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Short Communication

Anosmia as presenting symptom in COVID-19 patients

Mumen Abdalazim Dafallah[1]*, Esraa Ahmed Ragab[1], Salma A. Ragab[2]

[1]Faculty of Medicine, University of Gezira, Sudan
[2]Faculty of Medicine, Alzaiem Alazhari University, Sudan

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***Correspondence:**
Dr. Mumen Abdalazim Dafallah,
E-mail: mumenabdalazim36@gmail.com

ABSTRACT

Corona virus disease 2019 is characterized predominantly by lower respiratory tract involvement, but also caused extra pulmonary manifestations. Recently, anosmia emerged as an important symptom in this pandemic. The report clarifies the importance of this issue. The data was searched in pub Med, Medline and Google scholar. A total of 227 articles were initially identified, however 36 important articles were chosen for full reading. Anosmia observed to appear in the early course of the disease and could be the initial and/or the only presenting symptom. It occurred more commonly among female and young age patients, and associated significantly with dysgeusia. The study showed that recovery from anosmia is likely in the majority of cases. We conclude that anosmia proved to be an important symptom in COVID-19 and used as tool for screening.

Keywords: Anosmia, COVID-19, Coronavirus

INTRODUCTION

An outbreak of coronavirus disease 2019 (COVID-19), caused by a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was detected firstly in Wuhan city, Hubei province, China on December 2019. In the next month the disease spread rapidly to other 18 countries and the world health organization (WHO) announced it as global health pandemic.[1] COVID-19 has demonstrated a wide spectrum of clinical manifestations, from asymptomatic or pauci symptomatic forms, to severe viral pneumonia with respiratory failure, multi-organ and systemic dysfunctions.[2,3] Fever, dry cough, dyspnoea, myalgia and fatigue were the commonest symptoms at the onset of the disease.[4] Although the virus prefers to affect the respiratory and cardiovascular systems, however, severe patients with COVID-19 may develop neurological symptoms (such as headache, dizziness, hypogeusia and neuralgia).[5,6,7] Olfactory dysfunctions (anosmia/hyposmia) are the commonest peripheral nervous system symptoms.

METHODS

Current study was conducted as short communication report. The authors searched on the literature using the following databases; pub Med, Medline and Google scholar. These databases were searched using the keywords; COVID-19, SARS-COV-2, anosmia and loss of smell. The authors searched also using combination of the following terms; COVID-19 and anosmia or COVID-19 and loss of smell or SARS-COV-2 and anosmia or SARS-COV-2 and loss of smell. The search was conducted looking for articles published in English language, the articles and the abstracts were then screened. Articles were scanned and read; further relevant

references in the reference lists were also included. A total of 227 articles were initially identified, however 36 articles were chosen for full reading. The articles then analyzed and data were extracted.

RESULTS

Many viruses including corona viruses are well known to cause loss of smell.[8,9] Despite this fact, the initial studies from China didn't report anosmia or hyposomia as a common symptom in patients with COVID-19.[9-12] In March 2020, doctors in Tehran, Iran, noticed that there were a lot of patients who came to the clinic complaining of complete smell loss, they followed 8 patients over 2 weeks period, five patients were tested and their results came positive for COVID-19.[9] A lot of researches then done to illustrate the relationship between loss of smell and COVID-19.

A study conducted in European COVID-19 patients showed that 85.6% reported olfactory dysfunction.[12] Passali and Bentivoglio from Italy commented on the previous study (olfactory and gustatory dysfunctions as a clinical presentation of mild-to-moderate forms of the coronavirus disease (COVID-19): a multicenter European study) saying that the virus affect the olfactory nerve and this is well known, as around 10-15% of COVID-19 Chinese hospitalized patients presented olfactive and/or gustative disorder.[13] They also reported that 25-30% of patients of COVID-19 inpatient ward in their university hospital developed olfactory dysfunction, this results are close to the data in the study done by Giacomelli et al.[14,15]

In Switzerland the prevalence of olfactory dysfunction was 61.2%.[15] Control study from Germany showed that 40% of COVID-19 patients were diagnosed with anosmia.[16] Another study from Germany reported that anosmia has been found in upwards of 2/3 of patients infected with COVID-19.[11] The same study suggested that anosmia has been the primary presenting symptom in 30% of COVID-19 positive patients in South Korea.[12] A study from Korea showed that 26.1% of patients with COVID-19 presented with anosmia.[17]

Anosmia in COVID-19 patients was found to be more common in females than males.[15] In relation to age, studies documented that anosmia was common in young patients and correlate negatively with older age.[15]

Anosmia may be the first apparent symptom of COVID-19.[11,18] Some patients experienced anosmia on the first day and overall occurred at median infection day 3 and others presented anosmia with median duration of 7 days.[16,18,21] One study showed that COVID-19 patients reported anosmia before the hospital admission more than during the hospital stay. Other study revealed that anosmia generally occurred two days after presence of the fever. [20]

Regarding pathophysiology, the last studies showed that infected COVID-19 patients have high levels of angiotensin converting enzyme 2 in the nasal epithelium so, letting the virus to enter.[18,21] Destruction of the olfactory epithelium was the main pathophysiological mechanism by which SARS-CoV-2 cause olfactory dysfunction; this mechanism was similar to pathophysiology of post viral olfactory dysfunction (PVOD).[22] Anosmia has never been reported as common symptom in SARS-COV despite it resembles SARS-CoV-2 in numerous features like pathogenesis, sequence and cellular entry.[21]

COVID-19 could manifest as an isolated sudden hyposmia/anosmia or accompanied by dysgeusia.[23,24] Both olfactory and gustatory dysfunctions are significant symptoms in COVID-19, which confirmed by study conducted in several European countries and it was similar to finding in other different studies.[20,25] A study conducted in Italy showed that 33.9% of COVID-19 patients had at least one taste or olfactory disorder and 18.6% had both.

There was a significant association between olfactory and gustatory dysfunctions in patients with COVID-19 ($p<0.001$) and their severity were strongly correlated ($p<0.001$).[13,16]

DISCUSSION

Studies noted that in patients with COVID-19, anosmia and ageusia are not associated with nasal obstruction or other rhinitis symptoms as in usual other respiratory viral infections, so during this pandemic the presence of anosmia and dysgeusia without other respiratory diseases such as acute rhino sinusitis, chronic rhino sinusitis or allergic rhinitis; should alarm doctors to the possibility of COVID-19 infection and prompt serious actions of self-isolation and test confirmation of suspected cases.[26-29]

Patients with olfactory disorder may experience more severe shortness of breath.[15] Patients who experienced changes in smell and taste for more than 10 days have higher risk of developing severe pulmonary symptoms and signs (2.4 times greater).[20]

Regarding the diagnosis, anosmia may be self-reported or tested by use of the Sniffin Stick's test.[16] Self-reported olfactory impairment now considered as a hallmark of COVID-19.[29] The presence of self-reported olfactory or taste dysfunction had high specificity as a screening criterion for COVID-19 in Asian cohort study but lower sensitivity. On the other hand, the Sniffin Stick's test had been used for full assessment of the olfactory function in COVID-19 patients.[16] This test was more sensitive in detecting anosmia in comparison to self-reporting olfactory dysfunction.[16]

Anosmia has high early recovery rate (80%), more investigations needed to be done regard long term

recovery rate.[30,31] The same study concluded that, for patients who developed anosmia; recovery occurred in the majority of cases. Due to lack of studies in anosmia recovery rate, duration and guidelines treatment, further efforts are needed to address this issue.

CONCLUSION

Like other viruses that causes severe acute respiratory syndrome, coronavirus too can cause loss of smell. At first it was not reported as common symptom; later on anosmia was considered being an important symptom and alerts the doctors to the possibility of COVID-19 infection. We conclude that identification of olfactory dysfunction is of particular importance to suspect and diagnosed COVID-19.

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