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Letter to the Editor: Frequency of Visual Aura in Non-Migraine Headache Strongly Depends on the Underlying Pathophysiology

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▸ See the article "Visual Aura in Non-Migraine Headaches: A Population Study" in volume 38, number 31, e237.

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To the Editor:

We read with interest the article by Kim et al.[1] on a population-based study of 1,431 patients with non-migraine headaches and 507 patients with migraines for the presence of visual aura. Headaches were diagnosed using an internet-based headache diagnosis questionnaire.[1] A visual aura was reported in 26% of patients with migraine compared to only 14.5% of non-migraine headaches.[1] Among those with non-migraine headaches, those with visual aura reported more headache days and higher headache-related disability than those without aura.[1] The study is excellent but has limitations that should be discussed.

The main limitation of the study is that headaches were diagnosed over the internet and not in person.[1] Patients with headaches require a detailed individual and family history as well as a thorough clinical neurological examination. In order to distinguish primary from secondary headache types, it is imperative that all patients with headaches undergo cerebral imaging and angiography of cerebral arteries and veins. Because presence or absence of a visual aura and the underlying pathophysiology can be highly dependent on the non-migraine headache subtype, it is important to know how many of the non-migraine headache sufferers have infectious, inflammatory, vascular, traumatic, neoplastic, or structural causes.[2]

A second limitation of the study is that the current medications that the included patients were regularly taking were not considered to be a causative or contributory factor in the visual aura or headache. There are several illicit drugs that can be complicated by visual hallucinations, such as amphetamines, cocaine, LSD, or ecstasy. There are also numerous drugs that can cause visual phenomena as side effects, such as cephalosporines, steroids, beta-blockers, gabapentin, barbituric acid, ethosuximide, and several others.[3]

A third limitation of the study is that only the visual aura was examined. Several other types of auras have been reported in migraine and non-migraine headache sufferers. The most common of these are sensory (e.g. tactile disturbances) and aphasic aura. There is also an aura that manifests as muscle weakness, brainstem symptoms (brainstem aura), or retinal manifestations (retinal migraine).[4]

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A fourth limitation of the study is that the sensitivity of the VARS headache score, used to assess presence or absence of visual aura, is only 78.4%.[1] Therefore, recognition of the correct diagnosis was limited and 22% of patients diagnosed with visual aura may actually have none.

A fifth limitation is that different types of headaches can occur at the same time. How did the authors rule out that the included patients had different types of headaches, or developed a new type of headache during the observational period?

Although aura is most commonly associated with migraine,[1] aura is also a common manifestation of epilepsy, often precedes motor symptoms and is a warning sign for the affected individual. Aura often allows the patient to avoid serious complications (e.g. falls) during the unconscious phase of the ictus. In epilepsy patients, an aura can also occur without consecutive convulsions. Therefore, we should know how many of the included patients suffered from epilepsy in addition to headaches. Knowing the number of epileptic patients is not only important because seizures may be preceded by headaches or, more commonly, postictal headaches may follow seizures, but also because of the possibility that a headache itself represents a seizure.[5] Secondary headaches, in particular, can be complicated by seizures and seizures can begin with an aura. It is therefore important that epilepsy was ruled out as the cause of the aura in all included patients. How many of the included patients had epilepsy and how many were regularly taking anti-seizure drugs?

Overall, the interesting study has limitations that put the results and their interpretation into perspective. Addressing these issues would strengthen the conclusions and could improve the status of the study.

Authors' Response to the Letter

We would like to express our gratitude to Dr. Finsterer who has shown interest in our paper and provided valuable active feedback.[1] After careful consideration, we have organized our thoughts and would like to provide our summarized opinions on this matter.

Regarding the diagnostic process of headache disorders, I strongly agree that the gold standard for diagnosis is through a clinical interview conducted by a neurologist using established diagnostic criteria. Furthermore, we are also aware that in order to exclude associated secondary headaches, medication or additional tests may be necessary in some cases. However, the utility of web-based surveys in epidemiological research in the field of headache medicine has been increasingly demonstrated in recent studies and are cost-effective, convenient, and can reduce missing data.[6] In addition, the questionnaire used in our study had high sensitivity and specificity in the diagnosis of migraine and tension-type headache, which are highly prevalent headache disorders in the general population.[7] Additionally, the frequency of secondary headaches attributed to infection, inflammatory, vascular, traumatic, neoplastic, etc. is very low.[8,9] Nevertheless, we have already described the diagnostic process of headache disorders as a limitation of our study.

Regarding the use of medications that elicit visual hallucinations, the use of narcotic drugs is extremely low in Korea and is thought to be very unlikely in terms of usage.[10] Although we did not evaluate all the medications that cause visual symptoms, the frequency of these medications is very low.[11]

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For evaluating only the visual aura, headache-associated auras are accompanied by visual auras in 98% of cases, so identifying visual auras can identify the majority of auras in headaches.[12] Therefore, the only type of aura that has been established as a metric in epidemiologic studies is visual aura.[13,14] Hence, this study focuses specifically on the visual aura, and we have emphasized this in the title by focusing on the visual aura.

For an assessment of visual aura, we used the self-administered Visual Aura Rating Scale (VARS) questionnaire with 96.4% sensitivity instead of VARS.[15,16] This suggests that most of the visual auras were identified in our study.

As for the case of multiple headaches occurring simultaneously, there is no case where multiple types of headaches are diagnosed within a single headache event in the third edition of the International Classification of Headache Disorders (ICHD-3). Instead, ICHD-3 states that each distinct type, subtype, or subform of headache that the patient has must be separately diagnosed and coded.[9]

Migraine and epilepsy share some aspects of their pathophysiology, and significant comorbidity has been reported between the two conditions.[17] In this context, the possibility of misdiagnosing the aura in epilepsy as aura in headache can be considered. However, this seems unlikely, as a gradual onset over 5 minutes, a feature that is 100% discriminative of epileptic aura, was observed in 87% of the visual symptoms.[18] A gradual onset over 5 minutes is included as an item in the self-administered VARS questionnaire.[15,18] Additionally, the prevalence of epilepsy in South Korea is 0.7%, so the likelihood of mistaking an epileptic event for a migraine is very low.[19]

The abovementioned points regarding the diagnostic accuracy of headache disorders, the assessment of visual aura, and the use of medications could be limitations of our study; however, despite these limitations, we believe we have successfully assessed the prevalence and impact of visual aura in non-migraine headaches. Such limitations are common in epidemiologic studies of headache disorders. Nonetheless, epidemiologic studies of headache have been widely used in the study of headache disorders because of their ability to reduce sampling bias and provide an adequate representation of the status of headache disorders in the population at large.

Thanks to Dr. Finsterer's input, we believe that our paper can become more cohesive in its contents, and we will take these considerations into account and incorporate them into our upcoming research.

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