



Frequency and severity of general and ear nose throat (ENT)- related symptoms in COVID-19 patients in a tertiary care hospital - A retrospective observational study

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Abstract

Background: Coronavirus disease 2019 (COVID-19) is a contagious respiratory and vascular disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a specific type of coronavirus. This human RNA coronavirus was isolated in December 2019 in the city of Wuhan, China. In March 2020, World Health Organization (WHO) declared that COVID-19 is a pandemic disease. The aim of this study was to determine the frequency and severity of the general symptoms of patients diagnosed with SARS-CoV-2, as well as the frequency and severity of ENT-related symptoms. **Material & Methods:** This was a retrospective observational study and was conducted in the Department of Otolaryngology & Head Neck Surgery of Dr Sirajul Islam Medical College & Hospital, Dhaka, Bangladesh during the period from July, 2020 to June, 2021. In this study, we included 250 patients who had a history of SARS-CoV-2 infection, confirmed by PCR testing. **Results:** The majority (26.8%) of our patients were aged > 65 years, & most of our patients were male (55%). Mean age was 50.35 ± 17.41 years. Majority (38.4%) of our patients had HTN, 33.6% had DM, & only 15.2% had asthma. Among all patients, runny nose (81.6%), fever (74.8%), loss of sense of smell (73.6%), loss of sense of taste (67.6%) were the most common symptoms. Olfactory dysfunction (78.4%) was the most common. We found severe cases of taste disturbance while dyspnea & headache indicates a moderate level of severity. Sore throat, runny nose & tinnitus were assessed as mild levels of severity. **Conclusion:** In our study, we found patients infected with SARS-CoV-2 may present to hospitals with a variety of general and ENT symptoms. Age, vertigo/dizziness, sore throats, and tinnitus was significantly related to frequency & severity of ENT symptoms associated with COVID-19 infection. Symptoms related to the sense of smell, taste and hearing are some of the most common symptoms in the course of COVID-19, which is important in the therapeutic and epidemiological management of patients.

Keywords:- COVID, Frequency, Severity, ENT.



INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a contagious respiratory and vascular disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a specific type of coronavirus. This human RNA coronavirus was isolated in December 2019 in the city of Wuhan, China.^[1] In March 2020, World Health Organization (WHO) declared that COVID-19 is a pandemic disease.^[2] This infection has high contagious nature of transmission among people and also causes mild or no symptoms in the majority of cases.^[3] SARS-CoV-2, the seventh member of the family of Coronaviruses (CoVs) belonging to the family of Coronaviridae, are single-stranded enveloped positive sense RNA viruses having spikes like surface projections and appear like a crown when seen under the electron microscope. Severe Acute Respiratory Syndrome (SARS)-CoV and the Middle East Respiratory Syndrome (MERS)-CoV were other previous outbreaks of coronaviruses (CoVs).^[1]

The most common symptoms of COVID-19 are fever, cough, myalgia, fatigue, and difficulty breathing. In addition, ear, nose, and throat (ENT) symptoms, including loss of sense of smell and/or loss of sense of taste (STL) have been reported as symptoms caused by the virus.^[4,5] Rhinoviruses, Epstein-Barr virus, parainfluenza virus, and some coronaviruses have been shown to cause upper respiratory infections, nasal congestion, and rhinorrhea, and may result in STL. Although the pathophysiology of STL developing after infection with these viruses is not yet clear, it has been suggested to be due to olfactory epithelial damage by the virus or its spread to the central nervous system.^[6,7] There are

increasing reports of SARS-CoV-2 causing STL both anecdotally and in the peer-reviewed medical literature. However, it has been reported that infection with SARS-CoV-2 may cause STL without nasal discharge and/or nasal congestion or any other symptoms in some patients, unlike other viruses that infect the upper respiratory tract.^[8,9]

There have been increasing reports that anosmia and dysgeusia are significantly linked to COVID-19 disease. British Rhinology Society literature showed higher viral concentration in the nasal cavity as compared to the throat. Anosmia and dysgeusia have also been reported in paucisymptomatic and asymptomatic COVID-19 positive patient, representing in most cases as the first or the only symptomatology manifestation.^[10] The American Academy of Otolaryngology- Head and Neck Surgery stated that anosmia and dysgeusia are reported symptoms of COVID 19 positive patients, hence suggesting that these symptoms must be kept in mind while screening patients with possible COVID-19 infection.^[11] Beta-coronaviruses, in which the SARS-CoV-2 belongs, not only involve the respiratory tract but can frequently invade the Central Nervous System (CNS). This has been documented for the SARS-CoV, MERS-CoV, and also in porcine hemagglutinating encephalomyelitis coronavirus (HEV 67 N). This suggests that the virus has the property of neuroinvasiveness with many studies highlighting the possible route of spread by olfactory epithelial damage by the virus and its spread to the Central Nervous System.^[1] This pathogen led to an excessive immune response and lung damage. The mortality rate was around 10%. In 2012, there were cases of

another high-mortality zoonotic disease (35%) also caused by a coronavirus—Middle East respiratory syndrome (MERS-CoV). This type of coronavirus was characterized by relatively low infectivity.^[1,12]

SARS-CoV-2 is also a virus of animal origin with a lower mortality rate than SARS and MERS-CoV, amounting to about 2%, but with higher infectivity. The virus reproduction rate is estimated at around 2-3, which means that one case generates about two to three new cases. The basis for the diagnosis of SARS-CoV-2 infection is the reverse transcriptase polymerase chain reaction test (RT-PCR). Biological material is most often collected from the nasopharynx.^[13,14] Otolaryngologists, Anaesthetist, and surrounding staff are a high-risk group for COVID-19 infection, as they are exposed to viral transmission directly through mucus and aerosolized particles during clinical examination, surgeries, or other interventions in the head and neck area.^[15]

A medical technique with a high potential for SARS-CoV2 virus transmission is an ENT clinical evaluation. Aerosol-generating procedures include endoscopic exams of the nose, sinuses, pharynx, and larynx. In contrast to the rest of the pharynx, the nasal cavity and nasopharynx had extremely high quantities of the virus, suggesting that it is present in the upper aerodigestive tract. As we currently know, the course of COVID-19 is varied. The patient's age, comorbidities and the virus variant are of great importance here. Regardless of the prevailing symptoms in the subsequent waves of infection, problems with the nose, throat or ear were quite frequent.^[16]

Objective of the study

The main objective of the study was to determine the frequency and severity of the general symptoms of patients diagnosed with SARS-CoV-2, as well as the frequency and severity of ENT-related symptoms.

MATERIAL AND METHODS

This was a retrospective observational study and was conducted in the Department of Otolaryngology & Head Neck Surgery of Dr Sirajul Islam Medical College & Hospital, Dhaka, Bangladesh during the period from July, 2020 to June, 2021. In this study, we included 250 patients who had a history of SARS-CoV-2 infection, confirmed by PCR testing.

These are the following criteria to be eligible for the enrollment as our study participants: a) Patients aged above 18 years; b) Confirmed COVID-19 patients after laboratory performed Reverse Transcription Polymerase Chain Reaction (RT-PCR). The tests are performed as per the methodologies prescribed by Indian Council of Medical Research (ICMR); c) Patients in mild and moderate category at the time of data collection; d) Patients who were well oriented; e) Patients who were willing to participate were included in the study And a) Patients with olfactory, gustatory, salivary dysfunctions before the pandemic, b) Patients with neurodegenerative diseases or with dysfunctions concerning the CNS or the PNS ; c) Patients with on high flow oxygen therapy with noninvasive ventilation (PEEP, CPAP etc.); d) Patients who are immunocompromised individuals were excluded from our study.

The questionnaire contained 26 questions. Nine questions concerned ENT symptoms, which

were: sore throat, dizziness, vertigo, hearing disorders, olfactory disorders, taste disturbance, headache, cough and dyspnea. In the case of hearing impairment, it was determined whether the condition was transient or permanent, whether it was accompanied by tinnitus and whether the patient suffered a deterioration in speech comprehension. The questions about the olfactory disorders included sub-items describing their nature (total loss of smell, deterioration of the sense of smell and cacosmia). Some questions were related to the occurrence and severity of gastrointestinal disorders, musculoskeletal disorders, skin lesions and memory impairment. The respondents were also asked about the severity and duration of all infection symptoms, the need for hospitalization and the use of passive or active oxygen therapy and the presence and duration of fever. The answers to the questions were recorded using 10-point VAS; the most severe symptoms were scored as 10 points, and no symptoms—0 points. It was assumed that the range of points 0–3 referred to mild symptoms, 4–6—moderate and 7–10—severe.^[16]

Statistical Analysis: All data were recorded systematically in preformed data collection form and quantitative data was expressed as mean and standard deviation and qualitative data was expressed as frequency distribution and percentage. Statistical analysis was performed by using SPSS (Statistical Package for Social Sciences) for windows version 10. Probability value <0.05 was considered as level of significance. The study was approved by Ethical Review Committee of Dr Sirajul Islam

Medical College & Hospital, Dhaka, Bangladesh.

RESULTS

[Figure 1] shows the majority (26.8%) of our patients were aged more than 65 years, followed by 17.2% & 15.2% of patients aged 58-65 & 50-57 years respectively. The least prevalent 9.6% & 6.4% were aged 26-33 years & 18-25 years old respectively.

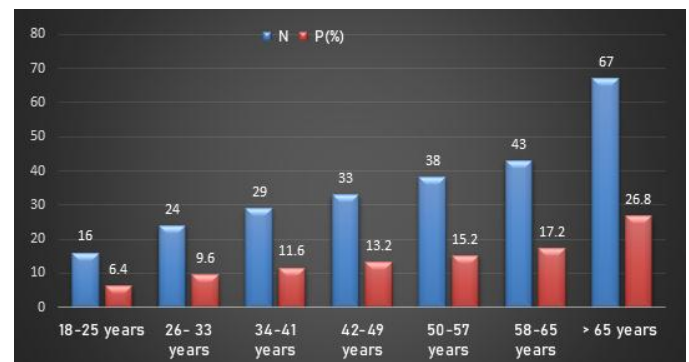


Figure 1: Age distribution of our study patients

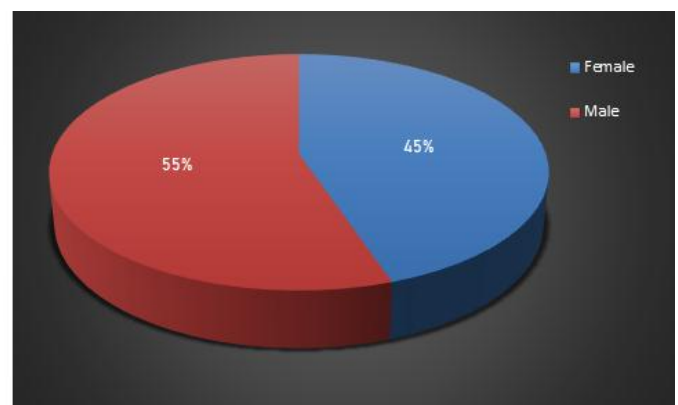


Figure 2: Gender distribution of our study patients

[Figure 2] shows most of our patients were male (55%) compared to female (45%). The male and female ratio was 1.23:1 in our study.

[Table 1] shows that the mean age was 50.35 ± 17.41 years, BMI was 28.67 ± 6.24 kg/m².

Majority (38.4%) of our patients had HTN, followed by 33.6% had DM, 16.4% & 15.6% hypothyroidism & hypotension respectively. Among all patients, only 15.2% had asthma, followed by 13.6% & 11.2% had heart disease & kidney disease respectively.

[Table 2] shows the clinical presentation of our study patients. Among all patients, runny nose (81.6%), fever (74.8%), loss of sense of smell

(73.6%), loss of sense of taste (67.6%), difficulty breathing (67.2%) & cough (59.2%) were the most common symptoms in our study.

[Table 3] shows that among all ENT symptoms olfactory dysfunction (78.4%) was the most common, followed by 73.6% had taste disturbance, 67.2% had dyspnea, 59.6% had headache, & 46.4% had sore throat.

Table 1: Baseline characteristics of our study subjects.

Baseline	N	P (%)
Mean age (years)	50.35 ± 17.41	
Education		
Illiterate	34	13.6
Primary education	71	28.4
Secondary education	91	36.4
Higher above	54	21.6
Height (cm)	158.97±17.107	
Weight (kg)	69.05±18.24	
BMI (kg/m ²)	28.67±6.24	
Heart Rate (per minute)	88 ± 19	
Systolic blood pressure (mm Hg)	135.24 ± 20.78	
Diastolic blood pressure (mm Hg)	83.94 ± 10.69	
Co-morbidities		
Diabetes mellitus (DM)	84	33.6
Hypertension (HTN)	96	38.4
Hypotension	39	15.6
Hypothyroidism	41	16.4
Heart disease	34	13.6
Kidney disease	28	11.2
Asthma	38	15.2

Table 2: Distribution of our study patients by clinical presentation.

Clinical presentation	N	P(%)
Dysphagia/odynophagia	48	19.2
Nasal obstruction	124	49.6
Sneezing	84	33.6
Runny nose	204	81.6
Cough	148	59.2



Post nasal discharge	52	20.8
Rhinorrhea	68	27.2
Dizziness	47	18.8
Fatigue	58	23.2
Ear pain	46	18.4
Facial pain/pressure	138	55.2
Loss of sense of taste	169	67.6
Loss of sense of smell	184	73.6
Fever	187	74.8
Sore throat	116	46.4
Headache	149	59.6
Myalgia	34	13.6
Difficulty breathing	168	67.2
Diarrhea	64	25.6

Table 3: Distribution of our patients by the frequency of reported ENT symptoms..

ENT symptoms	Number	Frequency
Olfactory dysfunction	196	78.4
Taste disturbance	184	73.6
Headache	149	59.6
Sore throat	116	46.4
Runny nose	106	42.4
Vertigo /Dizziness	47	18.8
Dyspnea	168	67.2
Tinnitus	112	44.8

Table 4: Distribution of our patients by severity of ENT symptoms assessed on the VAS scale (1-10)

ENT symptoms	VAS (Mean \pm SD)	P-value
Olfactory dysfunction	4.25 \pm 1.18	0.048
Taste disturbance	7.15 \pm 0.23	0.039
Headache	5.13 \pm 0.78	0.021
Sore throat	3.85 \pm 1.43	0.042
Runny nose	3.41 \pm 0.84	0.014
Vertigo /Dizziness	4.12 \pm 1.21	0.014
Dyspnea	5.58 \pm 1.02	0.036
Tinnitus	3.25 \pm 0.18	0.035

[Table 4] shows the severity of ENT symptoms assessed on VAS scale. Most of our patients were severe cases of taste disturbance because the mean VAS was higher, the mean dyspnea

was 5.58 \pm 1.02, mean headache was 5.13 \pm 0.78 which indicates a moderate level of severity. Sore throat, runny nose & tinnitus were assessed as mild levels of severity.

DISCUSSION

The list of symptoms seen by SARS-CoV-2 patients is constantly growing and includes a wide variety of ENT-specific and/or general symptoms. Anecdotal accounts and published publications on COVID-19 in recent weeks have both suggested that the virus may also cause STL. Here, we looked into the frequency and seriousness of general and ENT-related symptoms in individuals with SARS-CoV-2 infection. The healthcare systems of the nations fighting the epidemic are under a significant amount of strain because of the sharp rise of SARSCoV-2-infected patients and infection-related mortality. Early identification and isolation of infected patients are necessary for success against the COVID-19 disease. Therefore, it is very important to determine the probabilities of all symptoms caused by the disease.^[17,18] Previous studies showed that COVID-19 disease causes a number of general symptoms, such as difficulty in breathing, myalgia, fatigue, fever, and cough. In more severe cases, it may lead to viral pneumonia and acute respiratory distress syndrome (ARDS), which may require hospitalization for treatment and follow-up. However, it may still result in death despite treatment.^[4,5]

In a meta-analysis involving five studies evaluating general and upper respiratory tract symptoms of patients hospitalized due to COVID-19 disease in Asian countries, it was reported that 85.6% of patients had fever, 68.7% had cough, and 39.4% had fatigue as the main symptom on admission to hospital, while 12.4% of patients had pharyngodynia, and 3.7% had nasal congestion and upper respiratory tract symptoms. The authors stated that rhinorrhea and sore throat are very rare in patients infected

with SARS-CoV-2, and STL was not seen. They warned that other upper respiratory tract symptoms, especially STL, are rare as the articles they examined included hospitalized SARSCoV-2-positive patients and, therefore, symptoms such as STL, nasal congestion, and sore throat may be complaints in patients infected with SARS-CoV-2.^[19] More than 80% of patients infected with SARS-CoV-2 survive the disease with mild symptoms, and patients with mild presentation can show a number of very different symptoms.^[20]

In the current study, the mean age was 50.35 ± 17.41 years; aged ranged from 18 to 70 years old. Sakalli et al found mean age 37.8 ± 12.5 years ranged in age from 18 to 65 years.^[3] Zięba N et al found the mean age was 43.98 years ± 13.47 SD & participants were 18 to 86 years old.^[16]

In our study, most of our patients were male (55%) compared to female (45%). Zieba N et al found female predominance (51.2%) and Sakalli et al also found female predominance (173 cases of total cases).^[3,16]

In our study, runny nose (81.6%), fever (74.8%), loss of sense of smell (73.6%), loss of sense of taste (67.6%), difficulty breathing (67.2%) & cough (59.2%) were the most common symptoms in our study. In the study done by Sakalli et al found the various frequencies of symptoms concluded were Headache (56.4%), Nasal obstruction (53.5%), Loss of sense of smell (51.2%), Sore throat (50.2%), Loss of sense of taste (47.1%) and Rhinorrhea (38.5%).^[3] A study in Italy found SARS-CoV-2 positive patients with mild symptoms, the most common symptoms were fever (55.9%), cough (60.4%), and fatigue (68.3%). The most common upper respiratory tract symptoms were nasal

congestion (41.1%), sore throat (31.2%), and STL (64.4%).^[21]

In our study, we found olfactory dysfunction (78.4%) was the most common, followed by 73.6% had taste disturbance, 67.2% had dyspnea, 59.6% had headache, & 46.4% had sore throat. The most frequent ENT-related symptoms of the patients were nasal obstruction (53.5%), loss of sense of smell (51.2%), sore throat (50.2%), loss of sense of taste (47.1%), and rhinorrhea (38.5%).^[3] Korkmaz et al., found the most common ENT symptoms were impairment or loss of taste, occurring in 41.37% of respondents, olfactory disturbances and complete loss of smell (37 and 9% of patients, respectively) and, finally, headache, reported by 37.1% of patients.^[22]

In a meta-analysis conducted by Tong et al., found that the average frequency of loss of sense of smell in 10 studies was 52.73% (29.64%–75.23%), and in nine studies that the average frequency of loss of sense of taste was 43.93% (20.46%–68.95%).^[23] In a study conducted on the Internet in patients with upper respiratory tract infection who had been tested for SARS-CoV-2, 68% of patients who were confirmed to have SARS-CoV-2 by PCR described loss of sense of smell and 71% described loss of sense of taste, while 16% and 17% of patients negative for SARS-CoV-2 described loss of the sense of smell and taste, respectively.^[24] The frequency of STL has been reported to be at least 10 times higher in SARS-CoV-2-positive patients than in uninfected individuals, and there is a strong association between loss of sense of smell and loss of taste.^[24]

The data obtained with the COVID-19 Anosmia Reporting Tool developed by the American

Academy of Otolaryngology-Head and Neck Surgery for clinicians indicated that 73% of 237 SARS-CoV-2-positive patients had loss of sense of smell at admission to hospital, and 26.6% of these patients had loss of sense of smell as the main complaint at the time of admission to hospital. It was reported that 85% of the patients who described loss of sense of smell recovered within the first 10 days, and the average recovery time was 7.2 days.^[25] In a study conducted in 417 SARS-CoV-2-positive patients with mild or moderate symptoms, 85.6% of patients described loss of sense of smell, 88.8% described loss of taste, and 79.6% of those with loss of sense of smell had anosmia and 78.4% reported that they had ageusia. The report also stated that 67.8% of patients with loss of sense of smell and 78.9% of patients with loss of sense of taste recovered to various degrees within an average of 8 days.^[26] Lechien et al. reported that STL was the main symptom in 11.8% of patients and that 79.7% of patients with STL described only loss of sense of smell without complaints of nasal obstruction or rhinorrhea in their study.^[26]

A survey done on smell and taste disorders in Milan, Italy found that 33.9% of patients had at least one taste or smell dysfunction while 18.6% of patients had both smell and taste dysfunction.^[27] In a study conducted by Yan C. et al., it was noted that 68% of patients had altered smell and 71% had altered taste.^[24] Jerome R. et al. studied 417 COVID 19 positive patients in mild to moderate category and found that 85.6% and 88.0% of patients reported Olfactory and Gustatory dysfunctions respectively.^[10] Chong Cui et al. studied 20 patients and found 3 patients to have Tinnitus which was reduced with betahistina.^[28]

Limitations of The Study

Our study was a single centre study. We took a small sample size due to short study period. There are more ENT symptoms associated with COVID infection that needs to be evaluated. After evaluating those patients we did not follow up with them for a long term and have not known other possible interference that may happen in the long term with these patients.

CONCLUSIONS

In our study, we found patients infected with SARS-CoV-2 may present to hospitals with a variety of general and ENT symptoms. Age, vertigo/dizziness, sore throats, and tinnitus was significantly related to frequency &

severity of ENT symptoms associated with COVID-19 infection. Symptoms related to the sense of smell, taste and hearing are some of the most common symptoms in the course of COVID-19, which is important in the therapeutic and epidemiological management of patients. STL is a prevalent illness, especially in patients with mild to severe symptoms, and it may arise without the development of other general and ENT-related symptoms associated with COVID-19 disease. Delayed diagnosis and treatment of symptoms, especially those related to the hearing organ, may result in greater permanent damage.

So further study with a prospective and longitudinal study design including larger sample size needs to be done to identify more symptoms of COVID -19 for early diagnosis.

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