

Editors' Note: In reference to the study by Giles et al. of the prognostic value of ABCD2 scores in TIA patients, Drs. Rooij et al. propose that differences in duration from TIA to imaging may have influenced the study's results and suggest that the authors further stratify the data by time from TIA to diffusion-weighted imaging (DWI). Dr. Goldenholz et al. ask for the filter settings used by authors Andrade-Valenca et al. in their recent study looking at the value of scalp EEG recordings in locating the seizure onset zone. They also indicate that the presence of intracranial data would help better understand the scalp results. The authors specify their filter settings and discuss the utility of trying to correlate scalp and intracerebral EEG recordings, given the small brain volume picked up by the latter. Dr. Benbadis responds to the study by Dr. Salinsky et al. of psychogenic nonepileptic seizures in veterans by reinforcing the need for timely video-EEG monitoring in this population. Dr. Scharre, in his editorial on shunting in normal pressure hydrocephalus (NPH), gave "[naming] less than 13 animals in 1 minute" as an example of low verbal fluency. Drs. Khaku and Heilman point out that this is an example of category fluency, a particular subset of verbal fluency, and suggest that letter fluency may be a more specific screening tool for NPH.

Megan Alcauskas, MD, and Robert C. Griggs, MD

EARLY STROKE RISK AND ABCD2 SCORE PERFORMANCE IN TISSUE- VS TIME-DEFINED TIA: A MULTICENTER STUDY

Frank G. van Rooij, Frank-Erik de Leeuw, Ewoud J. van Dijk, Nijmegen, the Netherlands: Giles and colleagues¹ showed the prognostic value of the ABCD2 score in TIA patients stratified by the presence of a DWI lesion. However, we feel that differences in delay from TIA to imaging could have influenced the observed prognostic profiles of patients with and without DWI lesions.

The authors used data from 9 individual studies that included TIA patients who underwent DWI.¹ Although not all data could be derived from the source articles, apparently the delay from TIA to

DWI extended up to 2 weeks in one of the studies.² Differences in this delay between patients with and without DWI lesions were not provided.

A longer latency between TIA and DWI could affect the incidence of DWI lesions with a lower likelihood of finding DWI lesions when imaging was performed >24 hours after TIA. Others have described this before,³ as well as a lower DWI lesion rate in patients scanned in the subacute phase.⁴ Furthermore, occurrence of stroke before DWI excluded patients from the analysis, something expected especially in DWI-positive patients, given their worse prognosis.¹ This may also alter the prognostic value of DWI in this population.

We think that providing data additionally stratified by delay from TIA to DWI would be informative given that a large proportion of TIA patients receives their imaging >24 hours after symptom onset.

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INTERICTAL SCALP FAST OSCILLATIONS AS A MARKER OF THE SEIZURE ONSET ZONE

Daniel M. Goldenholz, Masud Seyal, Lisa M. Bateman, Sacramento, CA: Andrade-Valenca et al.¹ propose a promising method for localizing the seizure onset zone (SOZ) in scalp EEG recordings. The methods are accessible for implementation in most EEG laboratories. Critically, when the SOZ is ill-defined on scalp recordings, ripples may help guide intracranial electrode placement; in the future they may sometimes circumvent the need for such electrodes. Because certain filter parameters can some-

times result in spurious high frequency oscillations,² laboratories trying to reproduce these results will need the unstated filter settings used by the authors.

The authors show examples of the ripples and artifacts prior to filtering, which suggest proper settings were chosen. Three of their patients were evaluated with scalp and intracranial recordings, showing agreement between the SOZ in each. Given that prior studies of ripples were performed with depth electrode recordings, it is unfortunate that those data were excluded from the present study.

We look forward to reading more about that data, which would link prior studies to the present conclusions, in the near future. The next important steps are determining the relationship between scalp recorded ripples and surgical outcome, and perhaps to automating the method to increase interrater reliability.³

Author Response: Jean Gotman, Montreal; Luciana Andrade-Valenca, Pernambuco, Brazil; Rina Zelmann, Francois Dubeau, Montreal: Goldenholz et al. asked about our filter, which is a Finite Impulse Response filter of order 63. They also inquired about the relationship between scalp HFOs and those recorded in intracerebral electrodes. This is a complex problem for 2 reasons. First, we do not have simultaneous scalp and intracerebral recordings. Secondly, intracerebral electrodes record from a small brain volume and it is unlikely that HFOs seen at one intracerebral contact could be visible on the scalp. As we discussed,¹ HFOs visible on the scalp may come from rare HFOs that occur synchronously over a relatively large area (3 or 4 cm²). We are currently analyzing simultaneous scalp and subdural recordings to further understand the relationship between intracerebral and scalp signals. Finally, Goldenholz et al. mention the need for automatic detection of scalp-recorded high frequencies. We refer them to our recently published method.⁴ We hope that HFOs may become a marker of the epileptogenic zone⁵ and a marker of developing epileptogenesis after an initial brain injury.

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PSYCHOGENIC NONEPILEPTIC SEIZURES IN US VETERANS

Selim Benbadis, Tampa, FL: The findings of this study¹ are very important, if not surprising. It has been well known that the delay for diagnosis of psychogenic nonepileptic seizures is unacceptably long, and this suggests that it is even worse for veterans. This is partly because when veterans have any episode and a history of head injury, the assumption is that they have post-traumatic epilepsy (58% of patients in the study). This finding illustrates a larger problem of a “gap” in epilepsy care. Since the use of EEG-video for diagnosis is so delayed, it is very likely that veterans do not benefit from nondrug treatments for intractable epilepsy (i.e., epilepsy surgery and vagus nerve stimulation).

The same general rule should be followed in veterans as in the general population of seizure patients: if seizure-like episodes do not respond to medication, the diagnosis should be questioned. Many historical red flags can raise suspicion, and then—if the episodes are frequent enough—the diagnosis should be verified by EEG-video monitoring. If prolonged EEG-video monitoring is not available, outpatient EEG-video with induction can also be used and provides a similar yield.^{2,3}

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NORMAL PRESSURE HYDROCEPHALUS: MEASURE TWICE, SHUNT ONCE

Aunali S. Khaku, Kenneth M. Heilman, Gainesville, FL: In his editorial, Dr. Scharre¹ stated “Cognitive impairment in NPH [...] typically results in [...] low verbal fluency (less than 13 animals named in 1 minute).” The statement suggests that patients

Neurology®

Interictal Scalp Fast Oscillations as a Marker of the Seizure Onset Zone

Daniel M. Goldenholz, Jean Gotman, Masud Seyal, et al.

Neurology 2012;78;224-225

DOI 10.1212/01.wnl.0000410956.29629.4d

This information is current as of January 16, 2012

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