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# Ictal verbal help-seeking: Occurrence and the underlying etiology.

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**Title:** Ictal verbal help-seeking: occurrence and the underlying etiology

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## **Abstract**

**Purpose:** Ictal verbal help-seeking has never been systematically studied before. In this study, we describe a series of patients with ictal verbal help-seeking to characterize its frequency and underlying etiology.

**Methods:** We retrospectively reviewed all the long-term video-EEG reports from Jefferson Comprehensive Epilepsy Center over a 12-year period (2004-2015) for the occurrence of the term “help” in the text body. All the extracted reports were reviewed and patients with at least one episode of documented ictal verbal help-seeking in epilepsy monitoring unit (EMU) were studied. For each patient, the data were reviewed from the electronic medical records, EMU report, and neuroimaging records.

**Results:** During the study period, 5133 patients were investigated in our EMU. Twelve patients (0.23%) had at least one episode of documented ictal verbal help-seeking. Nine patients (six women and three men) had epilepsy and three patients (two women and one man) had psychogenic nonepileptic seizures (PNES). Seven out of nine patients with epilepsy had temporal lobe epilepsy; six patients had right temporal lobe epilepsy.

**Conclusion:** Ictal verbal help-seeking is a rare finding among patients evaluated in epilepsy monitoring units. Ictal verbal help-seeking may suggest that seizures arise in or propagate to the right temporal lobe.

**Key words:** Epilepsy; Help; Ictal; Psychogenic; Seizure

## **Introduction**

Seizure semiology is a valuable tool that helps make a diagnosis for ictal events. A detailed semiological description of the ictal event is particularly important in patients with suspicious paroxysmal episodes. Video-EEG monitoring with ictal recording is a valuable tool to investigate the ictal semiology and correlate it with electrophysiological brain activity. Many semiological findings have been well described in the literature; some are useful in localizing or lateralizing the epileptogenic zone in patients with epilepsy<sup>1</sup>. Ictal help-seeking has never been systematically studied before. In this study, we describe a series of patients with ictal verbal help-seeking to characterize its frequency and underlying etiology in patients admitted and investigated in an epilepsy monitoring unit. We also review the literature to depict a clear picture of ictal help-seeking.

## **Methods**

We retrospectively reviewed all the long-term video-EEG reports from Jefferson Comprehensive Epilepsy Center over a 12-year period (2004-2015) for the occurrence of the term “help” in the text body. All the extracted reports were reviewed and patients with at least one episode of documented ictal verbal help-seeking in epilepsy monitoring unit (EMU) were studied. We included patients who verbalized the term “help” while having their seizures. For each patient, the data were reviewed from the electronic medical records, EMU report, and neuroimaging records. We reviewed the video-EEG recordings for a detailed analysis of the ictal events. We performed univariate analyses using Pearson Chi-square, Mann-Whitney, Kolmogorov-Smirnov, and t-test. P value less than 0.05 was considered as significant. This study was conducted with approval by Thomas Jefferson University Institutional Review Board.

We then searched the electronic database PubMed on August 30, 2016 using the following search terms in the English language in title: “ictal and help” OR “seizure and help” OR “epilepsy and help”. Relevant publications were included.

## **Results**

During the study period, 5133 patients were investigated in our EMU. Twelve patients (0.23%) had at least one episode of documented ictal verbal help-seeking. Nine patients (six women and three men) had epilepsy and three patients (two women and one man) had psychogenic nonepileptic seizures (PNES); sex ratio was not different between the two groups ( $p = 1$ ). Eight of epilepsy patients were right handed; for one patient data was not available. Mean age at the onset of seizures ( $\pm$  standard deviation) in patients with epilepsy was 14 ( $\pm 9$ ) years and in patients with PNES was 55 ( $\pm 18$ ) years ( $p = 0.0001$ ). Mean duration of disease before the video-EEG recording ( $\pm$  standard deviation) in patients with epilepsy was 26 ( $\pm 17$ ) years and in patients with PNES was 13 ( $\pm 11$ ) years ( $p = 0.2$ ). The video-EEG recordings were available for 11 patients. Duration of seizure with verbal help-seeking in patients with epilepsy was 109 ( $\pm 19$ ) seconds and in patients with PNES was 77 ( $\pm 42$ ) seconds ( $p = 0.08$ ) (Table 1). Time from the clinical onset of the seizure to asking for “help” in patients with epilepsy was 17 ( $\pm 14$ ) seconds and in patients with PNES was 3 ( $\pm 4$ ) seconds ( $p = 0.2$ ). Table 1 shows the clinical characteristics of the patients with ictal verbal help-seeking and their seizure semiology. Seven out of nine patients with epilepsy had temporal lobe epilepsy; six patients had right temporal lobe epilepsy; five patients had mesial temporal sclerosis. Five out of nine patients with epilepsy had brain surgery for their drug-resistant seizures; just one patient was seizure free after surgery

(patient # 4 in the table). Follow-up was not available in one patient (patient # 2) and three others (patients # 5, 8, and 9) had postoperative seizures.

In our literature review, the search terms yielded an initial set of 45 publications [epilepsy and help: 34 publications; seizure and help: 9 publications; ictal and help: 2 publications]. From this pool, we could not find any published papers to contain relevant information about ictal help-seeking.

## **Discussion**

In this study we observed that “ictal verbal help-seeking” is a rare phenomenon in patients admitted in EMUs. Vocalization as a part of seizure semiology has been reported in 9-44% of patients with PNES and 60-86% of patients with epileptic tonic-clonic seizures <sup>2</sup>. Vocalization is highly variable during both epilepsy and PNES; it is often nonverbal. However, ictal speaking (i.e., understandable verbal statements) has also been reported, with both epilepsy and PNES <sup>2</sup>. “Ictal verbal help-seeking” was observed in 0.2% of the patients in our study. Of course, this may be an underestimation as we are not sure that the documentation of this phenomenon in our EMU reports has been perfect. However, this is a novel finding and this rare semiological manifestation has never been studied before.

The most common underlying etiology for ictal verbal help-seeking in our study was epilepsy. However, PNES were also associated with this phenomenon. One should keep in mind that having observed the phenomena in an EMU might have biased the result. However, this is an important consideration while dealing with this rare semiological finding in patients suspected of having epilepsy. Age at onset in our patients with PNES was in older adults; but with just three patients caution should be practiced in interpreting the results. Seizure semiology is a key

element in making a diagnosis for ictal events <sup>3</sup>. However, seizure duration or even seizure description could not definitively differentiate epilepsy from PNES in our patients. Admission at a specialized center with expertise in making the differential diagnosis of ictal events and performing video-EEG monitoring with ictal recording may settle the diagnosis in the affected patients.

In our study, epileptic ictal verbal help-seeking was just observed in patients with focal epilepsy. The most commonly observed brain MRI abnormality in patients with epileptic ictal verbal help-seeking was mesial temporal sclerosis, often on the right side. Epileptic ictal verbal help-seeking may suggest that seizures arise in or propagate to (given the average delay of 17 seconds from the clinical onset) the right temporal lobe. However, having observed the phenomena in an EMU might have biased the result. In addition, postoperative seizure recurrence in those who had epilepsy surgery obfuscates the presumed localization. No prospective study has ever looked for this semiological manifestation in patients with epilepsy. The patients who have been reported here do not represent the full spectrum of people affected with epilepsy. Epilepsy monitoring unit is an artificial environment with lots of support. Ictal verbal help-seeking may have other etiologies as well in the real world.

Epileptic ictal verbal help-seeking may be considered as an emotional phenomenon. In one study <sup>4</sup>, the authors observed that infants' performance in the instrumental helping task was related to temporal lobe activation asymmetry; helping behavior was related to relatively greater right temporal lobe activation <sup>4</sup>. Therefore, epileptic ictal verbal help-seeking may occur as a result of over-excitation of the nondominant hemisphere during the seizure. Ictal verbal help-seeking may also be considered as an ictal speech automatism. Ictal speech automatisms have been reported in 12% to 39% of patients with temporal lobe epilepsy and are often seen during seizures



originating from the nondominant temporal lobe <sup>5-8</sup>. However, in one study <sup>9</sup>, ictal speech preservation was observed in 5% of the patients with language-dominant (i.e., left) temporal lobe seizures. In our study, one right-handed patient with bitemporal disease had ictal verbal help-seeking with seizures originating from her left temporal lobe. The pathophysiology of ictal speech automatism is uncertain <sup>8</sup>. Speech automatism may be explained by two hypotheses. First, the dominant hemisphere may be released from inhibition of the nondominant hemisphere during the seizure. Second, the nondominant hemisphere may be overexcited during the seizure <sup>5</sup>. Hughlings Jackson (1874) believed that "The right is the half of the brain for the automatic use of words, the left half for both the automatic and the voluntary use." <sup>5</sup> On the other hand, it is also possible that ictal verbal help-seeking occurs in response to negative feelings at the seizure onset, when the patient has not lost their consciousness yet. In addition, it is not certain that asking for "help" is merely voicing the word or if it truly represents a help seeking behavior. The observation that time from the clinical onset of the seizures to asking for "help" in patients with epilepsy was about 17 seconds makes these latter possibilities less likely.

In conclusion, ictal verbal help-seeking is a rare finding among patients evaluated in EMUs. We add to the literature on ictal verbal help-seeking by providing information on its frequency and etiology, for the first time.

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### **Disclosures**

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