

## ORIGINAL RESEARCH

# Requirement of oxygen in patients with COVID-19 presenting with Anosmia and dysgeusia- A study

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### ABSTRACT

**Introduction:** Medical oxygen supplementation plays a very critical role in managing the patients affected with Covid-19. This COVID-19 disease is known to be caused by a virus named SARS-CoV-2 and the major symptoms include fever, cough and dyspnoea. Therefore, this study has been carried out to explore the requirement of oxygen therapy among covid-19 patients that were associated with dysgeusia and anosmia. **Materials and Method:** Out of 650 individuals suffering from acute respiratory illness examined, 500 people were tested positive and 150 stayed negative. All the details were efficiently collected from the patients files that include various clinical signs and symptoms related to acute respiratory illnesses. These signs and symptoms include their age, fever, headache, dry cough, fatigue, dysgeusia, anosmia, dyspnoea, diarrhoea and abdominal pain. Correlation of anosmia and dysgeusia with requirement of oxygen among covid-19 patients was analysed. Data were collected and analysed using SPSS software and simple frequencies of the data are presented as medians and the difference between the groups are evaluated by Mann-Whitney U test. **Results:** Anosmia and dysgeusia was present in 247 and 253 covid 19 positive cases which accounts to 44% and 46 % cases respectively which was statistically significant among covid-19 symptoms. 3 % of patients with anosmia and 4% patients with dysgeusia among COVID -19 cases required oxygen therapy which was statistically insignificant. All Patients presenting with anosmia and dysgeusia as covid 19 symptoms had good prognosis and majority were treated with home isolation.

**Conclusion:** In this study, the requirement of oxygen in COVID -19 patients having symptoms of anosmia and dysgeusia was statistically insignificant and the disease in such patients had better prognosis.

**Keywords:** covid-19, hypoxemia, oxygen requirement, anosmia, dysgeusia.

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### INTRODUCTION

The disease COVID-19 which is universally known as a viral pneumonia that was originally discovered in Wuhan, China on 11<sup>th</sup> March 2020. The world health organisation has officially announced this outbreak as the first corona virus pandemic.<sup>1</sup> This COVID-19 disease is known to be caused by a virus named SARS-CoV-2 and the major symptoms include fever, cough and dyspnoea. There are few minor symptoms that include alteration of taste and smell, various gastrointestinal symptoms, headache and cutaneous manifestations.<sup>2-4</sup> Since it was a pandemic outbreak, this disease has spread across over 200 countries and has resulted in more than one million deaths as on September 2020. On an average, almost 29% of the affected patients require hospital admission in requirement of oxygen therapy. 12% of the

hospitalised patients received mechanical ventilation and 88% died.<sup>5</sup> there is literature availability that mentioned about anosmia and dysgeusia as the critical symptoms of SARS-CoV-2 infections. Anosmia is majorly associated with other respiratory tract infections and it is quite confusing whether it is a consequence of nasal obstruction and congestion or it is directly related with SARS-CoV-2 infection.<sup>6</sup> Almost over 86% of the affected patients who had faced mortality had complications related to respiratory failure.<sup>7</sup> There are many studies mentioned that hypoxemia is independently associated with many cases of in-hospital mortality and therefore in-time administering oxygen is seemed to be essential. The mortality reported in young patients reported to be low and the proportion of admitted young patients noted to be slightly lower than the older people.<sup>8</sup>

Therefore this study has been carried out to explore the requirement of oxygen therapy among CoVid-19 patients that were associated with dysgeusia and anosmia.

**MATERIALS AND METHODOLOGY**

After obtaining the prior approval from the institutional ethical committee, the study began with 500 patients who were admitted in the tertiary care hospital, Navi Mumbai, Maharashtra. There are certain inclusion criteria that were followed in this study which include those patients who were diagnosed with Covid-19 based on WHO interim guidance where in nasal and pharyngeal samples were obtained & tested using RT-PCR and those patients who were aged between 18 – 65 years old. Few exclusion criteria been followed that include those patients who were tested negative in RT-PCR and pregnant women. Out of the 650 individuals suffering from acute respiratory illness examined, 500 people were tested positive and 150 stayed negative. All the details were efficiently collected from the patients files that include various clinical signs and symptoms related to acute respiratory illnesses. These signs and symptoms include their age, fever, headache, dry cough, fatigue, dysgeusia, anosmia, dyspnoea, diarrhoea and abdominal pain. Correlation of anosmia and dysgeusia with requirement of oxygen among covid-19 patients was analysed. Data were collected and analysed using SPSS software and simple frequencies of the data are presented as medians and the difference between the groups are evaluated by Mann-Whitney U test.

Categorical variables were presented as percentages and the difference between the groups were tested using Chi-square test.

**RESULTS**

All the socio-demographic details were relatively tabulated in table – 1. The age range of the study participants included in this study randomly from 18-65 years of age. The study participants include male and female wherein male showed slight predilection when compared with females. Considering the occupation of the study participants, there was more number of participants as employees from other areas followed participants in home without a job. Table – 2 showed various clinical signs and symptoms of the study population. Almost all the study participant experienced fever, cough and headache. No significant differences between the groups were observed. Table – 4 correlated the various clinical signs and symptoms associated with COVID – 19 myalgia and odynophagia were most commonly encountered followed by dysgeusia and anosmia. Anosmia was present in 247 cases among which 44% cases were covid-19 positive which was statistically significant among covid-19 symptoms. Dysgeusia was present in 253 cases among which 46% cases were covid-19 positive which was statistically significant among covid-19 symptoms. 3 % of patients with anosmia and 4% patients with dysgeusia among COVID cases required oxygen therapy and had better outcome all had good prognosis (table 5

**Table: 1 Socio-Demographic details of the study participants**

Parameters	Population n=650, (100%)	COVID – 1 positive n=500, (76.9%)	COVID – 19 negative n=150, (23.1)	P – value
<b>Demographics</b>	<b>Age 18 – 30</b>	79 (15.83%)	5 (3.41%)	0.01
	<b>Age 31-50</b>	372 (74.37%)	98 (65.62%)	
	<b>Age 51-65</b>	49 (9.8%)	46 (30.97%)	0.97
	<b>Males</b>	294 (58.84%)	87 (58.25%)	
	<b>Females</b>	206(41.16%)	63 (41.75%)	
<b>Occupation</b>	<b>Employees</b>	250 (50%)	87 (58%)	0.15
	<b>Health care workers</b>	90 (18%)	18 (12%)	
	<b>Merchant</b>	20 (4%)	3 (2%)	
	<b>Home</b>	100 (20%)	28 (9%)	
	<b>Retired</b>	33 (6.5%)	6 (4%)	
	<b>Unemployed</b>	2 (0.5%)	1 (1%)	
	<b>Students</b>	5 (1%)	6 (4%)	

**Table: 2 Clinical signs and symptoms observed in study population**

Parameters	Population n=650, (100%)	COVID – 19 positive n=500, (76.9%)	COVID – 19 negative n=150, (23.1)	P – value
<b>Fever</b>	<b>Yes</b>	585 (90%)	445 (89%)	0.37
	<b>No</b>	65 (10%)	55 (11%)	
<b>Cough</b>	<b>Yes</b>	572 (88%)	445 (89%)	0.39
	<b>No</b>	78 (12%)	55 (11%)	

<b>Headache</b>				
<b>Yes</b>	546 (84%)	420 (84%)	126 (84%)	0.94
<b>No</b>	104 (16%)	80 (16%)	24 (16%)	
<b>General</b>				
<b>Yes</b>	455 (70%)	365 (73%)	100 (67%)	0.35
<b>No</b>	195 (30%)	135 (27%)	50 (33%)	

**Table: 3 Clinical signs and symptoms associated with COVID – 19**

Parameters	OR	P – value
Age older than 40 years	1.7	0.04
Arthralgia	2.5	0.00
Conjunctivitis	1.8	0.03
Myalgia	2.0	0.00
Odynophagia	1.7	0.04
Anosmia	1.9	0.02
Dysgeusia	2.3	0.00

**Table: 4 Clinical signs and symptoms with significant differences between the groups**

Parameters	Population N=650	COVID- 19 positive N=500	COVID – 19 Negative N=150	P – value
<b>Arthralgia</b>				0.00
<b>Yes</b>	370 (57%)	325 (65%)	64 (43%)	
<b>No</b>	280 (43%)	175 (35%)	86 (57%)	
<b>Myalgia</b>				0.00
<b>Yes</b>	422 (65%)	355 (71%)	84 (56%)	
<b>No</b>	228 (35%)	145 (29%)	66 (44%)	
<b>Odynophagia</b>				0.05
<b>Yes</b>	403 (62%)	330 (66%)	84 (56%)	
<b>No</b>	247 (38%)	170 (34%)	66 (44%)	
<b>Anosmia</b>				0.02
<b>Yes</b>	247 (38%)	220 (44%)	42 (28%)	
<b>No</b>	403 (62%)	330 (66%)	108 (72%)	
<b>Dysgeusia</b>				0.00
<b>Yes</b>	253 (39%)	230 (46%)	42 (28%)	
<b>No</b>	397 (61%)	270 (54%)	108 (72%)	

**Table: 5 Oxygen requirements among COVID-19 cases in patients with anosmia and dysgeusia**

Parameters	Population N=650	Hospitalization	P – value
		Oxygen requirement	
		Yes	
<b>Anosmia</b>	247 (38%)	3%	0.00
<b>Dysgeusia</b>	253 (39%)	4%	0.00

**DISCUSSION**

In our study, it has been found that oxygen therapy is detrimentally required in hospitalized COVID-19 patients aged between 18-65 years old. The success rate of oxygen therapy is reportedly high, and the risk of developing various complications is relatively low. Associated signs and symptoms such as fever, dyspnoea, chest distress, respiratory rate and albumin and globulin levels at the time of admission are mostly the independent factors that are associated with the requirement of oxygen therapy. Our study showed that on an average 64% of hospitalized COVID-19 patients under 65 years old are in need of oxygen therapy but the failure rate of oxygen therapy is reported below 10%, and the mortality rate is only

2.8% among oxygen therapy patients. Moreover, the length of hospitalization was relatively longer in the oxygen therapy group. This observation is reasonable since those that required oxygen were seemed to be at a much worse phase. So, the difference in the length of hospitalization was only approximately calculated to be 1.5 days. Therefore, it is instigated that once oxygen therapy is administered in time, most of the young patients have a good clinical outcome. Thus, triaging patients who are in need oxygen therapy and therefore administering oxygen therapy in time in order to avoid oxygen debt is far more critical in order to enhance the clinical outcome. Additionally, the risk for COVID-19 patients under 65 years old to develop complications was relatively low. Among the study

participants who had fulfilled the inclusion criteria, more than 90% received antivirals, more than half were administered antibiotics, and approximately 20% were treated with corticosteroids. All of these medicines pose a greater risk of developing liver impairment.<sup>9</sup> Moreover, the hyper-inflammation induced by COVID-19 could also damage liver function is yet another mechanism that has been explained in the literature.<sup>10</sup> The current study found that anosmia and dysgeusia was present in 247 and 253 covid 19 positive cases which accounts to 44% and 46 % cases respectively which was statistically significant among covid-19 symptoms. 3 % of patients with anosmia and 4% patients with dysgeusia among COVID -19 cases required oxygen therapy which was statistically insignificant. All Patients presenting with anosmia and dysgeusia as covid 19 symptoms had good prognosis and majority were treated with home isolation. In a similar study, Klopfenstein T et al<sup>11</sup>reported that 47% patients with confirmed COVID-19 reported anosmia and 37% were hospitalised. 85% had dysgeusia and the mean duration of anosmia was 8.9 days and 98% of patients recovered within 28 days. Anosmia was present in half of European COVID-19 patients and was often associated with dysgeusia. Foster KJ et al<sup>12</sup>found that anosmia was related with decreased hospitalization, ICU admission, and mechanical ventilation rates compared with the lack of anosmia. Silu M et al<sup>13</sup> also supported that there is less incidence of anosmia in severe form of COVID-19 infection. Dyspnoea, chest distress and respiratory rate are independent factors associated with the factors in predicting the requirement of oxygen therapy. All these symptoms were reported to be earlier signs of respiratory failure. In this study, it has been found that more patients had respiratory rates of more than 20 times/minute at admission in the oxygen therapy group (30.7% vs. 19.5%,  $p < 0.001$ ). Thus, respiratory rate and respiratory signs should be closely monitored. Additionally, low albumin and globulin levels were also independent risk factors. A similar result was also found in Middle East respiratory syndrome (MERS) patients.<sup>14</sup> It is believed that albumin mirrors the baseline nutritional status of patients and is associated to poor clinical outcome for hospitalized patients.<sup>15</sup> Good nutrition could support the body with immunity in order to clear the virus and enhance the disease recovery.<sup>16</sup> Also, serum globulin is generated by the immune system and liver set to play a vital role in host protection against infection.<sup>17</sup> In an earlier study, it has been found that the antibody titre was independently associated with the severity of COVID-19.<sup>18</sup> Previous studies showed that comorbidities, such as chronic obstructive pulmonary disease (COPD), diabetes, hypertension and malignancy, and the number of comorbidities were also related to poor prognosis in COVID-19 patients.<sup>19,20</sup> But, in our study, no comorbidity was a risk factor for oxygen therapy after adjustment. Thus, we think the major

explanation for the inconsistent result might be that the included patients in our study were relatively young and that cigarette smoking exposure was not significant enough to influence the clinical outcome in COVID-19 patients. Whereas a previous study suggested that smoke might be the major reason why male COVID-19 patients had poorer clinical outcomes<sup>17</sup> no sex difference was found in our study.

## CONCLUSION

In this study, the requirement of oxygen in COVID -19 patients having symptoms of anosmia and dysgeusia was statistically insignificant and the disease in such patients had better prognosis. Hence in other words patients having anosmia and dysgeusia in COVID -19 rarely have oxygen requirement which will help in triaging of patients when needed.

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