-14]

The COVID-19 pandemic has developed into a global public health emergency, and otolaryngologists are at increased occupational risk of catching SARS-CoV-2 infection tract during diagnostic and therapeutic procedures, because of its rapid spread through respiratory secretions. Aerosolization with nosocomial propagation of the infection may be observed during general otolaryngology procedures.The COVID-19 pandemic has the potential to drastically alter otolaryngologists' practice, which has ethical ramifications and associated concerns about public health management and safety. In COVID-19 epidemic zones, an otolaryngologist's regular practices are constantly at high risk of contagion.[15]

The objective of our research was to identify and substantiate the prevalence and severity of different otolaryngological symptoms documented in COVID-19 positive patients so as toenhance clinicians understanding of COVID-19's most common otolaryngologic symptoms. We intend to learn more about the pervasiveness of sinonasal manifestations in COVID-19 and their implications as pathognomonic symptoms of this disease.

Materials and Methods

This prospective monocentric cross-sectional observational study was conducted at a tertiary care hospital at Nuh, Haryana for duration of 16 month from April 2020 to July 2021. This hospital has been assigned by the Government of India to treat COVID-19 positive patients. This research focused on hospitalized subjects who had been diagnosed with laboratory-confirmed 2019-nCoV infection.This study was approved by the institutional review board of the hospital.

All COVID-19 positive patients were isolated with airborne and contact precautions, and visiting staff wore personal protective equipment, as recommended by the US Centers for Disease Control and Prevention.[16] Individuals with mild to moderate COVID-19 disease, also known as patients who do not require intensive care, were the focus of our research. All patients who participated provided consent to participate in this study. Inclusion criteria 1. SARSCoV-2 real-time reverse transcriptase–polymerase chain reaction (RT-PCR) confirmed COVID-19 infection (RT-PCR). 2. Adult (>18 years). 3. Clinically stable patients having mild to moderate symptoms and able to complete the questionnaire.[17] Exclusion criteria 1. Suspected COVID-19 cases but not laboratory confirmed. 2. Patients having history of allergic rhinitis or chronic rhino sinusitis, dementia, malignancy or nasal surgery. 3. Patients admitted in the intensive care unit at the time of the study.

Out of 1129 COVID-19 patients that tested positive during the course of our study, 722 were enrolled in our study. The study was conducted in conformance with the principles of Helsinki Declaration. Real-time PCR (RT-

PCR) was used to confirm the diagnosis on nasopharyngeal and oropharyngeal swabs.

Clinical data of all the confirmed COVID-19 patients was prospectively collected during the ear, nose, and throat (ENT) consultation in the isolation ward of the designated hospital. The demographic and clinical variables studied included: age, sex, comorbidities, general and otolaryngological symptoms. Radiologic assessments included HRCT chest and all laboratory tests (a complete blood cell count, blood chemical analysis, coagulation testing, assessment of liver and renal function testing, C-reactive protein, creatine kinase, and lactate dehydrogenase) were performed according to the clinical needs of the patient The participants olfactory function were evaluated using readily available household items such as soap, peppermint, coffee, pepper,lemon, cloves, garlic, and so on. Gustatory functions were also evaluated for the four tastes.

Participants were given a standardized questionnaire. To avoid any ambiguity, patients were asked to describe their symptoms and then each symptom was discussed at length. If the patient had the symptom for more than two months before hospitalization, it was ruled out as being unrelated to COVID-19. The Visual Analogue Scale (VAS) was used to evaluate symptom severity; a subjective scale of 0–10, with 0 indicating "no symptoms" and 10 signifying "severe symptoms". Data was entered in a Microsoft Excel spreadsheet and IBM-SPSS statistical software version 22 was used foranalyzing the data. Continuous variables were summarized as mean and standard deviation when normality criteria were met, otherwise as median and ranges. Chi-Square test was used to compare between categorical variables. Independent-Samples T-test was used for the comparison of the means. Statistical significance level was taken as $p<0.05$.

Results

Between April 2020 and August 2021, 1129 patients tested positive for SARS-CoV-2 RNAT. Of these, 722 patients met the inclusion criteria and were enrolled in the study. The mean age was 37.7 ± 10.6 years with a range of 19–85 years. In our study, 66.20% patients (n = 478) were males and 33.79% (n = 244) were females (Table 1). Among these, maximum number of patients were in 36-50 age group and the least number of cases were seen in 19-35years age group (Table 2).

Hypertension (23.68%), diabetes (17.86%) and chronic lung diseases (11.77%) were the most prevalent comorbidities in the study population. Other comorbidities were less frequent (Fig. 1).

Table I : Gender wise distribution

GENDER	NO. OF CASES	PERCENTAGE (%)
Male	478	66.20
Female	244	33.79
Total	722	100.00

Table II : Age distribution

AGE GROUP (YEARS)	NO. OF CASES	PERCENTAGE (%)
19-35	101	13.98
36-50	259	35.87
51-75	213	29.50
>75	149	20.63

Figure 2 depicts the general symptoms documented by patients during the duration of the infection. Fever (77.42%), cough (67.45%), fatigue/malaise (54.70%), difficulty in breathing (32.54%), myalgia/arthralgia (26.17%), nausea/vomiting (23.54%) and diarrhea (5.12%) were the most prevalent symptoms.

When the study population was assessed for symptomatic distribution of otolaryngological symptoms, the most common otolaryngological symptoms observed in these positive subjects were sore throat (19.52%), headache (17.03%) and olfactory dysfunction (14.81%). Rest of ENT symptoms were less frequent (Fig. 3). Only 7 patient's reported dizziness (0.96%), and 2 reported facial paralysis (0.27%). No patients reported diminution of hearing, hoarseness, or stridor.

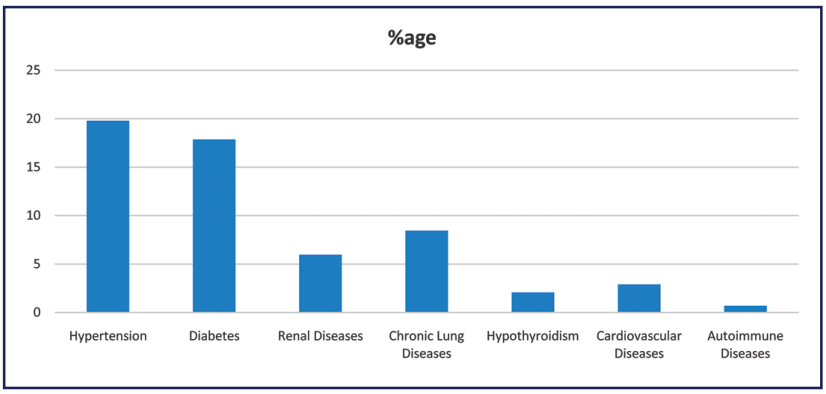

Fig. 1. Comorbidities associated with COVID-19 positive cases

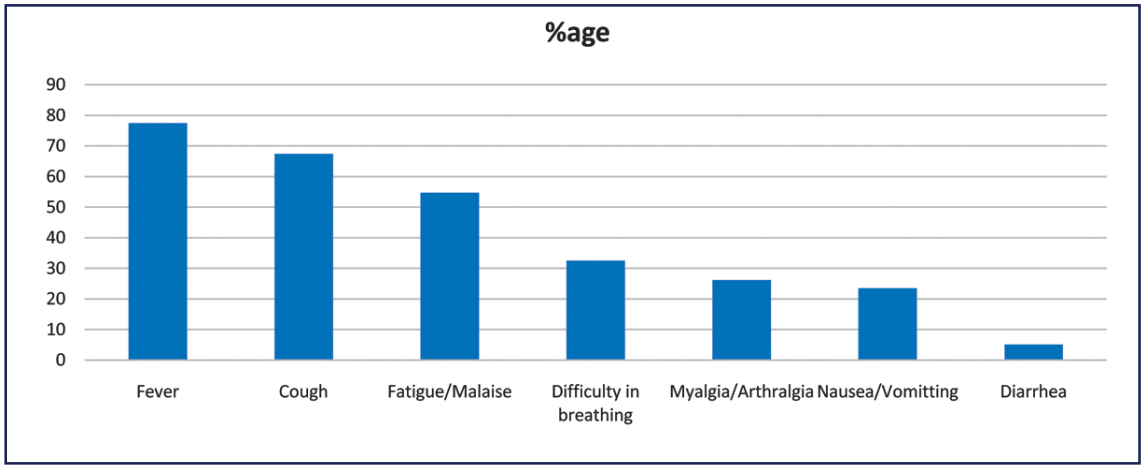

Fig. 2. General Symptoms associated with COVID-19 infection

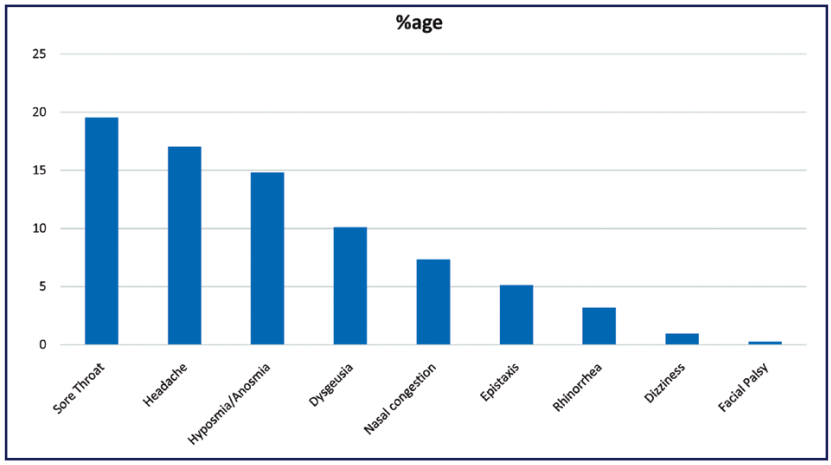

Fig. 3. Otolaryngological symptoms associated with COVID-19 infection

General symptom severities across patients are summarized in Table 4. Highest general symptomseverity was for fever with a median VAS score of 8. Highest otolaryngologic symptom severity was forhyposmia/ anosmia with median VAS score of 8. Other median severity VAS scores ranged between 4 and 7.

Table III : Patient general symptom severity

GENERAL SYMPTOM	MEDIAN	INTER-QUARTILE RANGE (IQR)
Fever	8	5 - 10
Cough	6	5 - 8
Fatigue/Malaise	7	5 - 8
Difficulty in breathing	5	4 - 7
Myalgia/Arthralgia	6	5 - 7
Nausea/Vomiting	5	4 - 8
Diarrhea	4.5	4 - 5

Table IV : Patient otolaryngologic symptom severity

OTOLARYNGOLOGIC SYMPTOMS	MEDIAN	INTER-QUARTILE RANGE (IQR)
Sore Throat	5	4 - 7
Headache	6	5 - 8
Hyposmia/Anosmia	8	5 - 10
Nasal Congestion	4.5	4 - 5
Dysgeusia	6	5 - 8
Rhinorrhea	5	3 - 5
Dizziness	4	3 - 6
Facial Palsy	N/A	N/A
Epistaxis	4.5	4 - 5

Discussion

COVID-19 has a wide range of clinical symptoms, from asymptomatic infections to mild and severe disease. COVID-19 has infected millions and killed hundreds of thousands over the world to date, and it continues to be a serious challenge.[18, 19] Despite the fact that mitigation and containment measures have begun to limit the transmission of new infections, COVID-19 remains an active global pandemic, with some populous areas of the globe still in the formative stages of propagation.[20, 21] Furthermore, even if COVID-19 is under control, there is still concern of a new wave or sporadic outbreaks of the virus.[22]

When COVID-19 was first discovered, the symptoms of fever, cough, and shortness of breath were emphasized because they were the most typically reported by patients. However, ENT manifestations have been found in the spectrum of COVID-19 symptom and they may be useful in early detection of asymptomatic carriers or patients with mild symptoms. Moreover, because of their close interaction with the mucus membrane of the upper respiratory tract, otorhinolaryngologists are particularly vulnerable. The nasal, nasopharyngeal, and/or oropharyngeal tissue is a principal reservoir area for infection, a primary site for collecting samples for testing, and a primary source of infection transmission. Because otorhinolaryngologic examinations generate aerosol, it is critical to identify which patients are at a higher risk of disease transmission and take the appropriate precautions.[15, 23]

The majority of published COVID-19 research focuses on the lower respiratory tract manifestation and sequelae. Because the literature on ENT manifestations during COVID-19 infection is currently limited, there is merit in exploring ENT manifestations of such a novel virus.[24] As per previous research,[25, 26] non-ENT symptoms such as fever and cough are more common in COVID-19 patients than ENT manifestations. However, ENT manifestations are not infrequent in these patients. These symptoms are more common in the early stages of the disease.[27] The diagnosis of these symptoms may assist in the isolation of pauci-symptomatic patients.[28]

Our patient's general symptoms were comparable to those documented in other publications,[2, 29, 30-32] with fever and cough being the most common symptoms in our study population.

El Anwar M et al. reported that fever (73.5%) and cough (61%) are the most common symptoms of COVID-19.[33] The findings of our study were comparable, with fever observed in 77.42% of the patients and cough seen in 67.45% of the patients. However, according to the findings of the Salepci E et al study, the most prevalent general symptom was fatigue followed by cough and fever.[24]

We sought to gather data on ENT symptoms in laboratory confirmed COVID-19 individuals that were mild to moderately symptomatic in our study. Sore throat and headache were the most common ENT manifestations. However, it is obvious that their prevalence is far lower than that of fever and cough in our study population. In contrast, nasal congestion (7.34%) and epistaxis (5.12%) were observed to occur at roughly the same rate as diarrhea in our patients (5.12%). Only 3.18% of COVID-19 patients reported rhinorrhea. Facial palsy was reported in 2 patients (0.27%).

One of the most common causes of olfactory dysfunction in adults is post-viral anosmia. Viruses that cause the common cold or upper respiratory tract infections are widely known for causing post-infectious olfactory loss. Coronaviruses previously described are thought to account for 10-15% of cases.[33]

Hyposmia and dysgeusia were observed in 14.81% and 10.11% of patients, respectively. The lower prevalence of olfactory dysfunction in our study population is consistent with findings from other Asian studies.[34-36] No auditory or laryngeal manifestations were reported in our study.

Therefore, if we had to choose one ENT manifestation to be added to the definition of suspected cases or the triage check list for COVID-19, we will choose sore throat and hyposmia/anosmia. It is also recommended to consider patients with olfactory dysfunction as COVID-19 suspects, and isolate and test them properly.[7] This may help in early identification of cases and thus, help in breaking the chain of transmission of this deadly disease.

Although data on ENT manifestations during the COVID-19 outbreak is scarce, this novel virus's ENT manifestations need to be investigated and also used to describe the epidemic more precisely. According to Salepci et al., concentrating exclusively on thermometry and probing patients only for general symptoms leads to false optimism. They suggested that otorhinolaryngologists be on the watch not just for general symptoms but also for otorhinolaryngologic symptoms that could be related to COVID-19.[24]

The current study has certain limitations. Our subset of patients included mild to moderate COVID-19 patients with minor comorbidities, which may not be representative of the affected communities. Having said that, our study is one of the main monocentric cohort of confirmed COVID-19 cases in north India, and this study is the first to evaluate the prevalence of otolaryngological manifestations in COVID-19 positive subjects in this region. The constraints mentioned above should be considered in future studies evaluating and characterizing ENT manifestations in COVID-19 patients, as any addition to our knowledge will be beneficial.

Conclusion

Otorhinolaryngologic manifestations of COVID-19 are not uncommon, particularly in mild and moderate forms of the disease. During airway management and endoscopy, E.N.T. surgeons are exposed to viral aerosols and as such their wellbeing becomes vital.

According to the findings of this study, many COVID-19 participants had otolaryngologic complaints in addition to lower respiratory symptoms. Otorhinolaryngologists ought to be cognizant of these in order to provide high-quality care to their patients and to safeguard themselves at the same time.

As a conclusion, we believe that the international scientific community should recognize ENT manifestations as symptoms of COVID-19 infection, and that primary care physicians and otolaryngologists should be on the lookout for these ostensible manifestation.

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