The First-Time Seizure Emergency Department Electroencephalogram Study

Andrew J. Wyman, MD*; Bruce N. Mayes, MD; Jackeline Hernandez-Nino, MD; Nigel Rozario, MS; Sandra K. Beverly, MD; Andrew W. Asimos, MD

*Corresponding Author. E-mail: Andrew.Wyman@carolinashealthcare.org.

Study objective: Seizures account for 1.2% of all emergency department (ED) visits, with 24% of those representing first-time seizures. Our primary goal is to determine whether obtaining an electroencephalogram (EEG) in the ED after a first-time seizure can identify individuals appropriate for initiation of anticonvulsant therapy on ED discharge. Our secondary goals are to determine the association of historical and clinical seizure features with epileptic EEGs and to determine the interobserver agreement for the EEG interpretation.

Methods: We conducted a prospective study including patients older than 17 years with either a first-time seizure or previous seizures without a previous EEG, all of whom were candidates for discharge home from the ED without antiepileptic drug treatment. We based seizure diagnosis on provider impression. We excluded patients with laboratory studies or neuroimaging deemed to be the seizure cause. EEG technicians performed a 30-minute EEG in the ED, which was immediately remotely interpreted by an epileptologist, who made a recommendation on antiepileptic drug initiation. We categorized EEGs as normal, abnormal but not epileptic, or epileptic. In accordance with duplicate EEG interpretation by a second, blinded epileptologist, we calculated interrater agreement for EEG interpretation and antiepileptic drug initiation. As a secondary analysis, according to questionnaires completed by patients and seizure observers, we explored the association of aura, focal symptoms, provocation, or historical risk factors with epilepsy.

Results: We enrolled 73 patients, 71 of whom had an EEG performed. All EEGs were performed within 11 hours of seizure, with an average of 3.85 hours. Twenty-four percent of patients (95% confidence interval 15% to 36%) received a diagnosis of epilepsy, and all began receiving antiepileptic drug therapy from the ED. Our final study sample size afforded only an exploratory analysis about an association between aura, focal onset, provocation, or historical risk factors with an epilepsy diagnosis. Weighted κ agreement for EEG interpretation was 0.69 (95% confidence interval 0.55 to 0.82). Of the 34 patients who followed up with an epileptologist, 9 had received a diagnosis of epilepsy in the ED, and none had antiepileptic drug medication stopped at initial follow-up.

Conclusion: ED EEG performance in adults with first-time seizures results in a substantial yield of an epilepsy diagnosis and immediate initiation of antiepileptic drug treatment. A larger study is required to determine whether historical and clinical seizure features are associated with an ED epilepsy diagnosis. [Ann Emerg Med. 2016;■:1-8.]

Please see page XX for the Editor's Capsule Summary of this article.

0196-0644/$-see front matter
Copyright © 2016 by the American College of Emergency Physicians.
http://dx.doi.org/10.1016/j.annemergmed.2016.08.004

INTRODUCTION

Background

Seizures impose a significant burden on patients and the health care system. They account for 1.2% of all emergency department (ED) visits, with 24% representing first-time seizures.[1] With 136.3 million ED visits in 2011, this equates to more than 1.6 million seizure visits and approximately 400,000 first-time seizures in the United States per year.[2] The current standard ED management approach for an uncomplicated, first generalized seizure includes performing a history and diagnostic testing to exclude seizures provoked by toxic, metabolic, structural, cardiogenic, and systemic causes.[1,3,4] For patients with both provoked and unprovoked seizures who have returned to their baseline clinical status, the 2014 American College of Emergency Physicians (ACEP) Clinical Policy on the evaluation and management of adult patients presenting to the ED with seizures recommends that antiepileptic medication not be initiated.[5]

Importance

There are several reasons why prompt performance of an electroencephalogram (EEG) and initiation of antiepileptic drug treatment is important. First, performance of an early

Editor's Capsule Summary

What is already known on this topic

Whether to begin antiepileptic medication after emergency assessment of first-time seizures is not well studied.

What question this study addressed

Adult first-time seizure patients underwent brief electroencephalogram (EEG) monitoring in the emergency department (ED) to guide decisionmaking in regard to initiating antiepileptic medication.

What this study adds to our knowledge

Twenty-four percent of patients received a diagnosis of epilepsy and had treatment initiated.

How this is relevant to clinical practice

ED-based EEG revealed substantial portions of first-time seizure patients with documented epileptic activity. Further study will be required to establish the benefit and cost-effectiveness of the ED EEG strategy.

(24- to 48-hour) EEG after a first seizure identifies epileptiform activity in 20% to 50% of patients.[6-9] Second, for a patient with an unprovoked first seizure, the majority of seizure recurrences occur within the first 1 to 2 years, with the greatest risk in the first 6 months.[6] The American Academy of Neurology's update on evaluation and management of first-time seizures found level A evidence that epileptiform activity predicts seizure recurrence, level B evidence that seizure recurrence is greatest in the first 2 years after an initial seizure, and level B evidence that antiepileptic drugs reduce seizure recurrence in those first 2 years.[6] Earlier EEG performance has a higher rate of finding epilepsy (51%) than delayed EEG performance (34%).[7] Diagnosis is important because epilepsy is a treatable condition, with 47% of patients achieving seizure remission on their first monotherapy.[10]

Goals of This Investigation

Given the literature suggesting a substantial rate of abnormal EEG results diagnostic of epilepsy in first-time seizure patients in outpatient settings and the importance of early initiation of treatment with antiepileptic drugs, our primary study goal was to determine whether obtaining an EEG in the ED after a first-time seizure could identify individuals with epilepsy who would be candidates for immediate initiation of anticonvulsant therapy on ED discharge. Our secondary goals were to determine the association of certain seizure features with epileptic EEG results and to determine the interobserver agreement for the EEG interpretation.

MATERIALS AND METHODS

Study Design and Setting

We performed a prospective trial at Carolinas Medical Center in Charlotte, NC, which is a tertiary care center with an annual ED volume of 115,000 patients. The Carolinas Healthcare System Institutional Review Board approved the study before initiation.

Selection of Participants

From July 2013 until March 2015, we enrolled patients aged 18 years and older who presented to the ED after experiencing a first-time generalized tonic-clonic seizure or a recurrent generalized tonic-clonic seizure without performance of a previous EEG. Eligible patients had to have returned to their baseline such that they would be eligible for discharge home at enrollment. We required patients to have had neuroimaging (computed tomography [CT] or magnetic resonance imaging [MRI]) available to review since their first seizure, but we required no other prescribed diagnostic evaluation. We excluded patients with laboratory studies or neuroimaging deemed to be the seizure cause and patients for whom the emergency physician determined antiepileptic drug treatment would be initiated regardless of what an EEG showed, an example being a case in which the emergency physician concluded that multiple previous seizures warranted antiepileptic drug treatment regardless of EEG results. A suspected provoked seizure was not an exclusion criterion. We determined previous EEG performance by reviewing the medical record, as well as discussion with the patient. Treating emergency physicians (available continuously) or ED research personnel (available Monday through Friday from 7 AM to 11 PM) screened for eligible patients with confirmation by study investigators. Ten months into the investigation, because of decreased availability of EEG technicians, study enrollment was restricted to 6 AM to 3 PM Monday through Friday, which ultimately limited achieving our target sample size.

Interventions

On consent and enrollment, certified EEG technicians came to the ED and performed a bedside 30-minute EEG. We performed EEG, ECG, and thoracic breathing activity recordings with a 16-channel digital video EEG using 21

Download English Version:

https://daneshyari.com/en/article/5651813

Download Persian Version:

https://daneshyari.com/article/5651813

Daneshyari.com