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The Prevalence of Anosmia in COVID-19 Patients and the Associated Factors

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Abstract **Original Research Article**

The aim of this retrospective study was to evaluate the prevalence of anosmia in COVID-19 patients. We also focused on the day of onset of anosmia and the time of recovery from it. In addition, we examined the impact of smoking on the clinical progression of anosmia. One hundred patients participated in the study, with the mean age being 34 years. Regarding gender, 55% of the patients were female, while 45% were male (45%). Furthermore, 64% of the patients were smokers, while 36% were non-smokers. The prevalence of anosmia among the sample was 77%, and the mean of the initial day of anosmia was three days (according to the day of the PCR test). Moreover, the mean of the recovery period in terms of weeks was two weeks, and 76 patients who had anosmia recovered in three months.

Keywords: Anosmia in COVID-19, smoking.

INTRODUCTION

Coronaviruses, which belong to the Coronaviridae family, cause respiratory infection in mammals, such as bats, camels, and masked palm civets, and in avian species [1]. In humans, coronavirus infections may be asymptomatic or accompanied by fever, cough, shortness of breath, and gastrointestinal irritation [2, 3]. In certain cases, particularly among the elderly and immunocompromised individuals, coronavirus infections may lead to severe pneumonia and, subsequently, death [4]. On 30 January 2020, the World Health Organization (WHO) declared a global emergency over the novel coronavirus outbreak in Wuhan, a city in China's Hubei province [6]. On 24 February 2020, the WHO acknowledged that SARS-CoV-2 had the potential to spread globally and cause a pandemic [6].

The olfactory disturbances in COVID-19 patients have drawn worldwide attention to an extremely important, yet often neglected, sense. Smell plays a fundamental role in our lives, with regard to both safety (such as detecting the odors of burning materials, gas leaks, or spoiled food) and the quality of life (such as by facilitating pleasure while eating, helping in the maintenance of proper hygiene, and playing a sensory role in interpersonal relationships).

In this retrospective study, we used a questionnaire to evaluate the percentage of anosmia in 100 patients who had tested positive for COVID-19. The information gathered included their age, gender, onset of anosmia, time of recovery from anosmia, and smoking habit as an associated factor.

METHODS

This retrospective study included 100 patients who had tested positive for COVID-19 in the period between September 2020 and March 2021. A questionnaire was used to document the necessary information. The questions focused on age, gender, occurrence of anosmia (yes or no), the day on which anosmia occurred (according to the day of the PCR test), the recovery week, and smoking habit as an associated factor.

The exclusion criteria included patients with chronic illness, children, and pregnant women.

During research, we noticed that the COVID-19 patients who suffered from anosmia could determine the exact day on which they had lost their sense of smell but could only remember the week in which they had started to regain their sense of smell.

RESULTS

One hundred patients participated in the study, with their mean age being 34.85±11.38. There were 55 female patients (55%) and 45 male patients (45%). Furthermore, 64 patients were smokers (64%), while 36 were non-smokers (36%). The prevalence of anosmia among the sample was 77 (77%), and the mean of the initial day of anosmia was 3.45±1.79 days. Moreover, the mean of recovery in terms of weeks was 2.88±3.02 weeks, and 76 patients who had anosmia recovered in three months. The details of the sample are presented in Table [1].

Table-1: Sample characteristics

Variables	N(%)
Gender • Male • Female	 45(45) 55(55)
Smoking status • Smoker • Non-smoker	 64(64) 36(36)
Anosmia • Yes • No	 77(77) 23(23)
Age (M±SD)	34.85±11.38
initial day of Anosmia (M±SD)	3.45±1.79
Recover in week (M±SD)	2.88±3.02
Three month recovery (N=77) • Yes • No	 76 1

To study the association between gender, smoking status, and anosmia, a Chi-square test of independence was carried out as follows:

Table-2: Association between gender, smoking status, and anosmia

Variables		**Anosmia**		**df**	**X2**	**Sig**
Gender Female 47 Smoking status No	(85.5) 8(14.5)	Yes N(%)	No N(%)	30	(66.7) 0.019	15(33.3) 0.090
		1 4.933	0.026 Male			
		49(76.6)	15(23.4) 1			
	Yes	28(77.8)	8(22.2)			

The result of the Chi-square test revealed a statistically significant association between gender and anosmia (X^2(1)-4.933, p=0.026), indicating that the proportion of females with anosmia (85.5%) was higher than that of males with anosmia (66.7%). Meanwhile, no statistically significant association was found between smoking status and anosmia (X^2(1(0.019), p=0.090).

Furthermore, Kaplan-Meier was used to estimate the survival function of the weeks of anosmia recovery with respect to gender and smoking status; the results showed that the mean weeks of survival (time to regain the sense of smell) for females was lower (2.68) as compared to males (3.21). However, this difference was not statistically significant (log Rank test (p=0.867). Similarly, the mean weeks of survival for non-smokers were lower (2.63) as compared to smokers (3.33). This difference was also not statistically significant (log Rank test (p=0.629).

To study the effects of gender, smoking status, and age on the weeks of recovery, a Cox regression was used. The result showed that the omnibus tests of model coefficients were not statistically significant (X^2(3)=1.392, p=0.707). This indicated that the null model was not statistically significant as compared to the beginning model. Moreover, the results, which are presented in Table (3), indicated that no single predictor was significantly associated with the weeks of anosmia recovery

Table-3: Cox regression results of effect of gender, age, and smoking status on the weeks of anosmia recovery

Predictors	B	Wald	Hazard ratio	Sig
Gender	-.752-	1.043	.307	.472
Age	-.006-	.264	.608	.994
Smoking	-826.-	1.217	270.	438.

DISCUSSION

Anosmia is not only present in COVID-19 patients but also in patients with other respiratory diseases such as influenza, parainfluenza, Epstein–Barr virus, picornavirus, and rhinovirus. However, global studies have demonstrated that the prevalence of anosmia was 10.2-fold higher in COVID-19 patients than in non-COVID-19 patients. During previous pandemics, such as the severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), anosmia was rarely reported [7]. This suggests that anosmia is a potential indicator of SARS-CoV-2 infection and, thus, may be useful for the screening and early identification of COVID-19 patients, particularly asymptomatic ones. Some countries, such as the UK and US, have used anosmia as an indicator for preventive measures, requiring COVID-19 patients with anosmia to commence self-isolation [7].

Mendonca *et al*. (2021) found a significantly higher proportion of patients with olfactory dysfunction in a group of patients with mild flu symptoms; they concluded that olfactory dysfunction may indicate a good prognosis. In line with this finding, we also found a high percentage of olfactory dysfunction, indicating a mild and good prognosis of COVID-19 among the selected patients. It must be noted that the majority of our patients were young, healthy adults with a mean age of 34.85 [8].

CONCLUSION

The majority of the study participants who had contracted COVID-19 experienced olfactory dysfunction. Thus, it can be determined that anosmia is a constant and paramount symptom in COVID-19 patients and should therefore be considered when obtaining the history of suspected patients. We also found a higher proportion of olfactory dysfunction in male patients; however, olfactory dysfunction exhibited no significant association with smoking status.

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