Original article

Anosmia in COVID-19 Patients: A Study in a Tertiary Care Level Hospital, Dhaka, Bangladesh

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Abstract

Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The aim of this study was to describe the prevalence and features of anosmia in COVID-19 patients. We conducted a retrospective observational study in Shaheed Monsur Ali Medical College Hospital, Dhaka, Bangladesh in the Department of Medicine and Z H Shikder Women's Medical College Hospital, Dhaka, Bangladesh in the Department of ENT from June 2020 to December 2020.we enrolled all adult patients (>18 years) with confirmed COVID-19 who were examined at the infectious disease consultation or hospitalized in the hospital and who reported anosmia. Pregnant women, children (< 18 years), and patients with dementia (who cannot report functional symptoms) were excluded. We stopped the study follow-up on December 2020.Forty-three of 124 patients (34.55%) with confirmed COVID-19 reported anosmia and were included in this study. Among these 43 patients, the mean age was 47 (16) years and 27 (62.79%) were females and male 16(37. 21%).More than a third of our patients (37.53%, n = 17) were hospitalized, including two patients (4.65%) in the intensive care unit (ICU) and Home Stay Medication (23.26%, n=10). Four patients (7%) had oxygen saturation < 90% at admission, 12 patients (27.91%) needed oxygen therapy during hospitalization, and two patients (4.65%) died. COVID-19-related anosmia is a new description in the medical literature. Half of the patients with COVID-19 present with anosmia. Anosmia is associated with dysgeusia in more than 44.19% of cases. The outcome seems favorable in less than 28 days.

Keywords: Anosmia, COVID-19 Patients
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Introduction

Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). Fever, cough, fatigue, and myalgia are usually the main symptoms. The expression of COVID-19 ILI seems non-specific; no specific symptom can lead to suspecting a case without any notion of exposure.[1–6] A major cluster of COVID-19 began on approximately in the first week of April, 2020 in the city of Dhaka, Bangladesh. After clinical examination of the first patients, we noticed that many cases reported anosmia. The description of anosmia and other ENT symptoms is scarce with COVID-19. For instance, a recent review on COVID-19 by ENT specialists on March 26 emphasized that ENT symptoms were uncommon with COVID-19 as nasal congestion and rhinorrhea were observed in less than 5% of cases. However, they noticed that there were few reports of anosmia and dysgeusia with no real description of symptoms.[7] Recently, in April, descriptions of cases of anosmia in a multicentric cohort have been associated with COVID-19. [8–10] We aimed to describe the prevalence and features of anosmia in COVID-19 patients.

Methodology & materials

We conducted a retrospective observational study in Shaheed Monsur Ali Medical College Hospital, Dhaka, Bangladesh in the Department of Medicine and Z H Shikder Women's Medical College Hospital, Dhaka, Bangladesh in the Department of ENT from June 2020 to December 2020. We enrolled all adult patients (>18 years) with confirmed COVID-19 who were examined at

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the infectious disease consultation or hospitalized in the hospital and who reported anosmia. Pregnant women, children (< 18 years), and patients with dementia (who cannot report functional symptoms) were excluded. We stopped the study follow-up on December 2020. Diagnosis was confirmed by real-time PCR (RT-PCR) on respiratory samples, mainly nasopharyngeal swabs, sputum, bronchial aspirates, or bronchoalveolar lavage fluids. Viral RNA was extracted using the NucleoSpin® RNA Virus kit (Macherey-Nagel) according to the manufacturer's instructions, and amplified by RT-PCR protocols developed by Charité (E gene)[11] and the Institut Pasteur (RdRp gene)[12] on LightCycler 480 (Roche). Quantified positive controls were kindly provided by the French National Reference Centre for Respiratory Viruses, Institut Pasteur, Paris. Our national guidelines recommended home follow-up for non-hospitalized patients.[13] Non-hospitalized and discharged patients were called seven days (7 days) after the first symptoms and every week until recovery to monitor clinical outcome. Data required for the study was collected from the medical files of patients: age, sex, comorbidities, features of anosmia (date of apparition since symptom onset, duration of anosmia), other symptoms, physical signs, and outcome. Usual descriptive statistics were used. Categorical variables were expressed as numbers, percent-ages, or mean. Continuous variables were expressed as mean with standard deviation (SD). We aimed to describe the prevalence and characteristics of anosmia in patients with confirmed COVID-19.

Result

Forty-three of 124 patients (34.55%) with confirmed COVID-19 reported anosmia and were included in this study. Among these 43 patients, the mean age was 47 (16) years and 27 (62.79%) were females and male 16(37.21%). The most frequent comorbidities were asthma (20.93%, n = 9), arterial hypertension (25.58%, n = 11), and cardiovascular disease (23.26%, n = 10). Other comorbidities were less frequent (Table 1) and no patient had chronic obstructive pulmonary disease (COPD). Among the 43 patients, the mean duration of anosmia was 8.9 (6.3 [1–21]) days. Duration was (4-6) days for 29.73% (11/37) and (7-13) days for 35.14% (13/37) (Fig. 1); one patient (1/43) had not recovered at the end of the follow-up (after 28 days). Anosmia was never the first or second symptom to develop, but it was the third symptom in 38% (22/52) of cases. Anosmia developed 4.4 [1–8] days after infection onset. As for the other ENT symptoms, anosmia was associated with dysgeusia in 44.19% of cases (n = 19). Twenty- four patients had rhinorrhea (55.81%) and only 13 patients (30.23%) had nasal obstruction. Epistaxis, tinnitus, and hearing loss were uncommon (< 15%). As for other symptoms, seven symptoms were present in more than half of patients: fatigue (93.02%, n = 40), cough (86.05%, n = 37), headache (81.40%, n = 35), fever (72.09%, n = 31), myalgia (74.42%, n = 32), arthralgia (72.09%, n = 31), and diarrhea (52.16%, n = 22). Other symptoms were less present (Table 1). Fifteen (28%) patients received a clinical diagnosis of pneumonia with COVID-19. Their oxygen saturation was at 94.6% at admission. More than a third of our patients (37.53%, n = 17) were hospitalized, including two patients (4.65%) in the intensive care unit (ICU) and Home Stay Medication (23.26%, n=10). Four patients (7%) had oxygen saturation < 90% at admission, 12 patients (27.91%) needed oxygen therapy during hospitalization, and two patients (4.65%) died.

Table No 1: Distribution of the respondents according to medical history (n=43)

Variable			N
Medical history			
Age (Y): mean (SD)			47 (± 16)
Sex	Male	27	62.79%
	Female	16	37.21
Current smoking		6	13.95%
Comorbidities	Arterial hypertension	11	25.58
	Cardiovascular disease	10	23.26
	Diabetes	3	6.98
	Asthma	9	20.93
	COPD	5	11.63
	Malignancy	3	6.98
	Immunosupression	2	4.65

Table No 2: Distribution of the respondents according to Sign &Symptoms with anosmia (multiple response)

Sign/symptoms	n	%
ENT symptoms		
Rhinorrhea	24	55.81
Nasal obstruction	13	30.23
Epistaxis	5	11.63
Dysgeusia	19	44.19
Tinnitus	5	11.63
Hearing loss	3	6.98
Other symptoms		
Fever measured > 38 ◦C	31	72.09
Feeling of fever	13	30.23
Highest temperature (T◦C): mean (SD)	38.6 (± 0.8)	
Fatigue	40	93.02

Sign/symptoms	n	%
Myalgia	32	74.42
Arthralgia	31	72.09
Sore throat	9	20.93
Headaches	35	81.40
Conjunctival hyperemia	2	4.65
Tearing	3	6.98
Dry eyes	1	2.33
Blurred vision	3	6.98
Sneezing	14	32.56
Cough	37	86.05
Sputum production	9	20.93
Hemoptysis	3	6.98
Dyspnea	16	37.21
Respiratory rate > 22/min	8	18.60
Sat O2 at admission (%)	94.6 (± 4.6)	
Auscultation with crackling sounds	12	27.91
Nausea	15	34.88
Vomiting	2	4.65
Diarrhea	22	51.16
Abdominal pain	6	13.95

Table No 3: Distribution of the respondents according to Outcome with anosmia (n=43)

Outcome	n	%
Home Stay Medication	10	23.26
Hospitalization	17	39.53
Hospitalization in the intensive care unit	2	4.65
Oxygen therapy	12	27.91
Death	2	4.65

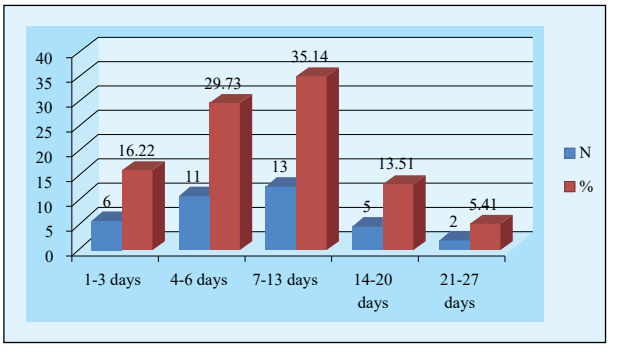

Fig No1: Recovery time for patients with anosmia (n = 37 patients, 4 patients did not remember duration until recovery and one patient did not recover after 28 days).

Discussion

A metacentric European study published on April 6 conducted by Lechien et al. reported 357 patients with olfactory dysfunction related to COVID-19.[10] We mostly used this publication to dis- cuss our results, as it is the only publication with a large cohort of patients with COVID-19-related olfactory dysfunction. The mean age of our population was 47 (16) years and 62% were females. The prevalence of asthma in our study was 10% and we did not have any COPD patient, which is uncommon in patients with COVID-19. Patients with anosmia seemed to be younger with a predominance of females, they had fewer comorbidities with a lower Charlson comorbidity index (< 1), and more often presented with asthma in comparison with the population usually described with COVID-19; the same population characteristics were described by Lechien et al. Until recently, ENT symptoms had not been reported with COVID-19, except for nasal congestion and rhinorrhea.[1–7] However, 43 (34.55%) of our 124 COVID-19 patients reported anosmia. Lechien et al. reported anosmia in 86% (*n* = 357/417) of their patients. This higher frequency may be explained by their population profiles, which were ambulatory cases that consulted at ENT consultations (patients with a mean age of 37 [11.4] years without cardiovascular comorbidities) and for whom it is probably easier to relate functional symptoms than patients with oxygen therapy or critical patients. Anosmia was therefore a frequent symptom in COVID-19 patients in our study and in this European study. However, few descriptions of ENT symptoms are available, especially in Asian studies. These differences between Asia and Europe should be discussed. We made several assumptions. First, the theoretical possibility of a mutation of SARS- CoV-2 viral genome associated with a clinical impact, but not yet population profiles, which were ambulatory cases that consulted at ENT consultations (patients with a mean age of 37 [11.4] years without cardiovascular comorbidities) and for whom it is probably easier to relate functional symptoms than patients with oxygen therapy or critical patients. Anosmia was therefore a frequent symptom in COVID-19 patients in our study and in this European study. However, few descriptions of ENT symptoms are available, especially in Asian studies. These differences between Asia and Europe should be discussed. We made several assumptions. First, the theoretical possibility of a mutation of SARS- CoV-2 viral genome associated with a clinical impact, but not yet described. On the other hand, it is difficult to precisely report ENT symptoms of critical patients. These symptoms may seem of less importance when considering the potential severity of the disease.[14] Finally, Lechien

et al. discussed the affinity of SARS-CoV-2 for tissues and individual possible genetic features. Their main argument was that the angiotensin-converting enzyme 2 (as receptor of SARS-CoV-2) can be specific to an ethnic group. Anosmia was associated with dysgeusia in 85% of cases and in more than half of cases with rhinorrhea (57%). However, 70% of our patients with anosmia did not present with nasal obstruction. This leads to suspecting another pathogenesis for anosmia than mechanical nasal obstruction. In addition, anosmia during viral rhinitis with nasal obstruction usually resolves within three days,[15] while we observed a mean duration of anosmia of nine days. The concept of anosmia after viral infection is known as post- infectious/post-viral olfactory loss (POL). Different kind of viruses can induce POL, including coronaviruses such as HCoV-229E.[16] However, medical literature data indicates that the duration of POL can be long: a study of 63 patients with POL reported that after one year 80% of patients had subjective recovery.[17] In our study, only one patient did not recover at the end of the study follow-up (after a follow-up of 28 days); 80% of our patients recovered within 14 days. Compared with POL, the outcome of COVID-19-related acute anosmia most frequently seems favorable in the short term. Our patients had the same other symptoms (other than ENT symptoms) as those reported in other studies.[1–6] However, just like Lechien et al., we observed that diarrhea was reported in more than 50% of patients. Except for one study (occurrence of 33%), the occurrence of diarrhea is < 20% in the medical literature.[18] The frequency of diarrhea seems to be high in patients with anosmia. One of our study limitations was the limited number of patients. However, our study is, to our knowledge, the main homocentric cohort of confirmed COVID-19 patients with anosmia in France and in the medical literature. Our results are similar to those published by the recent metacentric European study performed by Lechien et al.

Limitations of the study

This was a single centered study with a small sized sample. So, the findings of this study may not reflect the exact scenario of the whole country.

Conclusion and Recommendations

COVID-19-related anosmia is a new description in the medical literature. Half of the patients with COVID-19 present with anosmia. Anosmia is associated with dysgeusia in more than 44.19% of cases. The outcome seems favourable in less than 28 days. This notion needs to be communicated to the medical community.

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