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Incidence of Hyposmia and Hypoguesia in COVID-19 Patients in Kirkuk

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ABSTRACT

Deficits in smell and/or taste are possible neurological manifestations of coronavirus disease-2019 (COVID-19). The study aims to determine the incidence of hyposmia and hypoguesia in patients infected with COVID-19 in Shifa-14 Hospital, Kirkuk, Iraq. Data for this study were taken from the patients' registries. The results showed that out of 117 patients, 73 (62.4%) had hyposmia or hypoguesia, or both. Most of the patients were males 71 (60.7%) with different age groups. The majority of patients was smokers 72 (61.5%) and had mild infection 61 (52.1 %). Men, smoking, and disease seriousness had a vastly significant association with hyposmia and hypoguesia. We concluded that lack of smell and taste was a common symptom of COVID-19. Males, smoking, and severe infection were risk factors hyposmia or hypoguesia in the COVID-19 cases.

Key words: COVID-19, Symptoms, Hyposmia , Hypoguesia, Infection

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INTRODUCTION

In December of 2019, the first patient with COVID-19 was discovered in Wuhan, China [1]. It was acknowledged a global pandemic by WHO in early 2020 [2,3]. This disease causes disturbances in respiratory function that may lead to severe progressive pneumonia and multi-organ failure that may sometimes lead to death [4,5]. On the other hand, the first confirmed infection of COVID-19 in Iraq was recorded in Najaf Governorate for a student from Iran on February 24, 2020. Then 4 infections out of one family in the city of Kirkuk on the 25th of the same month and year, and it were found that they also had a travel history to Iran [6]. Lately, certain researchers have suggested that infected people with COVID 19 have neurological dysfunction, such as losing smell sense (hyposmia) and the sense of tasting (hypoguesia), with a prevalence of 5.1% - 98% for hyposmia, and 5.6% - 90.3% for hypoguesia [7-10]. WHO has therefore enlisted those signs in defining the condition? Those symptoms are suggested to be related to neuronal invasion and may be connected with harsh forms of COVID 19 [11,12]. Few studies (especially in Iraq), focused on the variance in the incidence of these signs in COVID-19 patients between smokers and non-smokers and investigated the link between them in addition to some basic characteristics. Therefore, the study aimed to describe the incidence of hyposmia and hypoguesia among Kirkuk governorate patients, to estimate the relationship of these disorders with smoking status, disease harshness, as well as other basic characteristics.

METHODS

This cross-sectional study was conducted in Al-Shifa Hospital-14, Kirkuk, Iraq during May and June 2021. This hospital has been designated as a health centre for to care of Covid-19 patients from all areas of Kirkuk Governorate. This epidemic by the Kirkuk Health Directorate (Northern Iraq). Patients were confirmed to have COVID-19 by positive actual polymerase chain reaction (PCR) results on nasopharyngeal or oropharyngeal swabs. The research retrospectively analyzed the prevalence of hyposmia and hypoguesia in persons having COVID-19. There were 130 persons infected with COVID-19 when conducting the study, only 117 persons were adopted in this study. Those who had previous problems with smell and taste as well as very old age were excluded. Data regarding age, gender, smoking and harshness of infection were taken out of each patient positively tested. The severity of infection was categorized as follows: A - mild infection including patients with mild symptoms of covid-19 without evidence of pneumonia B - moderate infection when the patient had a fever with pneumonia C - severe infection involving patients with: shortness of breath RR >30/m in adults, blood oxygen saturation < 93% in ambient air, PaO2/FiO2 <300, finally lung infiltration >50% of the lung field within 24 hours [13]. To analyze the data of the current study, version 26 of the statistical program IBM-SPSS was used. Categorical variables were compared by using Chi-Square test. The P-value was considered a statistically significant difference if it was less than 0.05.

RESULTS

117 patients were enrolled in this study. Table 1 shows the incidence rates of hyposmia, hypoguesia, or both which was 62.4 % among covid 19 infected persons. Those who had hyposmia reached 67 (57.3%) patients.

Table 1: Distribution of Covid 19 patients according to the incidence of hyposmia, hypoguesia.

Covid-19 infected people	Frequency	Percentage %
With hyposmia or hypogeuia or both	73	62.4
Without hyposmia and hypogeuia	44	37.6
Total	117	100

In Table 2, the patients were divided according to their age into 3 groups. The age group of patients with hyposmia from 21 to 40 years was greater than those with hyposmia in other groups; ≥ 21 and 41 -60 years old. As for the gender of patients with hyposmia, males 50 (42.7%) were significantly more than females 17 (14.5%). Most of our patients were smokers 72 (61.5%), and more than half of them 53 (45.3%) had hyposmia as well as the largest proportion of patients with mild symptoms. Although the severe cases were the lowest 16 (13.7 %), but the incidence of hyposmia among them was the highest 14 (12.0%). In between two groups of patients (with or without hyposmia), there was a significant statistical difference (P value>0.05) with regard to the following characteristics: gender, smoking, and severity of the disease.

Table 2: Basic characteristics and their relationship to hyposmia in patients with COVID-19.

Characteristics		With Hyposmia N=67 (57.3%)	Without Hyposmia N= 50 (42.7%)	Total N=117 (100%)	P Value
Age	≥ 21	4 (3.4)	5 (4.3)	9 (7.7)	0.71
	21-40	43 (36.6)	30 (25.6)	73 (62.4)	
	41-60	20 (17.1)	15 (12.8)	35 (29.9)	
Gender	Male	50 (42.7)	21 (17.9)	71 (60.7)	0
	Female	17 (14.5)	29 (24.8)	46 (39.3)	
Smoking	Yes	53 (45.3)	19 (16.2)	72 (61.5)	0
	No	14 (12.0)	31 (26.5)	45 (38.5)	
Severity	Mild	29 (24.8)	32 (27.4)	61 (52.1)	0.015
	Moderate	24 (20.5)	16 (13.7)	40 (34.2)	
	Sever	14 (12.0)	2 (1.7)	16 (13.7)	

In Table 3 there were statistically significant differences between two groups of infected persons (with or without hypoguesia) with regard to the following characteristics: gender (0.000), smokers (0.000), and infection severity (0.018). Whereas, in terms of patient age groups (0.653), there was no statistically significant difference between the two groups (p value >0.05).

Table 3: Basic characteristics and their relationship to hypoguesia in patients with COVID-19.

Characteristics		With Hypoguesia N=69 (59.0%)	Without Hypoguesia N=48 (41.0%)	Total N=117 (100%)	P Value
Age	≥ 21	4 (3.4)	5 (4.3)	9 (7.7)	0.653
	21-40	44 (37.6)	29 (24.8)	73 (62.4)	
	41-60	21 (17.9)	14 (12.0)	35 (29.9)	

Gender	Male	52 (44.4)	19 (16.2)	71 (60.7)	0
	Female	17 (14.5)	29 (24.8)	46 (39.3)	
Smoking	Yes	55 (47.0)	17 (14.5)	72 (61.5)	0
	No	14 (12.0)	31 (26.5)	45 (38.5)	
Severity	Mild	30 (25.6)	31 (26.5)	61 (52.1)	0.018
	Moderate	25 (21.4)	15 (12.8)	40 (34.2)	
	Sever	14 (12.0)	2 (1.7)	16 (13.7)	

DISCUSSION

Smell and taste disorders (STD) are closely related to COVID-19 infection. There are indications that hyposmia with or without hypogeusia is associated with underlying infection with COVID-19.The exact mechanism by which COVID-19 infection leads to STD is not elucidated to date, because a complete objective evaluation of olfaction is currently not possible due to the infectious behaviour of COVID-19 [14-16]. However, there are two pathogenic possibilities that may cause olfactory disturbances in COVID-19, one of which is infecting and destructing the olfactory epithelium supportive cells causing the local homeostasis to be inflammated and changed. The other is infecting or immune-mediated damaging endothelial cells and vascular pericytes, resulting in decreased blood flow and inflammation. In both situations, the recruited inflammatory cells, released cytokines, and generated neurotoxic compounds might affect the neuronal signalling indirectly. Obstruction of the olfactory cleft and potentially direct infection of the nerve cells are also possible [17,18]. One of the important entrances for SARS-CoV-2 to the infected person's body is the mouth. Cell entry factors for SARS-CoV-2, such as angiotensin-converting enzyme 2 (ACE2), transmembrane serine protease 2 (TMSP2), and furin are expressed in cells of the oral epithelium, taste buds, and salivary glands [19-21]. In addition, an worldwide interdisciplinary team undertook research to better understand the function of COVID-19 infection in the oral cavity. The results of the study concluded that COVID-19 has the potential to infect salivary glands and mouth cells. These cells which are infected shelter reproducing viruses, making them a cause of pathogens to disseminate to other members [22]. Impaired tasting sense and decreased sense of smell, both neurosensory disturbances, are publically known early symptoms in people infected by COVID-19 [23]. Covid-19 infection causes damage to the taste sensory cells. In humans, ACE2 is found in tasting sensory buds, oral mucosa, in addition to the dorsal tongue and gums having stratified squamous epithelium [24]. Existing data on the mechanisms required in the pathogenesis disturbances of taste in COVID-19 are limited. Taste abnormalities in COVID-19 may hypothetically be caused by indirect damage to taste receptors caused by epithelial cell injury and following local inflammation, similar to what has been postulated for olfactory diseases [25,26]. Hypoguesia is a high incidence symptom in patients with COVID-19. In some people infected, these signs persist long after the infection has cleared and lead to a deterioration in their quality of life [27]. This study included larger proportions of males compared to females, which reflects the previously reported clinical character of COVID-19 [28,29]. Also, showed that men with hyposmia and hypoguesia were more prevalent than women. With regard to age, there was no significant difference between age groups with regard to disturbances in the senses of smell and taste, and this is consistent with result similar to previous study [30]. The current study revealed a higher frequency of smokers (61.5%) in people having COVID-19. This result is parallel to many previous studies [31,32]. Smoking has been connected with serious or dire outcomes and augmented possibility of entering ICU and death in COVID-19 infected people [33]. A statistically significant correlation was found between STD and smoking status. This may be because smoking can impair your ability to smell and taste in a reversible way [34]. Severe disease showed a statistically significant relationship with incidence hyposmias and hypoguesia. This could be due to their smoking status as a provocative factor that worsens the health status of COVID-19 patients.

CONCLUSIONS

Symptoms of hyposmias and hypoguesia are common among patients with COVID-19 and mustn't be underestimated within the existing pandemic. Reduced sense of smelling and tasting was more in men, smokers and severe infection. They can be considered as risk factors.

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