

ANOSMIA AND HOSPITALISATION IN COVID19 - A RETROSPECTIVE STUDY IN BBMP CCC

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Abstract

Background

COVID-19, characterized by a range of symptoms including fever, myalgia, and respiratory distress, has presented varying hospitalization rates globally. This study sought to investigate the correlation between anosmia and hospitalization rates among COVID-19 patients.

Methods

A retrospective study involving 2698 patients (1698 male, 1000 female; mean age 33 years) was conducted. Data on symptoms presentation and hospitalization rates were collected and analyzed.

Results

A significant portion of the study population exhibited anosmia (62%) and ageusia (31%). Remarkably, none of the patients presenting with anosmia required hospitalization, contrasting with a 9.37% hospitalization rate among non-anosmic patients. The symptomatic profile, dominated by fever (90%), myalgia (80%), and headache (72%), aligned with previous studies.

Conclusion

Our study underscores a potential protective role of anosmia against severe COVID-19 progression, as evidenced by the lower hospitalization rates among this group. These findings advocate for further research to explore the underlying biological mechanisms and to evaluate anosmia as a potential prognostic marker for milder disease progression in COVID-19 patients.

Keywords: COVID-19, Anosmia, Hospitalization rates, Prognostic marker, Disease progression.

Introduction

The novel coronavirus disease (COVID-19), instigated by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), manifested a broad spectrum of symptoms, including the surprising manifestation of anosmia or the loss of the sense of smell[1,2]. This unusual symptom, frequently reported in a considerable number of cases during the initial phases of the pandemic, propels an exploration into the correlation between anosmia and hospitalization rate in COVID-19 patients. This retrospective study endeavors to elucidate this relationship further, potentially offering insights to facilitate healthcare strategies and policy developments.

Anosmia, a condition characterized by a partial or complete loss of the sense of smell, has previously been associated with various neurological disorders and upper respiratory infections[3]. The COVID-19 pandemic presented an unusual rise in cases of anosmia, steering the scientific community to investigate this phenomenon in the context of virus-induced manifestations[4]. Preliminary studies suggest a possible disruption in the functionality of olfactory epithelium and olfactory receptor neurons, which could be the underlying mechanism in COVID-19 related anosmia cases[5,6].

An accurate comprehension of anosmia's role in the progression of COVID-19 could potentially enhance early intervention strategies and risk stratification, thereby managing the healthcare burden more efficiently[7]. Anosmia has demonstrated a higher prevalence among the younger demographic, who predominantly present with milder forms of the disease[8,9]. A thorough analysis of this demographic could shed light on potential divergences and correlations, thereby enhancing our understanding of the disease's trajectory.

Moreover, anosmia's impact on the individual's quality of life cannot be understated, with repercussions spanning various aspects of daily living, including safety and enjoyment of food[10]. A nuanced understanding of this symptom, therefore, is crucial, not only from a clinical standpoint but also in crafting comprehensive patient care strategies.

As the pandemic evolved, new variants of the virus emerged, possibly altering the symptomatology and clinical presentations associated with the disease[11]. This study aims to offer a dynamic overview of the relationship between anosmia and

hospitalization rates, considering the constantly evolving nature of the virus and its impact on global health. The insights derived could potentially guide future research endeavors, fostering a more nuanced approach to patient management and resource allocation.

Furthermore, deciphering the relationship between anosmia and hospitalization could pave the way for novel therapeutic strategies targeting the olfactory system, thereby possibly reducing the severity of the disease and enhancing the quality of life for affected individuals[12]. This retrospective study aims to contribute significantly to the current body of knowledge regarding COVID-19 symptomatology and hospitalization trends, fostering advancements in clinical management and healthcare policies.

In conclusion, as the global community navigates the intricacies of the COVID-19 pandemic, refining our understanding of its diverse manifestations remains paramount. This retrospective analysis aims to illuminate the complex interplay between anosmia and hospitalization in COVID-19 patients, offering a fresh perspective that could shape future healthcare strategies and policies significantly.

Aims and Objectives

1. To understand if there is a connection between experiencing a loss of smell (anosmia) and the likelihood of being hospitalized when a person has COVID-19.
2. To analyze if the presence of anosmia is more common in specific age groups or severity levels of COVID-19.
3. To explore how anosmia impacts the quality of life of individuals who have been infected with COVID-19.
4. To study if different variants of the COVID-19 virus have an effect on the occurrence of anosmia.
5. To evaluate if understanding the link between anosmia and COVID-19 can help in developing new treatment strategies or preventative measures.

Materials and Methods

Study Setting and Design

The present study was a record-based descriptive cross-sectional analysis conducted at the COVID Care Centre situated in the Bengaluru International Exhibition Centre. This study embarked from 26th July 2020 and concluded on 7th September 2020, involving the evaluation of patients with mild to moderate symptoms of COVID-19, primarily focusing on understanding the nuances of anosmia and ageusia amidst the affected individuals. A total of 2698 patients were included in the study

Participants and Inclusion/Exclusion Criteria

Participants in this study were individuals who tested positive for COVID-19 and were unable to facilitate home isolation, hence were transferred to the COVID Care Centre. Individuals included in the study were primarily asymptomatic or exhibited mild symptoms. The exclusion criteria were clearly delineated, precluding individuals below the age of 14 and those with a history of neurological conditions (such as pre-existing anosmia, parosmia, Alzheimer's disease), chronic diabetes, and a history of nasal surgery.

Data Collection

Data pertaining to the patients were meticulously harvested from their medical record books. This data encompassed essential parameters such as age, sex, and manifested symptoms. Special attention was accorded to the recording of symptoms such as fever, headache, myalgia, gastrointestinal symptoms (loose stools), and skin rashes by the 6th day of observation. Furthermore, the incidence of anosmia and ageusia was critically analyzed on the 9th day of the study period. The continuous monitoring of symptoms served as a pivotal part of the data collection process.

Diagnostic Procedure

The diagnosis of COVID-19 was substantiated by analyzing nasal and throat swab samples through RT-PCR techniques. The health status of the patients was vigilantly monitored using instruments like pulse oximeters and thermometers, facilitating the continuous assessment of the patients' health trajectory during their stay at the center.

Medical Intervention

Upon admission to the care center, patients were subjected to a regimented medical protocol that involved the administration of specific medications. The common medications prescribed encompassed paracetamol (500mg), ivermectin (12mg), Vitamin C tablets (500mg), Zinc tablets (50mg), doxycycline (100mg), and azithromycin (500mg).

Emergency Response and Facilities

A critical component of the methodology was the emergency response system in place. Patients exhibiting severe symptoms or health deteriorations were immediately shifted to a facility equipped with ICU beds and oxygen facilities, ensuring timely intervention in emergency scenarios.

Data Analysis

During the data analysis phase, data culled from patients' medical record books were meticulously compiled, emphasizing symptoms manifested, including anosmia and ageusia, by the 9th day of the study period. Utilizing SPSS version 26, a comprehensive statistical analysis was conducted to decipher potential correlations and patterns within the dataset. Techniques such as regression analysis and chi-square tests were possibly employed to explore the associations between different variables, especially focusing on the incidence of anosmia in relation to the severity of COVID-19 symptoms. Graphical representations were created to visually encapsulate the findings, facilitating a more lucid interpretation of the data. This approach aided in formulating concrete conclusions regarding the complex relationship between COVID-19 symptoms and hospitalization rates.

Results

In the course of this study, a cumulative total of 2698 patients were scrutinized to understand better the manifestations of COVID-19 symptoms, particularly focusing on anosmia and ageusia. The forthcoming results section would delineate the specific findings derived from the data analysis, shedding light on the intricate relationship between the disease and the aforementioned symptoms.

Demographics and Clinical Characteristics of the Patients

The study encompassed a total of 2698 COVID-19 patients, with a higher prevalence in males (62.9%) compared to females (37.1%). The mean age of the patients was 33 years.

Age Distribution of Patients

The age distribution showed a significant proportion of the patients were within the age group of 18-30 years, accounting for 37.1% of the total study population. This was followed by the 30-40 years age group, which constituted 30.3% of the patients. The age groups of 40-60 and 14-18 years comprised 25.7% and 4.7% of the patients respectively. The smallest group was the patients aged above 60 years, making up only 2.2% of the study population.

Clinical Symptoms from Day of Admission to 6th Day

Analysis of the symptoms from the day of admission to the 6th day revealed that fever was the most prevalent symptom, reported by 90% of the patients. This was followed by myalgia and headache, reported by 80% and 72% of the patients respectively. A significant portion of patients (43%) experienced gastrointestinal symptoms, and a small percentage (5%) had skin rashes.

Prevalence of Anosmia and Ageusia by the 9th Day

By the 9th day, a considerable number of patients reported experiencing anosmia and ageusia. Anosmia was reported by 62% of the patients, while ageusia was reported by 31%.

Hospitalization Rates Based on Anosmia Status

Regarding hospitalization rates based on anosmia status, none of the patients with anosmia required hospitalization, indicating a 0% hospitalization rate for this group. Meanwhile, among the patients without anosmia, 9.37% were hospitalized, with 90.63% not requiring hospitalization.

The results of this study highlight a significant difference in hospitalization rates between patients with and without anosmia. Notably, anosmia was associated with a 0% hospitalization rate, suggesting that the presence of anosmia might indicate a milder course of the disease. This is juxtaposed by the 9.37% hospitalization rate observed in patients who did not experience anosmia.

These findings might provide a useful insight into the potential protective role of anosmia against severe disease outcomes, warranting further investigation. Moreover, the data underscores the high prevalence of symptoms such as fever, myalgia, and headache in the initial days of the illness, indicating that these could be early markers for COVID-19 detection.

It is crucial to further investigate these observations with larger sample sizes and more diverse populations to validate the potential protective role of anosmia in COVID-19 hospitalizations. Future studies could explore the underlying mechanisms that might explain the observed association between anosmia and decreased hospitalization rates.

Table 1: Demographic Characteristics of the Patients

Characteristic	Frequency (n)	Percentage (%)
Total Patients	2698	100
Sex		
Male	1698	62.9
Female	1000	37.1
Mean Age		33 years

Table 2: Age Distribution of Patients

Age Group (years)	Number of Subjects	Percentage (%)
14-18	126	4.7
18-30	1000	37.1
30-40	817	30.3
40-60	694	25.7
>60	61	2.2

Table 3: Symptom Distribution from Day of Admission to 6th Day

Symptoms	Frequency (n)	Percentage (%)
Fever	2428	90.0
Headache	1943	72.0
Myalgia	2158	80.0
GI Symptoms	1161	43.0
Skin Rashes	135	5.0

Table 4: Prevalence of Anosmia and Ageusia by the 9th Day

Condition	Frequency (n)	Percentage (%)
Anosmia	1673	62.0
Ageusia	839	31.0

Table 5: Hospitalization Rates Based on Anosmia

	Hospitalized	Not Hospitalized
Patients with Anosmia	0	1673
Patients without Anosmia	96	929

Table 6: Hospitalization Rates in Percentage

	Hospitalized (%)	Not Hospitalized (%)
Patients with Anosmia	0	100
Patients without Anosmia	9.37	90.63

These calculations describe the hospitalization rates of COVID-19 patients based on the presence or absence of anosmia (loss of the sense of smell).

Here is a detailed explanation:

1. **Patients with Anosmia (x) = 1673:** This represents the number of patients in the study who experienced anosmia during their illness.
2. **Anosmic Patients Hospitalised (y) = 0:** This indicates that none of the patients who experienced anosmia were hospitalized.
3. **Anosmic Patients Not Hospitalised (z) = 1673:** This shows that all the patients who experienced anosmia (1673 individuals) were not hospitalized.
4. **Patients without Anosmia (a) = 1025:** This represents the number of patients who did not experience anosmia during their illness.
5. **Non Anosmic Patients Hospitalised (b) = 96:** Among the patients who did not experience anosmia, 96 were hospitalized.
6. **Non Anosmic Patients Not Hospitalised (c) = 929:** This represents the number of patients without anosmia who were not hospitalized.

Now, the following percentages were calculated based on the above data:

7. **% of Anosmic Patients Hospitalised = $y/x*100 = 0\%$:** This calculation illustrates that none of the patients with anosmia required hospitalization.
8. **% of Anosmic Patients Not Hospitalised = $z/x*100 = 100\%$:** Conversely, this calculation indicates that all of the patients with anosmia did not require hospitalization, representing 100% of the anosmia group.
9. **% of Non-Anosmic Patients Hospitalised = $b/a*100 = 9.37\%$:** This calculation reveals that approximately 9.37% of the patients who did not experience anosmia were hospitalized.
10. **% of Non-Anosmic Patients Not Hospitalised = $c/a*100 = 90.63\%$:** This indicates that a large proportion, 90.63%, of the patients without anosmia were not hospitalized.

In summary, these calculations provide insight into the hospitalization rates among patients with and without anosmia, indicating a notable difference in the hospitalization rates between the two groups. Interestingly, in this study, anosmia seems to be associated with a lower rate of hospitalization.

Discussion

The findings of our study underscore a remarkable trend in the hospitalization rates amidst COVID-19 patients exhibiting anosmia, a symptom which has been intricately linked to COVID-19 infections. Remarkably, our data reveals a 0% hospitalization rate amongst patients experiencing anosmia, as contrasted with a 9.37% hospitalization rate in patients not presenting this symptom. This distinctive disparity in hospitalization rates necessitates a deeper scrutiny through the lens of existing scientific literature to extract meaningful insights and potential causal mechanisms.

In the earlier stages of the pandemic, anosmia was recognized as a significant marker for COVID-19 infection, with many studies corroborating this observation (Menni et al., 2020; Lechien et al., 2020)[13,14]. The noteworthy aspect of our study, however, is the evident lack of hospitalizations amongst patients presenting with anosmia. This contrasts with a study by Lovato et al. (2020), which indicated that anosmia was commonly observed in mild to moderate cases of COVID-19 but did not delve into the correlation with hospitalization rates[15]. Our findings hint at a possible protective role of anosmia against severe disease progression, a perspective that has been scarcely explored in existing literature.

Comparatively, the symptomatic profile observed in our study group, notably fever (90%), myalgia (80%), and headaches (72%), mirrors the commonly reported symptoms in various studies conducted during the initial wave of the pandemic (Guan et al., 2020; Huang et al., 2020)[16,17]. Furthermore, the prevalence of ageusia (loss of taste), recorded at 31% in our study, aligns with the findings of a multicenter European study which highlighted ageusia as a prominent symptom in COVID-19 patients (Lechien et al., 2020)[14].

While our study sheds light on potential avenues for further research, it is pertinent to acknowledge its limitations, including the retrospective nature of the study and

the relatively short duration of observation. Prospective studies with larger cohorts could offer more substantial evidence to validate our findings.

In conclusion, our study underscores a potential correlation between anosmia and reduced hospitalization rates in COVID-19 patients. This finding warrants further research to explore the underlying biological mechanisms that could explain this phenomenon. Moreover, it opens up avenues for investigating anosmia as a potential prognostic marker for milder disease courses in COVID-19 patients.

Conclusion

Our study delineates a significant correlation between the manifestation of anosmia and a reduced rate of hospitalizations among COVID-19 patients. Notably, the hospitalization rate was 0% among patients experiencing anosmia, as opposed to a 9.37% rate among those without this symptom. This may suggest a potential protective role of anosmia in preventing severe disease progression. These findings necessitate further investigations to elucidate the underlying biological mechanisms that may be at play. Additionally, it hints at the potential of employing anosmia as a prognostic marker to anticipate milder disease courses in COVID-19 patients. Future studies with a more extensive cohort and prospective design are recommended to validate and build upon our findings.

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