Anosmia and dysgeusia associated with COVID-19 infection among patients visiting a tertiary hospital at Kaski, Nepal

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ABSTRACT

Introduction: A number of studies have shown that anosmia and dysgeusia present as symptoms of COVID-19. These symptoms can appear with sudden onset following COVID-19 infection. The objective of the study was to observe epidemiological and clinical profile of COVID-19 patients who had experienced anosmia and dysgeusia. **Methods:** A cross-sectional study was carried out in Ear, Nose and Throat outpatient department of Pokhara Academy of Health Sciences over a period of two months, from February 2022 to March 2022. Patients visiting the outpatient department were enquired about the COVID-19 infection status in the past and symptoms related to taste and smell impairment were asked about. **Results:** Out of total 198 patients, 141(71%) had experienced impairment of taste and smell, either one or both, while the rest did not develop such features after testing positive for COVID-19 virus. **Conclusions:** Anosmia and dysgeusia were common features in COVID-19 infection.

Keywords: Anosmia, COVID, dysgeusia, post-viral inflammation.

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INTRODUCTION

Coronavirus disease-2019 (COVID-19) initiated global changes in public health and socioeconomic conditions since 2020 A.D. It has threatened the whole world as a serious public health concern and still continues to cause outbreaks from time to time in various parts of the world.[1,2]

COVID-19 is an acute respiratory disease caused by SARS-CoV-2 virus from the corona family of viruses. The disease caused by this virus is called COVID-19.[3] The virus has been renamed from 2019-nCoV(Novel Coronavirus)to severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).[4,5] SARS-CoV-2 infections can range from asymptomatic cases to acute respiratory distress. COVID-19 was declared as a Public Health Emergency of International Concern (PHEIC) at the beginning of 2020 and a pandemic a few months later on March, 2020.[6]

Regarding patients presenting to the Ear, Nose, and Throat outpatient department (ENTOPD), the common symptoms following COVID infection were nasal discharge, headache, fever, cough, fatigue, malaise and sore throat. These symptoms could be the presenting features following upper respiratory tract infections caused by other viruses like adenovirus, rhinovirus, etc. Some atypical presentations observed in COVID infection were loss of smell (anosmia), deranged sense of smell (parosmia), loss of taste sensation (ageusia), and altered sense of taste (dysgeusia). Change in taste and smell sensation

can lead to a decreased appetite and apprehension. Anosmia is commonly associated with post-viral inflammation and chronic rhinosinusitis, which can occur not only after COVID infection but after other viral infections too.[7] Non-infective causes are nasal polyps, head trauma, tumors, radiotherapy etc.[8,9]

Different studies have shown anosmia and dysgeusia to be present as symptoms of COVID-19 in variable degrees.[10,11] Some reports have noted that post-viral anosmia is a common event (upto 40% of anosmia) and others have mentioned a rate of up to 30% in 2000 tested patients.[8] Post-viral olfactory dysfunction caused by neuroepithelial dysfunction is a common cause of reduced olfactory function.[10] Anosmia may recover after relief of nasal obstruction and inflammation, in addition to self-regeneration of olfactory neurons through stem cells in the olfactory neuroepithelium.[9]

This study aimed to find out the epidemiological and clinical profile of patients who developed anosmia and dysgeusia following COVID infection.

METHODS

A descriptive cross-sectional study was conducted at ENT OPD, Pokhara Academy of Health Sciences (PoAHS), Western Regional Hospital, Pokhara, Nepal. Patients visiting ENT OPD for any ear, nose, throat problems were enquired about COVID infection in the past. It was first confirmed (via history) that anosmia developed during or after COVID infection. The presence of anosmia in the past with other nasal symptoms was asked about, to rule out other nasal pathology leading to anosmia. ENT examination was done in OPD which ensured that the patient did not have other nasal pathologies. Those who were proven to have COVID infection following RT-PCR of nasopharyngeal swab were questioned regarding anosmia, dysgeusia and other points. The questionnaire was based on the Anosmia tool developed by the American Academy of Otolaryngology.[11] Questions were adapted and modified from the Anosmia tool[11] which included data regarding COVID infection test result, presence or absence of anosmia, whether anosmia resolved or persisted, time period of recovery of anosmia and whether anosmia resolved completely or partially. Each patient enrolled in the study was interviewed to fill up the questionnaire. Data collection was done over a period of two months' time, February 2022 to March 2022. Ethical clearance was obtained from the Institutional Review Committee, PoAHS before study was commenced (Reference number: 84/078). Consent was taken prior to enrollment of patients in the study. All patients who had history of proven COVID-19 infection (RT-PCR positive) were included in the study. Those patients who had symptoms of COVID-19 in the past but did not take RT-PCR were excluded from the research. The data collected were analyzed using MS Excel and presented in tables and percentages.

RESULTS

Total 198 patients were included in the study out of which 104(52%) were females. The age range of the patients ranged from 11 to 80 years of which majority 54(27%) belonged to age group 31 to 40 years (fourth decade) followed by 46(23%) patients in 21 to 30 years age group, 7(3%) in age group 11 to 20 years, 20% in age group 51 to 60 years, 12(6%) in group 61 to 70 years and 2(1%) in the age group above 70 years. Around 114(57%) patients suffered from both anosmia and dysgeusia and in 57(28%) cases, there was no disturbance in taste and smell sensation. (Table 1)

Table 1: Demographic profile of patients (N=198)

Parameters	n(%)
Mean age± SD	40.80 ± 13.37
Male	94(47%)
Female	104(52%)
Anosmia only	18(9%)
Dysgeusia only	9(4.5%)
Anosmia and dysgeusia both	114(57%)
Taste and smell not disturbed	57(28%)

Tables 2 shows the time period of recovery, as recalled by patients. Most of the patients recovered within two weeks, and others took up to a month. It can be noticed from the table that 67 % of patients recovered in two weeks to one month time. We found that six patients (4.2%) recovered after three months. One patient gave history of recovery in five months. All patients had complete recovery from anosmia and dysgeusia.

Table 2: Time period for recovery (n=141*)

Recovery	n(%)
Average time period for recovery	20.21 days± 22.63
Time period for recovery in range	2 days to 5 months
Cases that recovered in one week	33(23.40%)
Cases that recovered in two weeks	43(30.49%)
Recovery in 2 weeks to one month	20(14.18%)

*those who developed anosmia, dysgeusia or both

Out of total cases, 56 patients were found to have co-morbidites. Regarding co-morbidities, 24(12.12%) patients had history of hypertension, 12(6.06%) had diabetes, 4

(2.02%) had COPD, 4 (2.02 %) had CKD, one case (0.5%) had hypothyroidism, while 11(5.55%) patients had hypertension and diabetes both.

DISCUSSION

There are many signs and symptoms in COVID-19 infection, among which two are anosmia and dysgeusia. Though self-limiting, these symptoms might be very distressing to the patients. Sometimes it may take a long period for the normal function of smell and taste to return. Loss of smell and taste sensation can lead to decreased appetite leading to prolonged morbidity.

Potential hypothesis of olfactory dysfunction is direct extension through the nasal mucosa and extension to the olfactory bulb.[10,11] Han et al.[12] have discussed that mechanism of anosmia in COVID infections can only be speculated at present, because of paucity of published data in this topic. Bilinska et al.[13] have highlighted the need for new systematic studies using infectious virus and animal models to get unequivocal answers in this area.

Various researches and literatures have shown that olfactory and gustatory dysfunctions represent common clinical findings in COVID-19 infected patients. ENT specialists and clinicians need to be aware of this diagnostic option when evaluating cases of sudden onset of ageusia and non-specific anosmia that are not associated with rhinitis symptoms.[14] In COVID-19 infection, ageusia and anosmia may not be necessarily accompanied by nasal obstruction or other features of rhinitis like purulent nasal discharge. Authors have suggested that this is probably due to the direct damage done by the virus on the olfactory and gustatory receptors.[14,15]

Hornuss et al.[16] have discussed in their publication that 49% of people studied had anosmia in their cohort study. Another study reported that 47% (54 out of 114 patients) were confirmed to have anosmia. Mean age of the 54 patients was 47±16 years; 67% were females.[17] In our study, 57% of patients recalled having suffered from anosmia and dysgeusia both, while patients with anosmia only were just 9%, which is comparable to the findings shown by Klopfenstein et al. [17]

Han et al.[12] have reviewed a number of studies in their research regarding anosmia in COVID infection. They have quoted that different studies have shown the incidence of anosmia in COVID infection to be in the range of 20 to 85% of patients and about 72% of patients with olfactory dysfunction recovered within the first eight days of morbidity.[12] This figure suggests that olfactory abnormalities in COVID infection have a temporary pathophysiology. In contrast to this, the present study revealed that 30.49% of patients recovered from anosmia in two weeks time, while the proportion of patients that recovered in one week was 23.40%.

Mao et al.[18] published a multi-centric research based in Wuhan, China. They have divided neurologic manifestations into three categories: central nervous system manifestations, peripheral nervous system manifestations (taste, smell and vision impairment), and skeletal muscular injury manifestations. The authors concluded that the most common neurological features were hyposmia (5.1%) and hypogeusia (5.6%) among 214 patients selected for study.[18]

The study consists of a small population of patients studied in a small period of time.We also figured that due to recall bias, some patients may have been confused regarding the duration of symptoms. The data includes co-morbidities of the total cases i.e, 198 patients. It would have been more meaningful if co-morbidities in affected individuals only were taken, more importantly of those with prolonged morbidity of anosmia and dysgeusia.

CONCLUSIONS

Anosmia and dysgeusia were common features in COVID-19 infection. All age groups were affected and all patients in study group recovered over a period of time. Sudden loss of taste and smell sensation in absence of other nasal problems should lead to suspicion of COVID infection. Though the rate of COVID-19 infection in the public has significantly decreased to a bare minimum, it still threatens the country and the whole world of recurring outbreaks and so remains a public health concern.

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AUTHORS CONTRIBUTION

SS did works on concepts, design and definition of intellectual content, literature search, data acquisition, data analysis, statistical analysis, manuscript preparation, editing and review. AMB contributed in literature search, data analysis and manuscript review. UA contributed in literature search, statistical analysis and manuscript review. AS worked on data acquisition, manuscript preparation and review. BG worked on data acquisition, manuscript

editing and review. LB contributed in concepts of study, data acquisition and review.

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