



Implementation of an established algorithm and modifications for the identification of epilepsy patients in the veterans health administration



Rizwana Rehman (PhD)^{a,*}, Amanda Everhart (MSN, FNP-BC)^a, Alfred T. Frontera (MD)^{a,b}, Pamela R. Kelly (DHA, MBA/HCM)^a, Maria Lopez (MD)^{a,c}, Denise Riley (APRN)^d, Sheela Sajan (MSN, RN)^a, David M. Schooff (MSN, APRN, FNP-BC)^a, Tung T. Tran (MD, MS)^{a,e}, Aatif M. Husain (MD)^{a,e}

^a Southeast Epilepsy Centers of Excellence, Durham VA Hospital, Durham, NC, United States

^b Southeast Epilepsy Centers of Excellence, University of South Florida, Tampa, FL, United States

^c Southeast Epilepsy Centers of Excellence, University of Miami, Miami, FL, United States

^d Southeast Epilepsy Centers of Excellence, North Florida/South Georgia Veterans Health System, Gainesville, FL, United States

^e Duke University Medical Center, Durham, NC, United States

ARTICLE INFO

Article history:

Received 28 June 2016

Accepted 13 September 2016

Available online 23 September 2016

Keywords:

Epidemiology

Epilepsy

Prevalence

Veterans health administration data

Administrative databases

ABSTRACT

Identification of epilepsy patients from administrative data in large managed healthcare organizations is a challenging task. The objectives of this report are to describe the implementation of an established algorithm and different modifications for the estimation of epilepsy prevalence in the Veterans Health Administration (VHA). For the prevalence estimation during a given time period patients prescribed anti-epileptic drugs and having seizure diagnoses on clinical encounters were identified. In contrast to the established algorithm, which required inclusion of diagnoses data from the time period of interest only, variants were tested by considering diagnoses data beyond prevalence period for improving sensitivity. One variant excluded data from diagnostic EEG and LTM clinics to improve specificity. Another modification also required documentation of seizures on the problem list (electronic list of patients' established diagnoses). Of the variants tested, the one excluding information from diagnostic clinics and extending time beyond base period of interest for clinical encounters was determined to be superior. It can be inferred that the number of patients receiving care for epilepsy in the VHA ranges between 74,000 and 87,000. In the wake of the recent implementation of ICD-10 codes in the VHA, minor tweaks are needed for future prevalence estimation due to significant efforts presented. This review is not only beneficial for researchers interested in VHA related data but can also be helpful for managed healthcare organizations involved in epilepsy care aiming at accurate identification of patients from large administrative databases.

Published by Elsevier B.V.

1. Introduction

Surveillance programs aimed at optimal care of patients and efficient resource management require accurate estimation of dis-

Abbreviations: AED, anti-epileptic drug; ECoE, Epilepsy Centers of Excellence; FY, fiscal year; HAM VHA, Holden's algorithm modification for veterans health administration; ICD-09 CM, International Classification of Diseases, 9th Revision, Clinical Modification; PBM, pharmacy benefits services; VHA, Veterans Health Administration; VSSC, Veterans Support Service Center.

* Corresponding author at: U.S. Department of Veterans Affairs, Epilepsy Centers of Excellence – Southeast Durham VA Hospital, Department of Medicine (111D) 508 Fulton Street Durham, NC 27705, United States.

E-mail address: Rizwana.Rehman@va.gov (R. Rehman).

<http://dx.doi.org/10.1016/j.epilepsyres.2016.09.012>

0920-1211/Published by Elsevier B.V.

ease frequency measures (ILAE Commission Report, 1997; National Research Council, 2012; Thurman et al., 2011). Veterans Health Administration (VHA) is the largest among many managed healthcare organizations using lean data- driven processes for achieving best outcomes (Cosgrove et al., 2013). In alignment with this goal, VHA established the Epilepsy Centers of Excellence (ECoE) under Public Law S. 2162, where US Congress improved the care of returning soldiers of current wars in response to known association between traumatic brain injury and epilepsy (PL S.2162, 2008). Recognizing the importance of understanding the population served, ECoE policy makers initiated efforts for the identification of VHA epilepsy patients as a part of surveillance and quality improvement activities. Case identification, on the basis of established standard

clinical definitions of epilepsy, using chart reviews was not practical (VHA serves a large number of patients receiving care at more than 140 medical centers and associated small community based outpatient facilities). In an effort to mitigate this, an established algorithm developed by Holden et al. was adopted to identify epilepsy patients getting care in the VHA.

To summarize, for a time period of interest, Holden's algorithm (see Fig. 1a) identifies epilepsy patients by cross match of The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes for seizures (345.xx, 780.39) on clinical encounters and prescription of anti-epileptic drugs (AEDs) using a unique identifier for each patient (Holden et al., 2005). This algorithm was developed specifically for identification of epilepsy patients enrolled in managed care organizations with large administrative networks and will be referred to as "Holden's algorithm" in this article.

Holden's algorithm was previously used and validated for the VHA geriatric population (Pugh et al., 2008). Implementation of Holden's algorithm in the general Veterans population for consecutive fiscal years (FY) 2009–2011 raised concerns about the sensitivity and specificity of Holden's algorithm (Fig. 2). An unexpected reduction of 7818 epilepsy patients was observed from FY10 (68,909 identified epilepsy patients) to FY11 (61,091 identified epilepsy patients). In addition, results indicated that out of 67,217 patients identified as having epilepsy during FY09, only 46,934 received follow up care in FY10. Whereas, among 68,909 patients identified for FY10, only 49,805 returned for epilepsy care during FY11. There were approximately 4000 patients identified by the algorithm in FY09 who did not receive epilepsy care in the VHA during FY10 according to criteria of Holden's algorithm, but were identified by the Holden's algorithm in FY11 again. These inconsistent and perplexing results prompted an investigation of validity of Holden's algorithm for general VHA epilepsy patients. Results of investigation showed that adjustments in the Holden's algorithm were necessary to improve the sensitivity and specificity of original algorithm for VHA explicit use. Successive modifications of "Holden's algorithm" were explored periodically in quest of the optimal results.

This article summarizes the authors' efforts to modify Holden's algorithm for optimal and accurate results for epilepsy prevalence estimation among VHA patients. For the sake of clarity modifications to the original Holden's algorithm have been given abbreviated names, and a pictorial description of methodology is shown in Fig. 1. A summary of study results is provided in Table 1.

This review could be useful for researchers who wish to adopt Holden's algorithm and its variants for prevalence estimates of epilepsy. For VHA epilepsy related research and management identification of epilepsy population is essential for organizational assessments to improve outcomes. This review could be helpful for large managed care organizations utilizing administrative databases for supervision of epilepsy patients. The significant efforts documented here can lead to foundations of future algorithms that will require less effort for identification of the epilepsy population in the wake of implementation of ICD-10 codes in the VHA.

2. Methods

The VHA Support Service Center (VSSC) provided data based on ICD-09-CM seizure codes (345.xx or 780.39) from inpatient and/or outpatient encounters. Encounter data were used in conjunction with pharmacy data provided by national VHA Pharmacy Benefits Management (PBM) to identify patients prescribed AEDs for at least 30 days. AEDs considered included carbamazepine, ethosuximide, felbamate, gabapentin, lacosamide, lamotrigine, lev-

etiracetam, oxcarbazepine, phenobarbital, phenytoin, pregabalin, primidone, tiagabine, topiramate, valproate, vigabatrin, and zonisamide. In all four methods were used to identify epilepsy patients. For each method prescription of AEDs during the required time period was mandatory. However, using a unique identifier for each veteran the cross match with diagnoses data was considered from time periods of different lengths in implementation of different methods. In the implementation of one modification of Holden's algorithm, a variable "Problem List" was used. This variable is available to providers in Computerized Patient Record System (CPRS) and is utilized for documentation of a patient's diseases and conditions. Problem List data were provided by VSSC. Periodic studies and subsequent data were reviewed and approved by the national VHA neurology program office for surveillance and publication. Statistical analyses were performed using SAS software version 9.2 (SAS Institute, Cary, NC, USA).

2.1. Holden's algorithm for general VHA population

ECoE adopted Holden's algorithm to identify trends of epilepsy patient population in the VHA for three consecutive Fiscal Years, FY 09–FY11. For each fiscal year, epilepsy patients were identified by the prescription of an AED for at least thirty days among patients who had a concurrent seizure diagnosis on either an inpatient or outpatient clinical encounter (Fig. 1a). To explain the count reduction between FY10 and FY11 (Fig. 2), the ECoE decided to investigate primary reasons for the loss of identified patients by evaluating electronic charts at Durham, NC, Miami and Tampa, FL. Evaluated patients were identified as having epilepsy in FY10 but were not captured in FY11 for epilepsy care by implementing the Holden's algorithm.

2.2. Validation of Holden's algorithm

For validation confirmed epilepsy was defined as documentation of unprovoked seizures at any time in clinical notes and prescribed AEDs for epilepsy treatment by a physician. Providers trained for epilepsy care searched clinical notes across the life of the records for possible references to unprovoked seizures. Clinical notes were also examined to investigate whether patients received any VHA care after FY10.

2.3. Holden's algorithm modification (Prescribed AEDs and extended time period for seizure encounters) for VHA variant 1 (HAM VHA1)

As shown in Fig. 1b Holden's algorithm was modified to obtain prevalence estimates for FY11 in the following way. For FY11 (Oct 01, 2010–Sep 30, 2011), patients prescribed AEDs during required fiscal year FY11 were examined for a seizure encounter for two prior years FY09–FY10 as well as required year FY11 (three consecutive years). Thus, time period for encounter data was extended from one year to three years to account for stable and chronic patients. The above modification of Holden's algorithm will be described as HAM VHA1.

2.4. Holden's algorithm modification (Prescribed AEDs and extended time period for seizure encounters excluding diagnostic data) for VHA variant 2 (HAM VHA2)

The original Holden's algorithm and variant HAM VHA1 were implemented using encounter data from all clinics including neurodiagnostic clinics. HAM VHA2 was another variant used to obtain prevalence estimates for FY12 (Oct 01, 2011–Sep 30, 2012), where patients with seizure diagnosis on clinical encounters from EEG and prolonged video EEG monitoring clinics were excluded from three

Download English Version:

<https://daneshyari.com/en/article/6015067>

Download Persian Version:

<https://daneshyari.com/article/6015067>

[Daneshyari.com](https://daneshyari.com)