

SPECIAL ARTICLE COVID-19

ENT Manifestations in Patients Suffering from COVID-19: Study from a COVID Hospital in North India

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Int Arch Otorhinolaryngol 2022;26(1):e148–e151.

Abstract

Introduction COVID-19 has been one of the worst pandemics faced by the human civilization, and otorhinolaryngological manifestations are commonly seen in this disease.

Objective The present study was done to profile the ear, nose, and throat (ENT) manifestations in patients diagnosed with COVID-19. An attempt has also been made to assess whether there was any difference between the symptoms of different strains of COVID-19. A brief review of the current knowledge of the transmission of the disease and its treatment has also been done.

Methods A cross-sectional, record-based study was conducted in a COVID hospital of India between May and July 2020. Descriptive statistics were used and appropriate parametric/nonparametric tests were applied to assess the association between various variables.

Results Out of 250 patients, 80 cases were asymptomatic and 170 were symptomatic. Most of the symptomatic patients had sore throat and nasal congestion.

Conclusion Knowledge of the ENT manifestations of COVID-19 is essential for its early identification and to devise appropriate prevention protocols for the benefit of health care workers (HCWs) and of the general population.

Keywords

- ▶ covid-19
- ▶ ENT
- ▶ otorhinolaryngology manifestations
- ▶ pandemic
- ▶ SARS-COV-2

Introduction

COVID-19 is an infectious disease caused by a novel virus, the Severe Respiratory Syndrome Corona Virus 2 (SARS-CoV-2).^{1,2} The disease was officially named as COVID-19³ by the World Health Organization (WHO) on February 11, 2020. This disease started in China and, due to the high infectivity of the virus, rapid transmission occurred, leading to a pandemic.² Corona virus commonly affects animals, but a few of them are known to affect humans as well.⁴ This virus

was initially traced to the sea food market of Hunan, South China, where live animals were sold, but eventually no specific conclusion could be drawn.⁵

The present study focuses on the ear, nose, and throat (ENT) manifestations in patients diagnosed with COVID-19. Knowledge of the symptoms helps in the early identification of the affected individuals. It also helps in the categorization of patients depending on the severity of the disease. This could eventually lead to an interruption of the transmission chain of the virus.

received
May 17, 2021
accepted after revision
October 17, 2021

DOI <https://doi.org/10.1055/s-0041-1740987>.
ISSN 1809-9777.

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Material and Methods

A cross-sectional, record-based study was conducted in the department of ENT of a tertiary care center in North India. The duration of the study was of 3 months (May 2020 to July 2020). An approval of the institutional ethics committee was obtained prior to the beginning of the study. Patients of all genders, of all ages, diagnosed with COVID-19 and admitted to the COVID hospital of the same center were taken into consideration. Patients who were COVID negative, irrespective of their pathologies, were excluded from the study. Based on the inclusion criteria, the total sample included during the study period comprised 250 patients. The data was recorded using the charts review data collection method based on the articulated aims of the study. Then, they were analyzed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) and IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used. Appropriate parametric and nonparametric tests were applied to assess the association between various variables and were expressed in percentage.

Results and Analysis

Data of 250 patients were included in the study. There were 131 males (52.4%) and 119 females (47.6%). A total of 170 (68%) patients were symptomatic and 80 (32%) were asymptomatic. Most of the patients who presented with symptoms were in the age range between 21 and 30 years old (34.14%), followed by patients in the age range between 31 and 40 years old (32.35%) (→ **Table 1**). On the assessment of the data from the symptomatic patients, it was observed that majority ($n = 113$; 66.46%) of the cases had sore throat, followed by 92 cases of nasal congestion (54.14%). Breathing difficulty was present in 71 cases (41.71%), and 63 cases presented with dry cough (37.07%). The least reported symptom was altered sense of taste ($n = 3$; 1.76%).

Discussion

Origin, Genetics, Transmission, and Characteristics of COVID-19

COVID-19 is caused by the SARS-CoV-2 virus. It is one of the six coronaviruses that affect humans. Amongst these, the

SARS-CoV and MERS-CoV viruses cause severe respiratory syndrome, and the other four viruses, HCoV-OC43, HCoV-229E, HCoV-NL63, and HCoV-HKU1 cause mild upper respiratory diseases.⁶ Phylogenetically, the genome of the SARS-CoV-2 virus is different from those of the other viruses of the same family; it belongs to the subgenus Sarbecovirus,⁷ which is a type of β coronavirus.⁶ The human SARS-CoV-2 virus has genomic similarity to bat-derived coronavirus strains, namely bat-SL-CoVZC45 and bat-SLCoVZXC21;^{7,8} therefore, bats are considered a natural viral host.⁹

Genetically, COVID-19 has a single positive sense stranded RNA. It also contains cDNA, which can be broken down into 29.86% adenosines, 18.39% cytosines, 19.63% guanines, and 32.12% thymines. Several mutations have also been identified, such as T8782C, T9561C, C15607T, C28144T, and T29095.^{7,10} Structural and nonstructural proteins, such as RNA-dependent RNA polymerase (RdRp), Spike protein (S), Envelope protein E, membrane protein (M), ORF3a, ORF7a, and ORF8 play a very important role in the viral pathogenesis of COVID-19.¹⁰

The SARS-CoV-2 virus is transmitted from human to human, which goes against the earlier speculations of its transmission from bats via other mammalian hosts.⁹ Another strain of this virus that is similar to COVID-19 is the Malayan Pangol strain (SARS-CoV2-like);¹¹ therefore, in some studies conducted, initially both bats and the Malayan Pangol were held responsible for the transmission of the disease. In 2019 the disease spread started from the Chinese city of Wuhan, in the province of Hubei, and eventually spread to other parts of the world. According to the WHO, until July 31, 2020, there were a total of 1,75,06,007 laboratory-confirmed cases and of 6, 68,910 deaths, making this pandemic one of the worst pandemics ever faced by humankind.¹²

The virus is thought to be transmitted via aerosols produced during sneezing, coughing, or talking with infected people.^{1,9} Fomite transmission has also been reported.¹ Preventive measures such as use of masks and thorough cleaning of hands, clothes, and shoes, and maintaining social distance can break the chain of transmission.¹³

The incubation time for COVID-19 is of ~ 14 days, although some patients develop symptoms between 2 and 7 days after infection.⁴ Patients with better immunity are silent carriers of the disease and, consequently, the risk of disease spread has increased.⁷ According to Van Doremalen et al., the SARS-CoV-2 virus was able to survive in aerosols for 3 hours, on plastics and stainless steel for 72 hours and on copper for 4 hours, while on paper or on cardboard for 24 hours.¹⁴

ENT Manifestations of COVID Patients

The entry point and the site for COVID-19 viral reproduction is though the nasal cavity; however, $< 10\%$ of infected patients present to the hospital with nasal complaints.¹⁵ The disease can manifest in the form of various symptoms, such as fever, cough, breathing difficulty, fatigue, myalgia, rhinorrhea, and disturbances in the sense of smell and taste. In the later stages of the disease, symptoms of pneumonia,

Table 1 Age profile of symptomatic patients

Age group (years old)	Number of cases (n)	Percentage (%)
0–10	3	1.76
11–20	19	11.19
21–30	59	34.14
31–40	55	32.35
41–50	18	10.9
51–60	12	7.07
61–70	4	2.36

acute respiratory distress syndrome (ARDS), and respiratory failure have also been reported.^{16–18}

The results of our study showed that the most common presentation was sore throat, followed by nasal congestion. Patients also presented with dry cough and breathing difficulty. Few patients also complained of alteration of the sense of smell and taste. Most patients complained of tiredness, generalized body ache, anxiety, anorexia, and headache. According to the report by Dagur et al.,⁷ common symptoms of COVID-19 are high grade fever, tiredness, and dry cough. A meta-analysis by Krajewska et al.⁹ demonstrated that, in the Chinese studies, fever and dry cough were frequently encountered symptoms, whereas in Australian studies, rhinorrhea and dyspnea were commonly seen. Studies from South Korea, Italy, China, and Germany reported hyposmia and anosmia as frequently encountered symptoms.⁹

Crucial Information Relevant to Otorhinolaryngologists

Since the nasal cavity acts as the entry point of the virus, the role of otorhinolaryngologists is an important one in the early detection of the disease. This aspect puts ENT doctors at a high risk of infection. Guidelines have been issued by the Ministry of Health of the Government of India to prevent contamination or spread of infection to otorhinolaryngologists.¹⁹ Use of laryngeal and nasal endoscopes and other aerosol-generating procedures have been advised to be performed only in emergency conditions with proper precautions.¹¹ It has also been recommended by international health agencies, such as the European Rhinologic Society,²⁰ that patients coming to the Out Patient Department (OPD) with unknown COVID status should be dealt with extreme care using full protective measures. Use of personal protective equipment (PPE) and sanitizers is essential. A PPE kit should include gloves, N95 masks, shoe covers, head covers, eye protection, and gowns.²¹ It is recommended that patients not requiring urgent ENT consultation should be consulted via phone or telemedicine. Patients who come to the OPD should be screened at the entrance of the clinic/hospital by checking their body temperature and should be enquired regarding their history of foreign travel or of contact with COVID-19 patients.^{19,21}

Diagnosis and Treatment Protocol

A history of fever, cough, nasal congestion, foreign travel, or contact with COVID-19-positive patients is strong evidence of suspicion of COVID-19, but molecular confirmation is a must for the diagnosis. Various methods, such as body temperature scanning, chest computed tomography (CT), antigen rapid test, and real-time reverse transcriptase poly-chain reaction (RT-PCR) test are available for screening and diagnosing the disease, but the gold standard test is RT-PCR.²² The sensitivity of RT-PCR varies; therefore, it is recommended to repeat the test at regular intervals. Protocols issued by the Ministry of Health of the Government of India recommend testing at 0, 5, and 15 days after exposure.¹⁹

Currently, nasopharyngeal and oropharyngeal specimens are taken for the molecular testing of COVID-19. Bronchoalveolar lavage and tracheal secretions can also be used for molecular testing, but due to their invasive nature, they are restricted to unconscious patients, tracheostomized patients, or patients on ventilators.⁵ Computed tomography of the chest is another noninvasive technique that can be used to assess the COVID-19 status. Some researchers have recommended using chest CT for the diagnosis of COVID-19 in areas with high case loads.²² This recommendation was based on studies in which the sensitivities of the RT-PCR test and chest CT were found to be 59 and 88%, respectively.²³ Many patients had findings of viral infection on chest CT before the first RT-PCR test detected the SARS-CoV-2 virus. Studies have also shown that chest CT shows improvement in the follow-up of the patient even before the RT-PCR turned negative.²³

Currently, no laboratory abnormalities are specific for COVID-19, but some researchers believe that decreased thrombocytes along with raised erythrocyte sedimentation rate and C-reactive protein are indicative of the disease. Increased D-dimer, serum creatinine, and lactate dehydrogenase levels can also be seen in some patients.²¹

Studies are being done to invent antiviral agents that can prevent as well as treat this condition. In the initial period of the pandemic, a few studies suggested the use of chloroquine or hydroxychloroquine (HCQ) combined with Lopinavir/Ritonavir²⁴ for the management of the disease. On July 4, 2020, the WHO accepted the recommendations of the Solidarity Trial's International Steering Committee to discontinue the use of chloroquine, of HCQ, and of Lopinavir/Ritonavir as medications for the treatment of COVID-19.²⁵

Initially, many studies were against the use of steroids in COVID-19 cases. The key factor for apprehension regarding corticosteroids were the lack of knowledge regarding accurate dosage, fear of exacerbation of the symptoms, and the ability of steroids to induce a persistent inhibition of the hypothalamic-pituitary-adrenal (HPA) axis.²⁶ Furthermore, it was also thought that constant use of steroids can produce an iatrogenic hypercortisolemic condition that increases the risks, especially in intensive care unit (ICU) patients.²⁶ Contrary to this, the current protocol recommends the use of steroids in severe cases for the management of respiratory problems. This is due to the fact that corticosteroids in COVID-19 act as a means to stave off the cytokine storm and its consequences, such as ARDS, disseminated intravascular coagulation (DIC), hypotension, and shock. Corticosteroids in low dosage given in the initial stages, when dyspnea begins, can reduce morbidity and mortality.²⁷ Studies on COVID-19 patients who were administered corticosteroids, showed that judicious use of corticosteroids improves several parameters in severe COVID patients, such as reduction in the duration of hospital stay, prevention of worsening of ventilator parameters, progression to ARDS, improvement in the oxygenation status, and reduced requirement of intubation.²⁸ Supportive medications, such as multivitamins, omega-3 polyunsaturated fatty acids,

selenium, zinc, and iron supplements are beneficial in the treatment of COVID-19.²⁹

Conclusion

The nasal cavity and the nasopharynx act as the reservoir of COVID-19 infection. Therefore, it should be given importance to the ENT manifestations of the disease, as they help in the early identification of infected patients, in the categorization of patients based on disease severity, and in devising prevention protocols. Otorhinolaryngologists are prone to the infection and, therefore, should take appropriate precautions in the management of the patients.

Ethical Standards

The authors assert that all the procedures contributing to the present work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Financial Support

The present research received no specific grant from any funding agency, commercial or not-for-profit sectors.

Conflict of Interests

The authors have no conflict of interests to declare.

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