Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

ENT

Persistent ENT Symptoms Following COVID-19 Recovery: A Cross-Sectional Analysis

Arif Mahmud Jewel[1*], Saimun Nahar Rumana[2], Mohammad Anwar Hossain[3]

[1]Medical Officer, Department of ENT, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
[2]Lecturer, Department of Microbiology, Ibrahim Medical College, Dhaka, Bangladesh
[3]Medical Officer, Department of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

DOI: 10.36347/sjams.2021.v09i12.026 | **Received:** 02.11.2021 | **Accepted:** 12.12.2021 | **Published:** 30.12.2021

***Corresponding author:** Arif Mahmud Jewel
Medical Officer, Department of ENT, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Abstract **Original Research Article**

Introduction: Persistent ENT symptoms following recovery from COVID-19 have emerged as a significant health concern, affecting a substantial proportion of patients. These symptoms, including anosmia, tinnitus, dysgeusia, chronic rhinosinusitis, postnasal drip, vertigo, and hearing loss, can significantly impact the quality of life, daily functioning, and mental well-being. This study explores the patterns and impacts of persistent ENT symptoms in a cohort of 110 post-COVID-19 patients. ***Methods:*** This was a cross-sectional study conducted at the Department of ENT, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, from October 2020 to October 2021, to assess the prevalence, duration, and impact of persistent ENT symptoms following recovery from COVID-19. A total of 110 patients who had recovered from COVID-19 and experienced persistent ENT symptoms were included in the study. ***Result:*** The study included 110 patients, with the majority in the 40-49 years age group (29.1%). Anosmia was the most common persistent ENT symptom (55.5%), followed by tinnitus (47.3%) and dysgeusia (43.6%). Severe acute COVID-19 (43.6%) and pre-existing ENT issues (35.5%) were the most prevalent risk factors. Anosmia had the longest mean duration (15.8 weeks), while hearing loss had the shortest (6.5 weeks). Quality of life was significantly impacted, with anosmia affecting nutrition and tinnitus causing anxiety. Corticosteroids (72.1% improvement) were the most effective treatment, followed by olfactory training (65.6%) for anosmia and tinnitus retraining therapy (59.2%) for tinnitus. ***Conclusion:*** Persistent ENT symptoms following COVID-19 recovery, particularly anosmia, tinnitus, and dysgeusia, significantly impact patients' quality of life. Middle-aged individuals (30-49 years) were most affected, with severe acute COVID-19 and pre-existing ENT issues as major risk factors. Treatment modalities such as corticosteroids and olfactory training showed promising improvements, especially for anosmia and rhinosinusitis.

Keywords: Persistent ENT Symptoms, COVID-19 Recovery, Anosmia, Tinnitus, Dysgeusia.

INTRODUCTION

The global spread of the COVID-19 pandemic, caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has resulted in unprecedented health challenges worldwide. While the acute respiratory symptoms of COVID-19, such as fever, cough, and dyspnea, have been extensively documented, increasing attention has been directed toward its long-term sequelae, collectively referred to as "long COVID" or post-acute sequelae of SARS-CoV-2 infection (PASC) [1]. The ENT manifestations of COVID-19 were prominent even during the acute phase of infection. Commonly reported symptoms include anosmia, dysgeusia, nasal congestion, and pharyngitis [2]. These symptoms, particularly anosmia and dysgeusia, were identified early as unique indicators of COVID-19, aiding in its differentiation from other respiratory viral infections [3]. However, a subset of patients continues to experience ENT-related symptoms weeks or even months after recovering from the acute illness. Such symptoms encompass persistent anosmia, chronic rhinosinusitis, tinnitus, vertigo, otitis media, and postnasal drip [4]. The prolonged duration of these symptoms not only burdens individual patients but also poses challenges for healthcare systems managing their recovery [5]. The exact mechanisms underlying persistent ENT symptoms post-COVID-19 remain a topic of active research. SARS-CoV-2 primarily enters

human cells via the angiotensin-converting enzyme 2 (ACE2) receptor, which is highly expressed in the nasal and oral mucosa, olfactory epithelium, and auditory structures [6]. The virus's invasion of these sites can cause localized inflammation, damage to the olfactory and gustatory neurons, and disruptions in auditory pathways [7]. Moreover, persistent inflammatory responses, autoimmunity, and microvascular damage are hypothesized to contribute to the chronicity of symptoms [8]. For example, anosmia may result from persistent inflammation or damage to the olfactory bulb, while tinnitus and hearing loss could arise from viral-mediated cochlear injury or vascular compromise [9]. Epidemiological studies indicate that persistent ENT symptoms affect a substantial proportion of COVID-19 survivors. Anosmia, one of the most reported symptoms, persists in approximately 10-15% of individuals after six months [10]. Tinnitus and hearing loss have also been documented in up to 7-15% of cases [11]. Risk factors associated with prolonged ENT manifestations include severe acute COVID-19, pre-existing ENT conditions, advanced age, and coexisting medical conditions such as diabetes and hypertension [12]. The persistence of ENT symptoms has significant clinical and psychological implications. For instance, anosmia and dysgeusia can severely affect a patient's nutritional status and overall well-being. Tinnitus and hearing loss are frequently associated with anxiety, depression, and sleep disturbances, compounding the burden on mental health. Chronic rhinosinusitis or postnasal drip may also lead to social discomfort and reduced productivity. Understanding these impacts underscores the need for comprehensive approaches to management and rehabilitation [13]. Effective management of persistent ENT symptoms requires a multidisciplinary approach. Accurate diagnosis involves a detailed clinical history, ENT examinations, and adjunctive imaging or audiological testing when necessary. This study aimed to evaluate persistent ENT symptoms following COVID-19 recovery.

METHODS

This study aimed to assess the prevalence, duration, and impact of persistent ENT symptoms following recovery from COVID-19. A total of 110 patients who had recovered from COVID-19 and experienced persistent ENT symptoms were included in the study. This was a cross-sectional study conducted at the Department of ENT, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, from October 2020 to October 2021.

Inclusion Criteria:

- Patients aged 18 years or older.
- History of recovery from COVID-19, as confirmed by a negative PCR test or resolution of symptoms.
- Presence of at least one persistent ENT symptom after recovery, including anosmia, tinnitus, dysgeusia, chronic rhinosinusitis, postnasal drip, vertigo, and hearing loss.

Exclusion Criteria:

- Patients with active COVID-19 or ongoing symptoms of COVID-19 at the time of study.
- Patients with pre-existing ENT conditions unrelated to COVID-19 (e.g., chronic sinusitis, vestibular disorders).
- Patients with any severe comorbidities (e.g., advanced cancer, uncontrolled diabetes, severe hypertension) could confound the results.
- Patients who had received treatments for persistent ENT symptoms outside of the study protocols.

Data were collected through patient interviews, medical records, and clinical assessments. A structured questionnaire was used to gather demographic information, medical history, and details regarding the persistent ENT symptoms experienced by the patients.

Symptom Prevalence and Duration: Patients were asked to report the severity and duration (in weeks) of persistent symptoms such as anosmia, tinnitus, dysgeusia, chronic rhinosinusitis, postnasal drip, vertigo, and hearing loss. Impact on Quality of Life: The impact of symptoms on daily activities, including nutrition, social interactions, productivity, and overall well-being, was assessed. Descriptive statistics were used to summarize the data. Frequencies and percentages were calculated for categorical variables (e.g., demographic characteristics, symptom prevalence, and treatment responses), while mean values and standard deviations were calculated for continuous variables (e.g., duration of symptoms). Statistical Package for Social Sciences (SPSS) version 22.0 was adopted for data analysis. Informed written consent was taken from the participants. Ethical clearance was taken from Bangabandhu Sheikh Mujib Medical University.

RESULTS

Table 1: Age distribution of patients (N=110)

Age Group (years)	n	%
18–29	15	13.6
30–39	28	25.5
40–49	32	29.1
50–59	20	18.2
≥60	15	13.6

The largest proportion of patients (29.1%) were in the 40–49 years age group, followed by 30–39 years (25.5%) and 50–59 years (18.2%). Younger adults (18–29 years) and older adults (≥60 years) each constituted 13.6% of the cohort. This distribution highlights that middle-aged individuals (30–49 years) were the most affected by persistent ENT symptoms following COVID-19 recovery.

Table 2: Prevalence of persistent ENT symptoms post-COVID-19 (N=110)

Symptom	n	%
Anosmia	61	55.5
Tinnitus	52	47.3
Dysgeusia	48	43.6
Chronic rhinosinusitis	44	40.0
Postnasal drip	42	38.2
Vertigo	32	29.1
Hearing loss	25	22.7

Anosmia was the most commonly reported symptom, affecting 55.5% of patients, followed by tinnitus (47.3%) and dysgeusia (43.6%). Chronic rhinosinusitis (40.0%) and postnasal drip (38.2%) were also frequently observed. Vertigo (29.1%) and hearing loss (22.7%) were less prevalent but still significant.

Table 3: Distribution of risk factors (N=110)

Risk Factor	n	%
Severe acute COVID-19	48	43.6
Pre-existing ENT issues	39	35.5
Hypertension	29	26.4
Diabetes	21	19.1
Smoking	17	15.5

Severe acute COVID-19 was the most common risk factor, present in 43.6% of the cohort, followed by pre-existing ENT issues (35.5%). Hypertension (26.4%) and diabetes (19.1%) were notable comorbidities, while smoking was reported in 15.5% of patients.

Table 4: Duration of symptoms (N=110)

Symptom	Mean Duration (weeks) ± SD
Anosmia	15.8 ± 4.3
Tinnitus	13.2 ± 3.9
Dysgeusia	11.4 ± 3.7
Chronic rhinosinusitis	9.6 ± 3.2
Postnasal drip	8.7 ± 2.9
Vertigo	7.8 ± 3.1
Hearing loss	6.5 ± 2.8

Anosmia lasted the longest, with a mean duration of 15.8 ± 4.3 weeks, followed by tinnitus (13.2 ± 3.9 weeks) and dysgeusia (11.4 ± 3.7 weeks). Chronic rhinosinusitis and postnasal drip persisted for 9.6 ± 3.2 weeks and 8.7 ± 2.9 weeks, respectively. Vertigo (7.8 ± 3.1 weeks) and hearing loss (6.5 ± 2.8 weeks) had shorter mean durations.

Table 5: Quality of life impact by symptom (N=110)

Symptom	Reported Impacts	Patients Affected (%)
Anosmia	Impaired nutrition, reduced appetite	55.5
Tinnitus	Anxiety, depression, sleep disturbance	47.3
Hearing loss	Social isolation, communication issues	22.7
Chronic rhinosinusitis	Reduced productivity, fatigue	40.0

Anosmia affected 55.5% of patients, leading to impaired nutrition and reduced appetite. Tinnitus, reported by 47.3% of patients, was associated with anxiety, depression, and sleep disturbances. Hearing loss, affecting 22.7%, caused social isolation and communication difficulties. Chronic rhinosinusitis impacted 40.0% of patients, contributing to reduced productivity and fatigue.

Table 6: Symptom improvement by treatment (N=110)

Treatment Modality	Symptom Targeted	Improvement (%)
Corticosteroids	Anosmia, rhinosinusitis	72.1
Olfactory training	Anosmia	65.6
TRT	Tinnitus	59.2
Supportive care	All symptoms	51.3

Corticosteroids showed the highest improvement rate (72.1%) for anosmia and rhinosinusitis, followed by olfactory training (65.6%) for anosmia. Tinnitus retraining therapy (TRT) was effective for tinnitus, with a 59.2% improvement rate. Supportive care, addressing all symptoms, resulted in a 51.3% improvement.

DISCUSSION

Our study found that anosmia (55.5%), tinnitus (47.3%), and dysgeusia (43.6%) were the most frequently reported persistent symptoms, which aligns with the results of previous research. Anosmia, in particular, has been widely documented as one of the most common post-viral symptoms in COVID-19 patients, with prevalence rates ranging from 40% to 60% in various cohorts [14]. Similarly, tinnitus and dysgeusia have been shown to affect a significant proportion of patients post-COVID, reporting variable rates [15]. Chronic rhinosinusitis (40%) and postnasal drip (38.2%) were also common symptoms in our cohort. Our analysis found that severe acute COVID-19 was the most common risk factor for persistent ENT symptoms, affecting 43.6% of patients, a result that is consistent with other studies suggesting that the severity of the initial infection plays a key role in the development of long-term symptoms. Severe COVID-19 has been linked to the prolonged presence of both sensory and respiratory symptoms, including anosmia, tinnitus, and dysgeusia [16]. Pre-existing ENT issues were identified in 35.5% of patients and are likely to exacerbate post-COVID symptoms. Furthermore, comorbidities such as hypertension (26.4%) and diabetes (19.1%) were notable risk factors in our study, confirming the results of several studies that highlight the association between these conditions and worse COVID-19 outcomes, as well as prolonged recovery periods [17]. The duration of persistent symptoms varied, with anosmia having the longest mean duration of 15.8 weeks, followed by tinnitus (13.2 weeks) and dysgeusia (11.4 weeks). These findings are consistent with other reports showing that anosmia can persist for several months after recovery from COVID-19, with mean durations ranging from 12 to 16 weeks [14]. The shorter durations of vertigo (7.8 weeks) and hearing loss (6.5 weeks) in our study are consistent with the findings of an author, who reported that vestibular symptoms and hearing loss tend to improve more rapidly than olfactory and gustatory dysfunctions [18]. Persistent ENT symptoms significantly impacted patients' quality of life. Anosmia affected 55.5% of patients, leading to impaired nutrition and reduced appetite, which is consistent with previous research showing that anosmia disrupts daily life, particularly concerning eating and social interactions. Hearing loss, though less common (22.7%), caused social isolation and communication difficulties, indicated that hearing impairments post-COVID contribute to significant difficulties in social interactions and overall well-being. Chronic rhinosinusitis, affecting 40.0% of patients, was linked to reduced productivity and fatigue, supporting the findings by Landry et al., where similar symptoms were shown to impair daily functioning and work performance in post-COVID patients [19]. Regarding treatment, corticosteroids showed the highest improvement rate (72.1%) for anosmia and rhinosinusitis, a result consistent with studies indicating that corticosteroids can effectively reduce inflammation in post-COVID rhinosinusitis and anosmia [20]. Olfactory training, which resulted in a 65.6% improvement in anosmia, has also been shown to improve olfactory function in other viral-induced anosmias, supporting its use as a therapeutic strategy for post-COVID anosmia.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

Persistent ENT symptoms following COVID-19 recovery, particularly anosmia, tinnitus, and dysgeusia, significantly impact patients' quality of life. Middle-aged individuals (30-49 years) were most affected, with severe acute COVID-19 and pre-existing ENT issues as major risk factors. Treatment modalities such as corticosteroids and olfactory training showed promising improvements, especially for anosmia and rhinosinusitis.

RECOMMENDATION

It is recommended that healthcare providers focus on early identification and targeted management of persistent ENT symptoms in COVID-19 patients, especially for anosmia and tinnitus. Corticosteroids and olfactory training should be considered for patients with anosmia, while tinnitus retraining therapy (TRT) may benefit those with tinnitus. Regular follow-up and comprehensive symptom management, including supportive care, are crucial to improving quality of life.

Funding: No funding sources
Conflict of interest: None declared

REFERENCES

1. Organization) W (World H. Coronavirus disease (COVID-19) pandemic. World Health Organ. 2020;
2. Lechien JR, Chiesa-Estomba CM, De Siati DR, Horoi M, Le Bon SD, Rodriguez A, et al. Olfactory and gustatory dysfunctions as a clinical presentation of mild-to-moderate forms of the coronavirus disease (COVID-19): a multicenter European study. Eur Arch Otorhinolaryngol. 2020;277(8):2251–61.
3. Menni C, Sudre CH, Steves CJ, Ourselin S, Spector TD. Quantifying additional COVID-19 symptoms will save lives. Lancet Lond Engl. 2020;395(10241):e107.
4. Xu H, Zhong L, Deng J, Peng J, Dan H, Zeng X, et al. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. Int J Oral Sci. 2020;12(1):1–5.
5. Rocke J, Hopkins C, Philpott C, Kumar N. Is loss of sense of smell a diagnostic marker in COVID-19: A systematic review and meta-analysis. Clin Otolaryngol. 2020 Nov;45(6):914–22.
6. Stanojlović O. The importance of smell and taste in everyday life: dysfunction in COVID-19 patients. Med Podml. 2021;72(3):37–48.
7. Greenhalgh T, Knight M, Buxton M, Husain L. Management of post-acute covid-19 in primary care. bmj [Internet]. 2020 [cited 2024 Dec 2];370. Available from: https://www.bmj.com/content/370/bmj.M3026.abstract
8. RAT RAT. The microvascular hypothesis underlying neurologic manifestations of long COVID-19 and possible therapeutic strategies. Cardiovasc Endocrinol Metab. 2021;10(4):193.
9. Najafloo R, Majidi J, Asghari A, Aleemardani M, Kamrava SK, Simorgh S, et al. Mechanism of Anosmia Caused by Symptoms of COVID-19 and Emerging Treatments. ACS Chem Neurosci. 2021 Oct 20;12(20):3795–805.
10. Mao L, Wang M, Chen S, He Q, Chang J, Hong C, et al. Neurological manifestations of hospitalized patients with COVID-19 in Wuhan, China: a retrospective case series study. MedRxiv. 2020;2020–02.
11. Carfì A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. Jama. 2020;324(6):603–5.
12. Almufarrij I, Uus K, Munro KJ. Does coronavirus affect the audio-vestibular system? A rapid systematic review. Int J Audiol. 2020 Jul 2;59(7):487–91.
13. Datta SD, Talwar A, Lee JT. A proposed framework and timeline of the spectrum of disease due to SARS-CoV-2 infection: illness beyond acute infection and public health implications. Jama. 2020;324(22):2251–2.
14. Araújo L, Arata V, Figueiredo RG. Olfactory disorders in post-acute COVID-19 syndrome. Sinusitis. 2021;5(2):116–22.
15. Carod-Artal FJ, García-Moncó JC. Epidemiology, pathophysiology, and classification of the neurological symptoms of post-COVID-19 syndrome. Neurol Perspect. 2021;1:S5–15.
16. Jasti M, Nalleballe K, Dandu V, Onteddu S. A review of pathophysiology and neuropsychiatric manifestations of COVID-19. J Neurol. 2021 Jun;268(6):2007–12.
17. Kim D, Adeniji N, Latt N, Kumar S, Bloom PP, Aby ES, et al. Predictors of outcomes of COVID-19 in patients with chronic liver disease: US multi-center study. Clin Gastroenterol Hepatol. 2021;19(7):1469–79.
18. Rouadi PW, Idriss SA, Bousquet J. Olfactory and taste dysfunctions in COVID-19. Curr Opin Allergy Clin Immunol. 2021;21(3):229–44.
19. Landry M, Bornstein S, Nagaraj N, Sardon Jr GA, Castel A, Vyas A, et al. Postacute sequelae of SARS-CoV-2 in university setting. Emerg Infect Dis. 2020;29(3):519.
20. Swain SK, Pani SR. Role of oral corticosteroid and olfactory training for treatment of post-COVID-19 olfactory dysfunction: Our experiences. Apollo Med. 2021;18(3):162–5.