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Transient focal neurological symptoms and headache: is it TIA or migraine with aura?

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On the occasion of the 25th anniversary of J Headache Pain, it is worth again to discuss headache in transient ischemic attacks (TIA), because our 6-year-old article was downloaded 2.44 million times [1]. The paper showed an enormous interest in TIA and its differential diagnosis, a topic that we have addressed in several other articles before and after the landmark publication in 2018 [1].

Migraine with aura is the most frequent mimic of TIA [2, 3]. Our study showed that TIA was accompanied by a headache in 20% of cases making the differential diagnosis versus migraine with aura even more difficult [1]. Prospective testing of the International Classification of Headache Disorders (ICHD) 3 beta appendix- and main body diagnostic criteria for migraine with aura and migraine with typical aura in patients with TIA showed the highest sensitivity and specificity of the appendix criteria which therefore were included in ICHD-3 [4]. Proposed explicit diagnostic criteria for TIA also showed high sensitivity and specificity [5]. According to these criteria, a patient should have sudden onset (in 1 min or less) and no gradual spread of fully reversible (≤ 24 h) negative focal neurological or retinal symptoms. The symptoms should occur simultaneously and not be followed by a headache within one hour. These criteria are opposite to the diagnostic criteria for migraine with aura.

How should TIA be distinguished from MA in the emergency room in case of transient focal neurological symptoms and headache? It is necessary to take a detailed history of the development of all symptoms at the onset of any transient focal neurological symptoms. Do they include headaches and do they appear for the first time? If similar focal neurological symptoms were present in the past, this is a recurrent episode of TIA or migraine with aura and if two or more attacks fulfil a set of diagnostic criteria for migraine with aura [6], the diagnosis is certain. If it is the first episode, the explicit diagnostic criteria for TIA are valid for a diagnosis but need additional imaging (preferably MRI with DWI) [5].

In deciding about a headache with transient focal neurological symptoms, the following algorithm can be used. If a headache develops for the first time (a new type of headache) at the onset of transient focal neurological deficit, it is a secondary headache attributed to TIA [7, 8]. If it is a known kind of headache, we need to know about previous headaches, their type and clinical characteristics. If there are no changes in clinical characteristics of headache, it is a previous type of headache without changes of characteristics, not attributed to TIA. If it is a previously encountered kind of headache (migraine or

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tension-type headache or cluster headache or other) but with altered clinical characteristics, it is a migraine-like or tension-type-like headache in TIA and it is a secondary headache [7, 8]. Such headaches usually appeared within 1 h after the onset of TIA and were migraine-like in most cases [8]. This can result in a wrong diagnosis of MA. However, clinical characteristics of transient focal neurological symptoms and their development are different in MA and TIA as emphasized in the explicit diagnostic criteria for TIA [5]. Therefore, it is necessary to use these criteria in the differential diagnosis of TIA.

Sentinel headache is another interesting aspect of the study of headaches in TIA. This headache usually develops 24 h before TIA or less [1]. A novel headache in middle-aged to elderly persons can herald (be a sentinel to) ischemic cerebrovascular events. Further studies confirmed the presence of sentinel headache during 7 days before ischemic stroke [9]. Sentinel headache was a new type of headache or headache with altered characteristics and usually was a migraine-like headache with features of migraine without aura but not migraine with aura [1, 9].

All these findings allowed us to elaborate highly sensitive and specific diagnostic criteria for headaches attributed to TIA and ischemic stroke and to create diagnostic criteria for sentinel headache before ischemic stroke [8, 10].

In conclusion, clinical characteristics of headache and other neurological symptoms are key in the correct distinction between TIA and MA as well as between primary and secondary headache disorders in general. It is necessary to take published explicit diagnostic criteria for MA and TIA into account to make a correct diagnosis which is vitally important for patient management.

Abbreviations

ICHD-3	International Classification of Headache Disorders
TIA	transient ischemic attack

Authors' contributions

ERL wrote the manuscript. JO corrected the manuscript. All authors read and approved the manuscript.

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Data availability

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval

The Medical Ethics Committee of the Urals State Medical University approved all relevant studies.

Consent for publication

N/A.

Competing interests

The authors declare that they have no competing interest.

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