Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Olfactory and gustatory dysfunctions are difficult to evaluate in hospitalized COVID-19 patients

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Dear Editor,

We read the retrospective study of Husain et al. entitled "*Characteristics of COVID-19 smell and taste dysfunction in hospitalized patients* [1]." Authors extracted data from patients who were admitted into the hospital for moderate-to-severe COVID-19 in order to investigate the prevalence of olfactory (OD) and gustatory dysfunction (GD). According to the medical record findings, they reported that 4% of COVID-19 hospitalized patients experienced smell or taste dysfunction. They based the identification of smell or taste dysfunction on the medical record (anamnesis), and they did not use validated patient-reported outcome questionnaires or psychophysical evaluations. The study is important because the high majority of previous investigations focused on ambulatory-managed patients and, to date, only a few papers reported OD or GD prevalence in hospitalized patients. However, many methodological points have to be addressed.

First, authors did not provide the time between the admission and the evaluation of the prevalence of both OD and GD. Moreover, there was no data about the proportion of patients hospitalized in intensive care units. In practice, many patients with severe or critical COVID-19 require endotracheal intubation for several days (weeks), which may delay the smell and taste evaluation [2]. The delay between the admission and the time of smell and taste evaluation is an important outcome for the result interpretation because 44.0% of COVID-19 patients reported early recovery of smell [3], which may occur during the period where the patient is intubated and unconscious. In the same way, OD occurs after the other symptoms in 65.4% of cases [3], corresponding to a period where some hospitalized patients with severe COVID-19 may be intubated and unconscious. Moreover, OD lasts less than 8 days in 54.8% of cases [3,4]. Thus, it seems conceivable that severe and critical patients who were interrogated after the intensive care unit stay did not report smell or taste disorders, biasing the evaluation of the prevalence of OD and GD in a proportion of hospitalized patients.

Second, authors did not report therapeutic findings of patients. Corticosteroids are used to manage patients with severe acute respiratory syndrome related to COVID-19 [5]. Corticosteroids may be also used to accelerate the smell recovery in anosmic and hyposmic COVID-19 patients [6,7]. In that context, the patient treatment may be an important factor to consider in case of post-therapeutic/hospitalization evaluation of the prevalence of OD and GD.

Third, the detection of OD and GD has to involve as far as possible psychophysical evaluations because patients with non-COVID-19 severe respiratory disorder may feel that they have smell disorder, which is more related to the respiratory disorder and not to an olfactory neuroepithelium impairment [8]. Finally, as authors used a retrospective study, their results might be limited by the fact that the examiner have or have not asked the patient for this symptom, which is a serious observational bias. Furthermore, it is known that patients tend to overestimate their sense of smell, and not being conscious of their disability [9]. In fact, in COVID-19 patients, it has been found that 57.89% of patients reporting normal sense of smell had olfactory loss, and 13.16% had severe olfactory loss [10].

Although it is probable that the prevalence of OD and GD of patients with moderate-to-critical is lower than the prevalence of the related dysfunctions in mild patients, findings of studies using self-reported questionnaire/anamnesis are still limited due to delay of evaluations and patient hospitalization features (intubation, etc.).

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