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Anosmia in COVID-19: The Indian Experience

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ABSTRACT

This research aims to estimate the prevalence of anosmia in confirmed COVID-19 patients of the Indian population, to study the time of onset of anosmia, the duration of anosmia and whether the presence of anosmia is a significant symptom of COVID 19. The study group (N = 834) included all patients who were positive for Covid-19 and were symptomatic.145 of these 834 patients suffered with anosmia. All 145 patients were questioned in detailed and the findings were analyzed. In 29.7 % of patients, anosmia was a presenting or first symptom, a large proportion (91.7%) developed anosmia within 1 week of onset of symptoms. Anosmia alone with no other symptoms was seen in 12.2% of cases. In most cases (68.3%) anosmia was associated with ageusia. 81.3% had anosmia for less than one week.77.9% stayed in hospital for less than one week suggesting an overall good prognosis for COVID-19 infection. A delayed recovery of anosmia (more than 10 days) was seen in 33.33% of severe cases, 24.17% of moderate cases and 16.34% of the mild cases. Following the findings in this report, we want to conclude that anosmia was an early symptom, anosmia was the only symptom of COVID-19 in few cases, concomitant ageusia was seen in most participants and that fever was the most common associated symptom. In the majority of patients anosmia lasted for less than a week and resolved without any sequelae.

***Keywords*:** Coronavirus; SARS-CoV-2; COVID-19; Symptoms; Anosmia; Ageusia.

1. INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) pandemic has caused a global catastrophe around the world [1,2]. There is growing evidence that olfactory dysfunction particularly anosmia is a significant symptom [3]. Anosmia can occur alone or may be accompanied by other symptoms of COVID-19 [4]. In the Non-COVID scenario causes of anosmia may be local due to allergic rhinitis, polyps, neoplasms, or inhalational medication misuse, or neurological due to infarction, head injury, or a brain neoplasm [5]. However, in patients with COVID-19, the pathogenic mechanism of olfactory dysfunction and its clinical features remain uncertain [3,6]. Although olfactory loss is a typical symptom of multiple viral respiratory infections, recent reports indicate that in COVID-19 infection prevalence rates may be much higher [7]. Studies have recorded that there is a wide spectrum of olfactory disturbance prevalence ranging from 5% to 98%in COVID-19 patients in different parts of the world [8]. Studies worldwide have shown a marked difference in the prevalence of anosmia, anosmia duration, and prognostic outcome in patients with COVID-19 [9]. Therefore, it is important to determine whether these differences are due to differences in racial characteristics, climatic variations or due to the method of evaluation (objective / subjective).

The COVID-19 pandemic began worldwide in late 2019, but India saw only a significant rise in cases between July and August 2020 [10]. The Indian Health Ministry has included anosmia and ageusia as symptoms in the COVID-19 clinical management guidelines. The guidelines state that anosmia or ageusia precedes the onset of respiratory symptoms. The objective of this study is to present the Indian experience of anosmia. This study was conducted at Nellore Government General Hospital, one of five COVID-19 tertiary care

hospitals in Andhra Pradesh, South India. In addition, Andhra Pradesh is one of the states to be worst affected by the COVID-19 in India [11].

2. MATERIALS AND METHODS

This research was conducted at the Nellore Government General Hospital, Andhra Pradesh, South India, a tertiary care hospital dedicated for the treatment of COVID-19 cases. There was an expedited institutional ethical committee approval. The research group included all patients who had a positive Covid-19 test (RT-PCR) and were symptomatic. All patients were given written informed consent to be part of this study. All patients were prepared to be part of the study in order to document. The research included patients aged more than 15 years. Patients with a prior history of nasal surgery, allergic rhinitis, sinusitis, nasal polyposis, head injury or other chronic nasal condition were excluded. Also excluded were patients with anosmia prior to the diagnosis of Covid-19.

The study involved a total of 834 patients who were admitted between 17 July 2020 and 15 October 2020, all of whom were RT-PCR positive for COVID-19. 145 of these 834 patients had anosmia and all of these 145 patients were questioned in depth and the findings were analyzed. All patients were asked about the presence or absence of anosmia, in addition to the main concerns. After being tested negative, COVID positive patients who had anosmia were approached again and a detailed history of anosmia was elicited once again. The information was recorded and evaluated in the Excel sheet.

3. RESULTS AND DISCUSSION

Of the 834 patients with confirmed COVID-19145 patients (18%) reported anosmia and were included in this study. Among these, a majority of subjects (26.9 %) were aged 25-34 years, followed by 35-44 years (21.4 %). Males accounted for a higher percentage (61.4 %) than females (38.6 %) (Table 1). In 43 (29.7 %) patients, anosmia was the first or presenting symptom and a significant proportion (91.7%) developed anosmia within 1 week of onset of symptoms. In addition, anosmia was associated in certain subjects with ageusia (68.3%) (Table 2). It was found that the common symptoms associated with anosmia were fever (72.4 %), cough (53.8 %), myalgia (49.7 %) and breathlessness (34.5 %) (Table 3). 81.3% had anosmia for less than or equal to 1 week. The mean duration of anosmia was 6.6 days. Late recovery was seen in 26 out of 145 (17.93%) cases. The most common co-morbid conditions found in patients were hypertension (24.1 %) and diabetes mellitus (20.7 %). Hypothyroidism was seen in 4.8% (Fig. 1). Most patients were found to have mild illnesses (73.1%), while 26.9% had moderate to severe illnesses. The typical medications prescribed were Ivermectin (60.7%), Doxycycline (59.3%) and Azithromycin (35.9 %). Remdesivir was given to 22.7% of patients as summarised in Table 4, while steroid was administered to 26.2% of patients. 23.4 % of patients were given low molecular weight Heparin (Table 4). The majority of patients (31.0%) remained in the hospital for 4-6 days, while 22.1% stayed in the hospital for 10 days or more.53.8% of patients have stayed in the hospital for less than one week (Fig. 2).

Table 1: Age and gender distribution of study population (N=145)

Variable			No.of patients	Percentage
1	**Age group (Years)**			
	(a)	15 – 24	8	5.2
	(b)	25 – 34	39	26.9
	(c)	35 – 44	31	21.4
	(d)	45 – 54	23	15.9
	(e)	55 – 64	24	16.6
	(f)	65 & above	20	13.8
2	**Gender**			
	(a)	Male	89	61.4
	(b)	Female	56	38.6

Table 2: Anosmia as a presenting symptom, its onset and associated with ageusia (N=145)

Variable			No.of patients	Percentage
1	**Presenting Symptom**			
	(a)	Yes	43	29.7
	(b)	No	102	70.3
2	**Onset within one week**			
	(a)	Yes	133	91.7
	(b)	No	12	8.3
3	**Associated with Ageusia**			
	(a)	Yes	99	68.3
	(b)	No	46	31.7

Table 3: Other associated symptoms of anosmia (N=145) in COVID-19 patients.

Symptom	No. of patients	Percentage
Fever	105	72.4
Cough	78	53.8
Myalgia	72	49.7
Breathlessness	50	34.5
Sore throat	44	30.3
Headache	22	15.2
Diarrhoea	7	4.8

After more than 6 months into the COVID-19 pandemic, it has become obvious from reports all over the world that Anosmia is a significant symptom of COVID-19. Studies

worldwide, however, have shown a marked difference in the percentage of individuals with anosmia, anosmia duration, comorbidities, age distribution and prognostic significance [12]. 145 out of 834 (18%) COVID-19 patients confirmed by RT-PCR reported anosmia and were included in this study. Studies in other countries and continents have reported a wide variation in the percentage of patients who had anosmia in COVID -19. Mao et.al reported anosmia in 5.1% of their patients. Klopfenstein et al found anosmia in 47% [13]. A major European study reported 76.9% anosmia prevalence. In our study prevalence of anosmia was 18%.The majority of the subjects were 25-34 years of age (26.9%), followed by 35-44 years of age (21.4%), and the proportion of men was higher than that of women. There is a high risk of severe COVID-19 disease in adults of any age with underlying comorbidities [14].

Table 4: Severity of COVID and medicines prescribed (N=145)

Variable			No.of patients	Percentage
1	**Severity of COVID**			
	(a)	Mild	106	73.1
	(b)	Moderate	27	18.6
	(c)	Severe	12	8.3
2	**Common Medicines prescribed**			
	(a)	Ivemectin	88	60.7
	(b)	Doxycycline	86	59.3
	(c)	Azithromycin	52	35.9
	(d)	Steroid	38	26.2
	(e)	Low Molecular Weight Heparain	34	23.4
	(f)	Remdesivir	33	22.7

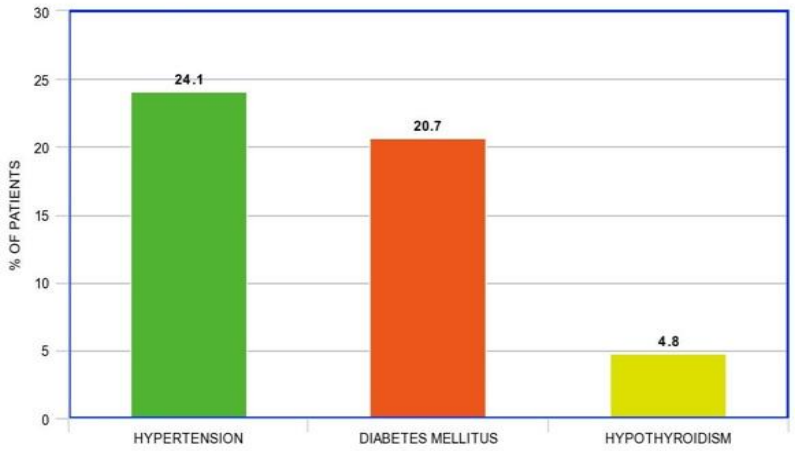

Figure 1. Co-morbid conditions (N=145) in COVID-19 patients of studied population

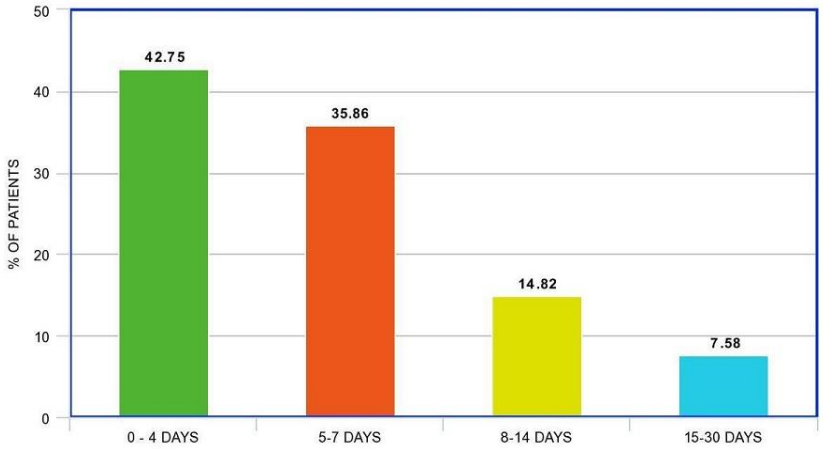

Figure 2. Duration of hospital stay in days (N=145)

In 29.7% of patients, anosmia was a presenting symptom and a significant proportion of 91.7% developed anosmia within 1 week. In a review study [15] in 64.5% of subjects anosmia was the earliest symptom, this is much higher than that in our study. One of reasons for this is that many patients realised that they had anosmia only after questioning, so it is possible that there was underreporting. In 68.3% subjects' anosmia was associated with ageusia

and the typical associated symptoms were fever, cough, myalgia and breathlessness. In certain other studies [13] an 85% association with dysgeusia was observed. Importantly, virological examination of patients with mild symptoms of COVID-19, including anosmia in certain patients, has reported high levels of viral shedding, indicating that these patients can still transmit the disease and isolation of such patients is advised for containment of the disease [16].

104 of the145 anosmia patients (71.72%) had mild disease *i.e* saturations more than 95%, 29 (20%) had moderate disease *i.e* saturations between 90% to 94%and 12 (8.27%) had severe disease *i.e* saturations below 90%. A mean duration of 6.6 days of anosmia was observed in our study, with a range from 2 days to 30 days. 26 patients out of 145(17.9%) had late recovery from anosmia for more than 10 days, of which 14 had anosmia for more than 2 weeks. All patients regained their olfactory function by 30 days unlike study on recovery of anosmia done by Kosugi et al [17] where patients were followed up for 31 days and 13.2% of their patients did not regain their olfactory function in this period. Researchers confirmed in another study that nearly 80 % of patients reported improvement in smell loss within a few weeks of onset, with recovery appearing to plateau after 3 weeks) [18].

A late recovery was seen in 33.33% of severe cases, 24.17% of moderate cases and 16.34% of the mild cases. It is observed that increased severity of disease is associated with late recovery from anosmia. The most prevalent comorbidity was hypertension (24.1%) followed by diabetes mellitus (20.7%). Hypothyroidism was seen in 4.8%. In a multicentric European trial by Jerome R. Lechien et al, hypertension was a more common comorbidity than diabetes, which correlates with the results of our study. The prescribed medications were Ivermectin, Doxycycline and Azithromycin, and 22.7 % of patients were given the Remdesivir while 26.2% of patients were given steroid.23.4 % of patients were administered low molecular weight Heparin. Remdesivir, low molecular weight Heparin and steroids were given mostly in patients with moderate and severe disease. The majority of patients (31.0%) remained in the hospital for 4-6 days, while 22.1% stayed in the hospital for 10 days or more. 53.8 % of the patients remained in the hospital for less than a week.

Study limitations: Using an objective tool for assessment of anosmia might have yielded better results. Paucity of experienced professionals and simultaneous surge of cases was a limitation as far as a detailed history and examination were concerned. However, to our knowledge, our research is the main monocentric cohort in India and in the medical literature of reported COVID-19 patients with anosmia.

4. CONCLUSION

To conclude, in 29.7 % of patients, anosmia was observed as a presenting symptom and a significant proportion (91.7%) developed anosmia within 1 week of onset of symptoms. Anosmia was associated with ageusia in 68.3% of patients and the other associated symptoms were fever (72.4.%), cough (53.8%), myalgia (49.7%) and breathlessness (34.5%). The mean duration of anosmia was 6.6 days and 17.9% had a delayed recovery (more than 10 days). In 100% of the cases olfaction was restored within a month. This is reassuring information to patients who are alarmed by this peculiar symptom. Since anosmia is such a classical symptom of COVID-19 which is easily recognized, awareness about this fact can aid early diagnosis and there by enable isolation and prevent community transmission.

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6. AUTHORS' CONTRIBUTIONS

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work. All the authors are eligible to be an author as per the international committee of medical journal editors (ICMJE) requirements/guidelines.

7. Conflicts of Interest: None

8. ETHICAL CONSIDERATIONS:

This study took place at the Nellore Government General Hospital in Andhra Pradesh, South India, a tertiary care hospital specialising in COVID-19 treatment. There was an expedited institutional ethical committee approval

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