The alcohol detoxification protocol and creation of the e-consult at Central Texas Veterans health care system

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ABSTRACT

Within the Central Texas Veterans Health Care System, the alcohol-related disorder readmission rate has been recognized as an area that needs improvement. The aim of this quality improvement initiative was to develop an alcohol detoxification protocol. This protocol assesses the need for inpatient vs outpatient management of alcohol withdrawal and provides guidance pertaining to medication options, with emphasis on prescribing gabapentin for treatment of alcohol withdrawal. The protocol also contains the alcohol detox e-consult, which prompts a physician to call the patient daily to assess alcohol withdrawal, ability to abstain from alcohol, medication compliance, interest in substance abuse treatment programs, and appropriate follow-up. After implementing the protocol and e-consult, we saw a reduction in the admission rate of alcohol-related disorders and patients found the consult helpful.

KEYWORDS Admission/readmission rate; alcohol withdrawal; alcohol-related disorder; quality improvement

The Central Texas Veterans Health Care System (CTVHCS) has intermittently been above the national average for the readmission rate for alcohol-related disorders. Such disorders have been the third most prevalent diagnosis for admission, prompting a quality improvement initiative. Current literature supports the use of gabapentin for the treatment of alcohol withdrawal by reducing symptoms and the probability of consuming alcohol during the withdrawal period when compared to lorazepam.¹ Naltrexone is also helpful for alcohol cessation. The aim of this project was to develop an alcohol detoxification protocol for use in the emergency department (ED) and inpatient setting and determine if it improved the rates of alcohol-related admissions and readmissions and improved patient satisfaction.

METHODS

An alcohol detoxification protocol was developed to assess the need for admission for alcohol withdrawal and provide guidance pertaining to medication options as well as placement (Figure 1). The protocol includes the alcohol detox e-consult order option, which prompts an internal medicine physician to call the patient daily for 5 days to assess signs or symptoms of withdrawal, the patient's ability to abstain from alcohol, compliance with the outpatient medication regimen (gabapentin/

lorazepam, vitamins, and naltrexone), need for rescue medication, interest in substance abuse treatment programs/domiciliary/mental health, appropriate follow-up, and need for referral to the ED for further aid in management. The protocol and e-consult were created by the internal medicine and psychiatry departments at CTVHCS. Several educational avenues were utilized to disseminate the protocol and e-consult. Hospitalists were informed during a weekly meeting, and medical residents were educated during a morning report. The ED physicians and hospitalists received the protocol by email on several occasions, and the protocol was posted as a flyer in the ED as a reference.

Any veteran seen in the ED or inpatient setting with a primary or secondary alcohol-related disorder diagnosis was included in the study. The outcome variables included admissions and readmissions rates due to alcohol use disorder and patient satisfaction. Patients were surveyed during the follow-up phone calls on the fifth day of the e-consult to assess their level of satisfaction with the consult and if the intervention aided them in abstaining from alcohol.

The number of alcohol-related admissions and readmissions for each quarter was modeled as a function of the log of the total admissions or readmissions per quarter as an offset, the intervention period (preintervention vs postintervention), and time, in a Bayesian Poisson regression model. The following prior

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Figure 1. Alcohol detoxification protocol.

probability distributions were used (location and scale parameters in parentheses): a normal (-3, 1 for admissions and -2, 1 for readmissions) prior on the intercept parameter, a normal (0, 0.5 for both) prior on the coefficient parameter for intervention period, and a normal (0, 0.15 for both) prior on the coefficient parameter for time. Prior predictive checks indicated that these priors produced data within the realm of what is clinically possible. Rhat was 1.00 for all parameters. All models were run in the brms package in R version 3.5.1.^{2,3}

Results are expressed as incident rate ratios and as a mean percentage reduction or percentage increase in the alcohol-related admissions and readmissions rate per quarter in the treatment group compared to the control group. The uncertainty associated with the estimate is reported as 95% uncertainty intervals (lower and upper bounds in parentheses following the estimate).

RESULTS

There were 10 quarters in the preintervention period and 3 quarters in the postintervention period. The mean (and standard deviation) for total admissions was 1711 (77) for the

preintervention period and 1752 (49) for the postintervention period. The mean (and standard deviation) for alcohol-related admissions was 59.5 (9.3) for the preintervention period and 41.7 (9.1) for the postintervention period. The mean (and standard deviation) for alcohol-related readmissions was 11.1 (3.4) for the preintervention period and 4.0 (1.0) for the postintervention period.

The model-estimated incidence rate for alcohol-related admissions for the postintervention period was 0.77 (0.60, 0.99) times the incidence rate of alcohol-related admissions during the preintervention period. In other words, the model estimated mean (95% uncertainty intervals) rates of alcohol-related admissions were 23% (1%–40%) lower in the postintervention period than in the preintervention period. *Figure 2a* shows the alcohol-related admissions rate over time. The model-estimated incidence rate for alcohol-related readmissions for the postintervention period was 0.73 (0.39, 1.23) times the incidence rate of alcohol-related readmissions during the preintervention period. In other words, model-estimated mean rates (95% uncertainty intervals) of alcohol-related readmissions were 27% lower in the postintervention period than in the preintervention period, but

Figure 2. Alcohol-related (a) admissions rate and (b) readmissions rate over time.

the 95% uncertainty intervals for the mean provided evidence of both an increase and a decrease (61% lower to 123% higher rates) for post- compared to preintervention, indicating large uncertainty about the direction of the effect. *Figure 2b* shows the alcohol-related readmissions rate over time.

DISCUSSION

Alcohol-related disorder is a common diagnosis that plagues millions of Americans.⁴ According to the Centers for Disease Control and Prevention, alcohol-attributable deaths due to excessive alcohol use from 2006 to 2010 are estimated at 106,765 people in the United States.⁵ Alcohol is the third most common cause of preventable deaths, following tobacco and being physically inactive/eating poorly.⁴

This quality improvement initiative set out to reduce alcohol-related admissions and readmissions rates at CTVHCS through development of the alcohol detoxification protocol and creation of the alcohol detox e-consult. After these interventions were implemented, we saw a reduction in the admission rate of alcohol-related disorders. However, we saw little change in the alcohol-related readmissions rate over the study period. This variable was affected by one veteran who continues to “bounce back” to the hospital within a month.

The protocol highlighted the importance of utilizing gabapentin compared to lorazepam and recommended use of naltrexone to decrease cravings in addition to folic acid, multivitamin, and thiamin supplementation. Gabapentin has been shown to be effective for management of alcohol

withdrawal in the outpatient setting,¹ and to our knowledge this is the first study to investigate gabapentin for use of alcohol withdrawal in the inpatient setting. We are not sure if use of benzodiazepines had any direct or indirect effect on admissions and readmissions.

Subjectively, patients found the consult helpful and were satisfied with their care. A limitation of this study is the availability of only three quarters of postintervention data. This prevents the detection of long-term trends in the outcome variables in the postintervention period and results in the large uncertainty estimates for the effect of our intervention.

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