Psychophysical olfactory testing in COVID-19: is smell function really impaired in nearly all patients?

We read with special interest the recent article by Moein et al.[1] They reported an alarming 98% prevalence of olfactory loss in a study involving 60 confirmed coronavirus disease 2019 (COVID-19) patients and 60 control subjects in Iran, using a well-validated psychophysical smell test: the University of Pennsylvania Smell Identification Test (UPSIT). The study has had significant impact and has been cited in several articles on COVID-19. However, the nature of odor identification, closely related to familiar scents, usually limits the use of olfactory tests to the country or region where they have been developed and validated.

UPSIT is commonly used in America. Nevertheless, this test may not be adequate for the Iranian population. Indeed, in 2014, Kamrava et al[2] conducted a study to assess the accuracy of UPSIT in the Iranian population. Results in 60 healthy adult volunteers showed that only 16 of 40 odorants were correctly identified by 70% of the subjects, demonstrating that UPSIT is not a suitable test to assess smell function in the Iranian population due to the high number of unfamiliar items. Moreover, using the original UPSIT, all Iranian healthy volunteers would have been classified as having severe microsmia according to US normative values (severe microsmia: score of 19-25).

In light of these results, Taherkhani et al[3] developed a modified version of UPSIT for the Iranian population, the Iran Smell Identification Test (Iran-SIT), using only 24 of the 40 original odorants. This test has been validated with the minimum identification concentration of odorants[4] and, more recently, in 420 healthy Iranians from various ethnic groups and 150 patients with abnormal olfactory function.[5] Curiously, the mean odor identification score in healthy subjects was 21.41 ± 1.37, very similar to the 20.98 mean UPSIT score obtained by Moein et al[1] in COVID-19 patients.

On the basis of the aforementioned evidence, we believe that the 98% smell dysfunction prevalence in COVID-19 Iranian patients reported by Moein et al probably does not reflect reality, because they used a smell test designed for the American population that has proved to be culturally inadequate for the Persian population. In addition, the authors do not specify inclusion and exclusion criteria for the patients from the control group, who were taken from an earlier study database. Also, as the control group consisted of healthy subjects rather than severe acute respiratory syndrome–coronavirus-2 (SARS-CoV-2) polymerase chain reaction–negative patients but with similar symptoms, the frequency of loss of smell could also be due to viral (common cold) or postviral infection.

We believe that Moein et al should reanalyze their data, using only the odorants of UPSIT valid for the Iranian population to portray a more realistic clinical picture about the prevalence of smell dysfunction in COVID-19 patients.

The public should definitely be informed that smell impairment is frequent in viral infections, and can often be presented as an early symptom in COVID-19. However, patients and physicians at healthcare systems should not assume that a normal UPSIT score when exploring olfaction means a low probability of having a SARS-CoV-2 infection.

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References

1. Moein ST, Hashemian SMR, Mansourafshar B, et al. Smell Dysfunction: A Biomarker for COVID-19. *International forum of allergy & rhinology*. 2020;10:944-950.
2. Kamrava SK, Farhadi M, Jalessi M, et al. University of Pennsylvania smell identification on Iranian population. *Iran Red Crescent Med J*. 2014;16:e7926.
3. Taherkhani S, Moztarzadeh F, Seraj JM, et al. Iran Smell Identification Test (Iran-SIT): a modified version of the University of Pennsylvania Smell Identification Test (UPSIT) for Iranian population. *Chemosens Percept*. 2015;8:183-191.
4. Kamrava SK, Jalessi M, Ebrahimnejad S, et al. Evaluation of culturally-familiar odorants for a persian smell identification test. *Iran J Otorhinolaryngol*. 2018;30:19-25.
5. Kamrava SK, Jalessi M, Ghalehbaghi S, et al. Validity and reliability of Persian Smell Identification Test. *Iran J Otorhinolaryngol*. 2020;32:65-71.