

Features of Anosmia in COVID-19 moderate and severe cases

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ABSTRACT

Since the COVID-19 pandemic has started, numerous people have noted numerous ENT signs (Anosmia, nasal clog, sore throat, runny nose and dysgeusia) alongside other general side effects like fever and headache. Current evidence suggests close relationship between COVID-19 with smell and taste disorder. We aim to review the features of anosmia in a relation with COVID. The present study is a multi-center prospective study, we recruited 300 patients with laboratory confirmed COVID-19 infection, admitted into three tertiary referral quarantine hospitals to receive medical treatment Both the olfactory threshold and the odor discriminative ability were assessed. All tests were conducted by the same clinician. The patient's symptoms, clinical and laboratory data will be recorded to assess the course of the disease and these data will be correlated with smell testing We revealed that Seventy three patients out of 300 patients (47%) with confirmed COVID-19 reported anosmia and were included in this study No significant differences between patients with anosmia and those without anosmia as regard most of symptoms, other clinical signs. 70% of patients with anosmia were associated with dysgeusia 50 % of patients with anosmia recovered within 13 days, 85 % within 22 days. Regarding timing of onset, anosmia appeared (before, at same time and after) of the other COVID symptoms (10 %, 65% and 25%) respectively.



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1. INTRODUCTION

Since the COVID-19 pandemic has started, numerous people have noted numerous ENT signs (Anosmia, nasal clog, sore throat, cerebral pain, runny nose and dysgeusia) alongside other general side effects like fever and headache [1], [2]. For some patients, anosmia and dysgeusia are the introducing side effect of COVID-19 [3]. Olfactory brokenness has huge antagonistic impact on wellbeing, security, and personal satisfaction [4].

COVID is the most widely recognized cause today. However, the ability to smell can also be affected by neurological diseases, metabolic diseases, toxicity, and certain conditions, such as sinus infections or brain tumors [5], [6]. Several possible mechanisms are suggested for the SARS-CoV-2 anosmia that may cause anosmia as: Olfactory Cleft Obstruction, Effect on Olfactory Bulbs, Olfactory Epithelium Injury [7].

Aim of the work

To review features of anosmia in COVID patients

2. Patient and Method

The current study is a multi-center prospective study, 300 with laboratory confirmed COVID-19 infection patients were included, admitted into three tertiary referral quarantine hospitals to receive medical treatment.

Setting: Minia University Hospital, Minia Insurance Hospital and Minia Pulmonology Hospital. Approval of the research ethical committee of the faculty of medicine was obtained and written informed consents were obtained from all participants clarifying the purpose of the study.

Both the olfactory threshold and the odor discriminative ability were assessed. Two bottles at each test concentration Two identical squeezable bottles were presented to the patient: one containing the n-butanol solution, Starting from the major dilution, and the other filled with deionized water, testing began with the lowest concentration, the patient had to decide which smelled stronger The patient was then asked to close one nostril and squeeze the bottle immediately below the other, reporting which of the two bottles smelled most. The threshold was identified when the subject gave the correct answer four times. In case of error, the next most concentrated solution was given to the patient., it was repeated for the 2 nostrils. All tests were conducted by the same clinician. Severity of the disease was classified into mild, moderate, or severe according to clinical and radiological finding of CT chest General information regarding age, gender, and medical history, including the history of underlying systemic conditions, and COVID-19 severity were obtained from the hospital clinical records and then confirmed by the patient. The patient's history of the timeline of the onset of chemosensory symptoms of anosmia and/or dysgeusia was obtained using the open-ended questionnaire. The patient's symptoms, clinical and laboratory data will be recorded to assess the course of the disease and these data will be correlated with smell testing.

Statistical analysis was performed using SPSS version 16. Data are presented as means \pm standard deviations (SDs). Student's t-test, analysis of variance (ANOVA), and the Bonferroni post hoc test were used for comparisons. The level of statistical significance was $P \leq 0.05$.

3. Results

Anosmia is one of the main features of COVID-19 and the underlying disease of the patient may also influence its occurrence and development.

300 patients with confirmed COVID-19 were included in this study. the mean age was 66.2 (\pm 10) years and 159 (53%) were females. 72 % of patients complained from cough, 46.3 % from sore throat, 33.7 % complained from fever, 33% from headache, 27.7 % from anosmia, 26.7 from diarrhea, 56% from malaise. Seventy three out of 300 patients (47%) with confirmed COVID-19 reported anosmia and were included in this study. Among these 73 patients, the mean age was 66.21 \pm 10.07 years and 39 (53%) were females. Ten of them died. 70% of patients with anosmia were associated with dysgeusia. 50 % of patients with anosmia recovered within 13 days, 85 % within 22 days. Regarding timing of onset, anosmia appeared (before, at same time and after) of the other COVID symptoms (10 %, 65% and 25%).

Table one presents the differences in the frequency of symptoms between patients with anosmia (group 1) and without it (group 2). Patients with anosmia presented with a higher frequency of rhinorrhea (59 patients in group 1 versus. 155 patient in group 2, $p = 0.022$), fever (35 patients versus 63 patients, $p = 0.001$), cough (59 patients versus 155, $p = 0.022$), diarrhea (22 versus 56, $p = 0.259$), malaise (13 versus 43, $p = 0.870$), and

headache (18 versus 81, $p < 0.001$), than those without anosmia

Table 1: Detailed information about COVID 19 infection among the studied population according to anosmia

Characteristic	With anosmia (n =73)	Without anosmia (n =227)	p- value
Fever			
Positive	35(48.2%)	63(28.1%)	0.001*
Negative	38(51.8%)	164(71.9%)	
Cough			
Positive	59(81.9%)	155(68.7%)	0.022*
Negative	14(18.1%)	72(31.3%)	
Sore throat			
Positive	32(44.6%)	106(47.0%)	0.709
Negative	41(55.4%)	121(53.0%)	
headache			
Positive	18(25.3%)	81(35.9%)	0.079
Negative	55(74.7%)	142(64.1%)	
Malaise			
Positive	13(18.1%)	43(18.9%)	0.870
Negative	60(81.9%)	180(81.1%)	
Vomiting			
Positive	22(31.3%)	59(26.3%)	0.381
Negative	51(68.7%)	178(73.7%)	
Diarrhea			
Positive	22(31.3%)	56(24.9%)	0.259
Negative	51(68.7%)	171(75.1%)	
Nasal congestion			
Positive	35(48.2%)	63(28.1%)	0.001*
Negative	38(51.8%)	164(71.9%)	
Rhinorrhea			
Positive	59(81.9%)	155(68.7%)	0.022*
Negative	14(18.1%)	72(31.3%)	

The most frequent comorbidities were COPD(18.1% in patients with anosmia vs. 22.6% in patients without anosmia $p = 0.240$), diabetes (54.2% vs. 22.6% $p < 0.0001$), CHF (24.1% vs. 23.0%, $p = 0.847$), renal impairment (28.9% vs. 23.0%, $p = 0.291$) hepatic impairment(8.4% vs. 18.0%, $p = 0.040$), hypertension (25.3% vs. 31.8%, $p = 0.272$), bronchial asthma (2.4% vs. 3.7%, $p = 0.732$) and cancer (6.0% vs. 7.4%, $p = 0.253$) (table 2)

Table 2: Past history among the studied population according to anosmia

Characteristic	Cases (n =73)	male cases (n =23)	female cases (n =50)	p- value
Diabetes mellitus				
Positive	39(54.8%)	16(73%)	23(46.0%)	0.027*
Negative	34(45.2%)	7(37%)	27(54.0%)	
COPD				
Positive	16(17.7%)	11(48%)	5(10.0%)	1.000
Negative	57(82.3%)	12(52%0	45(90.0%)	
Bronchial Asthmatic				
Positive	6(1.6%)	4(17.3 %)	2(4.0%)	1.000
Negative	67(98.4%)	19(82.7%)	48(96.0%)	
CKD				
Positive	25(30.6%)	9(39.1%)	16(32.0%)	1.000
Negative	48(69.4%)	14(70.9%)	34(68.0%)	
Hepatic impairment				
Positive	10(6.5%)	7(30.4%)	3(6.0%)	0.166
Negative	63(93.5%)	16(69.6%)	47(94.0%)	
CHF				
Positive	16(16.1%)	4(17.3%)	12(24.0%)	0.670
Negative	57(83.9%)	19(82.7%)	38(76.0%)	
Hypertension				
Positive	24(29.0%)	6(26%)	18(36.0%)	0.481
Negative	49(71.0%)	17(74%)	32(64.0%)	
IHD				
Positive	15(16.1%)	3(13%)	9(18.0%)	0.670
Negative	57(83.9%)	20(87%)	41(82.0%)	
Cancer				
Positive	9(4.8%)	5(21.7%)	4(8.0%)	0.482
Negative	64(95.2%)	18(78.3%)	46(92.0%)	
Smoking				
Positive	25(30.6%)	11(47.7%)	14(28.0%)	0.487
Negative	48(69.4%)	12(52.3%)	36(72.0%)	

4. Discussion

The current study shed a spot of light on one of important symptoms of COVID-19, which is Anosmia, it feature (when started, it's. Course during the disease, expected time of resolve). In our study cough, fever, fatigue and myalgia are the most common symptoms in COVID-19 group. Fatigue and myalgia were present in 55 % of cases. Anosmia and dysgeusia were noticed in about half of cases. These two symptoms represent a major clinical features of COVID-19.

73 (47%) of our 300 COVID-19 patients reported anosmia. [8] reported anosmia in 86% (n = 357/417) of their patients, [9] reported 54 %, [10] reported 51 %, [11] reported 25 %, [12] reported 47 %.

The present study revealed that 70% of cases of anosmia associated with dysgeusia, while [12] reported 85%.

In our study patients with anosmia were younger, with a higher percentage in women, less disability at baseline, and with fewer comorbidities. hospitalized patients with anosmia have a better prognosis, in terms severity of the disease only in mild and moderate cases not in severe cases. No significant differences were found between the two groups about temperature, heart rate and respiratory rate. No significant differences between patients with anosmia and those without anosmia as regard most of symptoms, other clinical signs. 70% of patients with anosmia were associated with dysgeusia. 50 % of patients with anosmia recovered within 13 days, 85 % within 22 days Regarding timing of onset, anosmia appeared (before, at same time and after) of the other COVID symptoms (10 %, 65% and 25%) respectively. No significant relationship between progress of anosmia and total leucocytic count level, absolute lymphocytic count, platelets number, hemoglobin level, creatinine, urea level, liver functions, total albumin. There is significant relationship (parallel relationship) between and progress of anosmia and level of D- dimer, CRP, serum ferritin. It means that anosmia prognosis is highly related to inflammatory process of COVID pathophysiology. There is a positive relationship between anosmia prognosis and oxygen saturation, and CT changes, it means that anosmia is a good prognostic value.

Limitations

One of our study limitations was the limited number of patients with Anosmia.

5. Conclusion

Anosmia is one of the principal features of COVID-19 with a high prevalence, and underlying diseases of patients may also influence its occurrence and development. The possible pathogenesis of COVID-19-induced anosmia is complicated and may involve inflammation of the olfactory area and damage to the Olfactory bulb or olfactory center in the frontal lobe of the brain by SARS-CoV-2. Most patients with COVID-19-induced anosmia can regain their sense of smell.

While further research is still required, we believe the current study and the rapidly evolving evidence base supports an urgent need to add anosmia to the list of symptoms used in screening tools for possible COVID19 infection and rapid treatment of these cases.

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