ORIGINAL RESEARCH

Impact of Clinical Pharmacists on Access to Care in an Epilepsy Clinic

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Background: Epilepsy affects about 1% of the world population and is one of the most burdensome diseases in terms of disability-adjusted life-years. The demand for neurologists and epileptologists is expected to exceed current supply by 2025. One potential strategy to increase access to epilepsy care is to utilize clinical pharmacist practitioners (CPPs) with a broad scope of practice.

Methods: Appointments at the William S. Middleton Memorial Veterans Hospital (WSMVH) epilepsy clinic in Madison, Wisconsin, were reviewed to determine the percentage of appointments completed by a CPP or clinical pharmacy resident from October 2019 to May 2021. Additionally, a retrospective chart review was completed on 446 veterans to identify the types of interventions made by a CPP or clinical pharmacy resident at each appointment from October 2017 to June 2021.

Results: The CPP or clinical pharmacy resident held approximately 43% of 591 total appointments and spent a mean 27 minutes with each patient. Medication interventions occurred at 27% of 446 appointments in the retrospective chart review. Half (50.4%) of all patients seen by a CPP completed at least 1 mental health screening.

Conclusion: The integration of a CPP WSMVH epilepsy clinic allowed for greater and more timely access to care and allowed for the epileptologists to focus their time on new consults, Epilepsy Monitoring Unit admissions, and higher acuity cases.

Epilepsy affects about 1% of the world population and is one of the most burdensome in terms of disability-adjusted life-years.[1,2] Veterans are at increased risk of developing epilepsy when compared with the general population due to a variety of factors, including a higher frequency of traumatic brain injuries.[3] A recent study from the US Centers for Disease Control and Prevention found that veterans who developed epilepsy during their service not only had a higher rate of mental and physical comorbidities, but also were 2.6 times more likely to die compared with veterans without epilepsy.[4]

Oral antiseizure medications (ASM) remain the mainstay of outpatient epilepsy treatment. Patterns of ASM use are complex within the US Department of Veterans Affairs (VA) patient population, particularly within patients at the Epilepsy Centers of Excellence (ECoE). For example, many patients are transitioned from older ASMs with greater adverse effects (AEs) to better tolerated newer generation ASMs or polytherapy regimens with complex pharmacokinetic profiles and drug interactions.[5] Multiple factors are considered when choosing an ASM, including age, sex, epilepsy/seizure type, comorbidities, past medication trials, AEs, and drug interactions. The complex pharmacologic profile of both older and newer ASMs can confound the optimal management of epilepsy, and suboptimal management can lead to neurologic, psychological, physical, and social consequences, including sudden unexplained death in epilepsy.[6,7] Psychiatric and behavioral problems are seen in up to 30% of patients with newly diagnosed epilepsy and 50% in those with pharmacoresistant epilepsy.[8] Early screening, detection, and treatment for psychiatric comorbidities are an integral part of evidence-based care in epilepsy.

Being familiar with ASM AEs and comorbid conditions such as anxiety and depression can allow for quick identification and intervention to improve safety and quality of life. A 2007 population-based study found that measures of suicidality had a strong association with epilepsy, and performing mental health screenings, such as the Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder Screener (GAD-7), and the Brief Irritability Test (BITe), can assist in identifying those patients at risk.[9]

During the COVID-19 pandemic, it has become increasingly clear that the health care sector is facing increasing pressure. The combination of patient acuity as well as critical health care professional (HCP) shortages may be of particular concern in certain specialty clinics where access to practitioners may already be limited. While this is a multifaceted problem, a pragmatic approach would be to increase the use of clinicians, such as clinical pharmacist practitioners (CPPs).

The William S. Middleton Memorial Veterans Hospital (WSMVH) in Madison, Wisconsin, is 1 of 17 VA ECoE sites. The VA ECoE provides

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TABLE 1 Epilepsy Clinic Encounters

Professions	Visits, No. (%)
Clinical pharmacist resident	156 (26.4)
Nurse practitioner	139 (23.5)
Attending epileptologist	108 (18.3)
Clinical pharmacist practitioner	99 (16.8)
Fellow	41 (6.9)
Psychiatrist	22 (3.7)
Medical resident	19 (3.2)
Neurosurgery resident	4 (0.7)
Psychiatry resident	3 (0.5)
Total	591 (100)

high-quality, comprehensive epilepsy evaluation and care to veterans. In fiscal year (FY) 2020, the 17 sites provided care to 5544 veterans.[10] The WSMVH epilepsy clinic sees about 400 veterans each year, receiving referrals from other VA medical centers, and prescribes ASMs, neuromodulation devices, and resective surgeries for epilepsy. The multidisciplinary team consists of an epileptologist, neurophysiology fellow, psychiatrist, nurse practitioner, CPP, and neurology residents. The WSMVH epilepsy clinic has employed CPPs at their highest level of clinical practice authority since 1991.

The WSMVH epilepsy clinic is open 4 hours once weekly. The clinic offers fourteen 30-minute appointment slots either in person or via telehealth. The epileptologist reviews patient charts prior to clinic and assigns each patient to the appropriate HCP. When making the determination to assign a patient to a CPP or pharmacy resident, the epileptologist considers current treatment response, mental health issues as well as medication-related concerns (eg, potential pharmacokinetic/pharmacodynamic interactions, AEs, adherence). The CPP can independently lead routine follow-up appointments and address acute as well as ongoing ASM therapy needs. Pharmacy residents are fully integrated into the clinic workflow, seeing assigned patients independently when appropriate but ensuring that each patient has access to either the epileptologist, CPP, or psychiatrist prior to finalizing the treatment plan. The epilepsy clinic rotation is required for first-year pharmacy residents and is an elective rotation in the second year.

While this level of service has been in place at WSMVH for more than 3 decades, a systematic evaluation on workload and clinical impact has not been conducted.[11] The purpose of this analysis is to evaluate and quantify the breadth and impact of CPPs in this specialty setting. The WSMVH/University of Wisconsin-Madison institutional review board deemed this quality improvement study exempt from review.

METHODS

This study was a single-center, retrospective, quality improvement project evaluating the impact of a CPP and clinical pharmacy resident have within the WSMVH epilepsy clinic on access to epilepsy care and medication management. The secondary outcomes were the types of interventions made by the CPP and mental health screening performed.

Between October 2019 and May 2021, 591 appointments were scheduled at the epilepsy clinic for medical, psychiatry, neurosurgery, and pharmacy residents; the epileptologist; CPP; psychiatrist; epilepsy fellow; or nurse practitioner. A retrospective chart review of the 446 patients seen by either a CPP or clinical pharmacy resident from October 2017 to June 2021 assessed pharmacist-led interventions made during each appointment. The following treatment interventions were assessed: medication initiations/discontinuations, dose changes, and nonpharmacologic interventions, including education. Additionally, any mental health screenings completed, consultations to other specialties placed, or laboratory tests ordered were documented.

RESULTS

In the epilepsy clinic, 591 appointments were completed from October 1, 2019, to May 31, 2021. Of those appointments, 255 (43.2%) were led by pharmacists; 156 (26.4%) by pharmacy residents and 99 (16.8%) by CPPs (16.8%) (Table 1). Appointments held by other HCPs included 139 (23.5%) by nurse practitioner, 108 (18.3%) by the attending epileptologist, 41 (6.9%) by fellows, 22 (3.7%) by psychiatrists, 19 (3.2) by medical residents, 4 (0.7%) by neurosurgery residents, and 3 (0.5%) by psychiatry residents. Medication interventions included 55 (11.8%) dose increases, 52 (11.1%)

medication initiations, and 32 (6.9%) dose decreases (Table 2). Mental health screening was conducted for 229 (49.1%) patients with PHQ-9, 225 (48.3%) with GAD-7, and 111 (23.8) with BITe. Some veterans received multiple screeners at a clinic visit, and others received none (most commonly during telephone follow-up appointments). The mean time spent with each patient was 27 minutes.

TABLE 2 Pharmacist-Led Interventions

Intervention	No. (%)
Dose increase	55 (11.8)
Medication initiation	52 (11.1)
Dose decrease	32 (6.9)
Medication discontinuation	14 (3.0)
Screening tools	
Patient Health Questionnaire, 9 question	229 (49.1)
Generalized Anxiety Disorder, 7 question	225 (48.3)
Brief Irritability Test	111 (23.8)
Consult placed	46 (9.9)

DISCUSSION

Within the private sector, access to a neurologist or epileptologist is limited, and the US Health Resources and Services Administration National Center for Workforce Analysis projected that the demand for these specialists would exceed supply by 2025.[12] In 2017, Kobau and colleagues found that only 1 in 10 adults with epilepsy saw a neurologist within the year, similar to previous years. As demand for specialty care exceeds capacity, additional members of the health care team are needed to ensure timely, effective, and safe care for patients with epilepsy.

One way to increase health care access is to use an interdisciplinary model of care, integrating pharmacists in the management of epilepsy in collaboration with other HCPs, a strategy that has been endorsed by the American Epilepsy Society (AES).[13] As experts in pharmacotherapy, pharmacists can uniquely provide medication management for this complex disease as ASMs continue to remain the first-line treatment.[14]

In addition to increased demand for specialty services, there also is an increase in health care spending with a push to limit additional spending. In 2016, despite similar health care use in other high-income countries, health care costs are approximately twice as much in the US, mostly driven by prices of pharmaceuticals and administrative costs.[15] Bond and colleagues evaluated 9380 Medicare patients with epilepsy or seizure disorders throughout US hospitals in 1998.[16] They found that hospitals without pharmacist-managed ASM therapy had Medicare charges that were 11.2% higher than hospitals with pharmacist-managed therapy. Many factors contribute to the rise in cost, including an increase in laboratory charges for serum drug assays, legal litigations related to drug AEs, and an increase in hospital length of stay (about 14 additional days). Similar to pharmacist-managed anticoagulation, vancomycin, and aminoglycoside therapy, direct involvement of pharmacists with ASM management decreases health care costs.[14]

The American Academy of Neurology (AAN) developed 8 epilepsy quality measures: seizure type and frequency, etiology or epilepsy syndrome, review of electroencephalogram and imaging findings, counseling of ASM AEs, consideration of surgical treatment of intractable epilepsy, epilepsy-specific safety issues, and counseling for women of childbearing potential on contraception and pregnancy. These measures serve as a guide for evidence-based therapy and standardization of epilepsy care.[17] Additionally, bone health, depression, and awareness of sudden unexplained death in epilepsy are increasing in importance when providing quality epilepsy care. Wasade and colleagues surveyed Michigan neurologists and found that only 37% of the respondents addressed ASM AEs at every clinic visit. They also found that just 26% of responding neurologists inquire about depression at every clinic visit, and 17% inquire only once a year. In our practice, screening for depression, suicidality, and counseling on ASM AEs are routinely provided by CPPs during each clinic visit.

Within the VA, CPPs are granted a scope of practice that allows them to perform comprehensive medication management, including but not limited to, prescribing medication regimens, ordering laboratory tests and diagnostic studies, and performing physical assessments. In our practice, the most common interventions made by CPPs were patient-focused counseling, bone health screening, mental health triage and referral, and ASM regimen adjustments. Assessment of ASM adherence also was noted to be an active area of CPP-patient

engagement. These most common interventions align well with the AAN quality measures. It is now well recognized that nonadherence in patients with epilepsy not only can lead to loss of seizure control, but injury and death as well.[18,19] Malek and colleagues found that patients with epilepsy who are nonadherent to their ASM regimens have a 3-times greater risk of mortality compared with those who were adherent.[20] Adherence to the appropriate medication regimen in epilepsy can result in seizure-freedom in 70% of patients; therefore, exploring nonadherence in this population is crucial.[21]

The COVID-19 pandemic precipitated changes to the health care industry, including the heavy reliance on telehealth. Following the Wisconsin stay-at-home order on March 25, 2020, all nonessential face-to-face appointments at the WSMVH halted. The epilepsy clinic transitioned the majority of appointments to either telephone or VA Video Connect (VVC), which is a program on the veteran's computer, tablet, or mobile device upon which the appointment is held. Although it became more challenging to obtain a mental health screening during virtual appointments and the frequency did decrease, patients were asked for a subjective report of their mood during each telephone or video appointment. The AES has since put forth a statement of support for the continuation of telehealth following the COVID-19 pandemic due to the flexibility that telehealth provides people with epilepsy. Additionally, the AES taskforce provided suggestions for continued pharmacist engagement within the epilepsy care team, including the triaging of patients, management of ASMs, and involvement in the delivery of telehealth.

WSMVH clinic CPPs and clinical pharmacy residents saw a high proportion of all veterans, which allowed the epileptologist time to focus on new consults and higher acuity cases. At WSMVH, screening for depression with the PHQ-9 must be completed at least annually for any patient regardless of their involvement in mental health care. This typically occurs at a patient's annual primary care visit. Patients who receive epilepsy clinic care will often receive more frequent and thorough depression screening with the PHQ-9, in addition to screening for anxiety, irritability, and sleep disorders. CPPs ability to identify, evaluate, and triage psychiatric concerns ensures that the patient has support and care.

Limitations

There is limited research available on the impact that a CPP has on medication management and access to care within an epilepsy clinic, especially those with a scope of practice. One limitation of this retrospective chart review is that the appropriateness of each medication intervention was not assessed; therefore, the impact of each intervention was not captured. Additionally, this single-site study of veterans may not reflect the general population. However, we believe that this model could be adapted to nonspecialty neurology practices. Of note the scope of this study did not include a comparison of medication interventions for the other specialties within the clinic.

CONCLUSIONS

The integration of a CPP and pharmacy residents into the WSMVH epilepsy clinic has allowed for greater and more timely access to care, managing 43.2% of all patients within the clinic during the study. Pharmacy scope of practice allows for collaborative autonomy with ASM adjustments and for the epileptologist time to focus on higher acuity cases. In settings where pharmacists do not have prescriptive status, medication management services, such as comprehensive medication reviews, identifying drug-drug and drug-disease interactions, recognizing adherence barriers, and medication safety surveillance, can still be performed to improve management of epilepsy.

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Ethics and consent

This quality improvement study was determined to be exempt from review by the William S. Middleton Memorial Veterans Hospital/University of Wisconsin-Madison Institutiuonal Review Board.

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