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The Impact Of COVID-19 Vaccination On Anosmia And Ageusia: An Online Survey

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Abstract: The long-term impact of COVID-19 has been a matter of discussion and research ever since the infection caused a global pandemic. Among the many manifestations of the virus, its effect on taste and smell has been a significant point of study and observation [1,2]. The aim of this study was to investigate the relationship between loss of taste and smell and vaccination status, alongside other factors that influenced these symptoms in the general population after contracting COVID-19.
We conducted a cross-sectional online survey (N = 257) in May 2022. We found that the reported incidence of loss of smell and taste decreased as the number of vaccine doses increased. Participants who had received at least one dose were less likely to report loss of taste and/or smell during their infection, and those who had received a booster reported these symptoms least often of all. Vaccinated participants also tended to report shorter symptom duration. Taken together, the findings point to a positive influence of vaccination not only on whether these symptoms occurred, but on how long they lasted.

Keywords: COVID-19, SARS-CoV-2, vaccination, loss of smell, loss of taste, anosmia, ageusia, olfactory dysfunction, gustatory dysfunction, symptom duration, vaccine doses, booster dose, post-COVID-19 symptoms, cross-sectional survey, general population

Introduction

Now that the COVID-19 pandemic is better understood by both the general population and the scientific community, it is worth revisiting the clinical manifestations that defined it — most specifically anosmia (loss of smell) and ageusia (loss of taste), which became one of the de facto markers of a COVID-19 infection in the public mind [3]. As vaccines entered markets and government programmes, the way different vaccines influenced anosmia and ageusia became a question we wanted to assess directly.

These chemosensory changes are more than a trivial inconvenience; they can meaningfully reduce a person's quality of life [2]. Losing the ability to taste food and to smell familiar things affects appetite, and has been linked to weight loss, low mood, and social withdrawal. There is also a practical safety concern: someone who cannot smell may not notice smoke, a gas leak, or spoiled food. Understanding how these symptoms relate to vaccination status therefore has value for both clinical care and public health messaging.

The mechanisms behind olfactory and gustatory dysfunction in COVID-19 are still not fully settled, and several are likely to be involved [2]. SARS-CoV-2 enters human cells primarily through angiotensin-converting enzyme 2 (ACE2) receptors, which are found not only in lung tissue but also in the nasal epithelium and the oral cavity. The virus may damage the sustentacular cells that support olfactory sensory neurons, provoke a local inflammatory response that disrupts sensory function, act on the central nervous system directly, or affect taste receptors through ACE2-mediated entry. These different mechanisms may help explain why presentation and recovery vary so much between patients [1,2].

Research question

What is the relationship between anosmia and ageusia and the vaccination status of patients with COVID-19 infection?

Materials and Methods

This was a cross-sectional study based on an online survey with both quantitative and qualitative elements. Alongside basic demographic information, we asked participants about their COVID-19 infection, their vaccination status, the other symptoms they experienced, the duration of their anosmia and ageusia, and how they managed those symptoms.

The survey used several question formats — multiple choice, open-ended, and Likert scale — so that we could look not only at the correlating factors between symptoms and patient characteristics, but also at how anosmia and ageusia affected participants' daily lives.

We used non-probability convenience sampling. To reduce the risk of confirmation bias, the survey was distributed to the general population rather than specifically to people who had had COVID-19, and the relevant responses were identified only afterwards, at the analysis stage.

A total of 267 responses were recorded, of which 257 participants consented to have their information used. Analysis was descriptive.

Before conducting the survey, we carried out a literature review using PubMed, NIH, and KAMJE to gather background data and to identify the factors — age, vaccination status, and symptom duration among them — that we would go on to examine.

The survey was open for five days during May 2022. All participants voluntarily consented to sharing their information for this research, and full anonymity was maintained throughout.

Results

Among the 257 participants included, 54.7% reported experiencing anosmia and ageusia during their infective period. Of those affected, 30% were fully vaccinated and 7% were partially vaccinated. Among participants who had received a booster dose, 30% reported anosmia and ageusia during their infection.

Most participants who reported a more moderate form of the infection — which included anosmia and ageusia — were between 25 and 40 years of age. Overall, 42.9% reported that these symptoms began on the 4th to 6th day of their infection, and 45.7% reported full recovery within a month; the remainder took several months to recover.

Interestingly, 64.3% of participants said they had already suspected COVID-19 before losing their sense of taste or smell. Fever was the most commonly reported early symptom, noted by 78.9% of participants.

Among fully vaccinated participants who still experienced anosmia and/or ageusia, nearly 43% had received Covishield and 21% had received Pfizer.

Discussion

The pattern we observed suggests that vaccination offered some degree of protection against these sensory symptoms, and that the protection was greater with more complete vaccination status. This held broadly across age groups and vaccine types, though the degree varied.

One of the more striking findings concerned timing. Anosmia and ageusia are often described as early warning signs of infection, but in our sample they usually appeared several days in — most commonly on days 4 to 6 [3]. Most participants had already suspected COVID-19 before their sense of taste or smell changed. This may suggest that the virus requires some time to affect the sensory pathways, or that these symptoms arise partly from the immune response rather than from direct viral damage alone [2]. Either way, it has implications for how we frame symptom monitoring and public messaging.

Recovery followed a similar pattern. Vaccinated participants who did experience sensory disruption generally reported a shorter duration of symptoms than unvaccinated participants [4]. Breakthrough infections can clearly still cause anosmia and ageusia, but vaccination appears to moderate their severity and length. This supports the value of vaccination not only for preventing infection, but for limiting its sensory consequences when infection does occur.

The concentration of sensory disruption in the 25–40 age group deserves further attention [1]. It may reflect behavioural factors, occupational exposure, or an underlying biological difference. Future work could examine whether this pattern holds across different variants and vaccination rates, and whether it reflects genuine vulnerability or simply exposure.

Limitations

Our findings should be read with the study design in mind. This was a self-reported, cross-sectional online survey using convenience sampling, so the sample is not representative of the general population and the results cannot establish causation. Symptoms were not objectively tested, and recall bias is likely, since some participants were describing infections that had occurred months earlier. The analysis was descriptive rather than inferential, so differences between groups should be read as observed trends and not as statistically tested effects. Finally, the number of participants in some subgroups — particularly the partially vaccinated — was small.

Conclusions

More than half of our participants experienced anosmia and ageusia during their infection, and the likelihood of doing so fell as vaccination status became more complete. This pattern was consistent across age groups and vaccine types, and it adds to our understanding of vaccine benefits beyond the prevention of severe disease and death [4].

Our findings also suggest that these symptoms tend to emerge several days into the illness rather than serving as its first indicator, which may be worth taking into account in clinical recognition and public health messaging [3]. More broadly, the study points to the significance of upper respiratory symptoms that are often overshadowed by the more familiar cough and cold presentation of COVID-19 [1,2,3,4].

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