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## Reply to the Letter to the Editor: “Smell of migraine: Osmophobia as a clinical diagnostic marker”

Dear Sir,

We are grateful to Mainardi et al. for their interest in our article. The authors have examined the relationship between odors and headaches and they confirm that osmophobia is common in migraine patients, despite not being a diagnostic criterion. For the past 15 years, we have been dedicated to the study of the association between odor and headaches. In a previous study, we compared 200 patients with migraine and 200 with tension-type headache, and during headache attacks osmophobia was reported by 86% of patients with migraine and only 8.0% of those with tension-type headache. In this study, osmophobia had higher specificity in the diagnosis of migraine than photophobia or phonophobia (1). In another comparative study involving patients with migraine and tension-type headache who were exposed to odors, we found a 70.0% appearance of headache exclusively in patients with migraine (2).

In the last 30 years, there have been many studies on the occurrence of osmophobia in primary headaches. In a global review we are conducting on the study of osmophobia, we find that the first and only study to investigate the relationship of odors with different forms of primary headaches was published in 2005 (3). In this study, osmophobia was present during the headache attacks in 42.3% of migraine patients and 6.8% of those with cluster headache, but was absent in all patients with tension-type headache and other primary headaches.

Even though there have been many previous studies, there is still no clinical marker for the diagnosis of migraine yet. Odor as a trigger of headache may be a marker and a specific test to be used in patients with headache. In our recent research, we have used a perfume as a test to trigger headache. This test was positive only in migraine patients (4).

We agree with Mainardi et al. that osmophobia be included in the next revision of the classification of headaches as a diagnostic criterion for migraine. However, because the specificity of osmophobia is greater than photophobia and phonophobia, we suggest that the isolated presence of osmophobia during headache attacks should be considered a diagnostic criterion. Thus criterion “D” would be as follows: “During headache at least one of the following: (a) nausea and/or vomiting; (b) photophobia and phonophobia; and (c) osmophobia. We also suggest the inclusion of a new item: “Headache is triggered by odors.”

### Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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