Pharmacist Impact on Protocol Driven Dexmedetomidine in Severe Alcohol Withdrawal

Background

Severe alcohol withdrawal (AW) results in frequent admissions to the intensive care unit (ICU) due to adrenergic, psychiatric, metabolic and respiratory dysfunction. Most patients receive a combination of benzodiazepines (BZD) and antipsychotics. Literature that is more recent has shown the potential for phenobarbital as a treatment option because of continued BZD shortages. Dexmedetomidine, an alpha-2 receptor agonist, is a continuous intravenous option for those with worsening symptoms despite first line therapy. It possesses anxiolytic, hypnotic/sedative actions, and is associated with less respiratory depression and mechanical ventilation (MV). However, dexmedetomidine does not treat the underlying cause of AW, increasing the risk for delirium tremens (DTs) and seizures, and has resulted in prolonged hospitalization. In 2016, Cox Medical Center Branson implemented protocol driven dexmedetomidine administration to limit and outline its use in severe AW. Despite this change, 2017 data showed dexmedetomidine use and ICU length of stay (LOS) increased with reduced BZD use from previous years. This study reviewed pharmacist-guided changes implemented in 2018 to determine their impact on ICU length of stay (LOS) and frequency of MV.

Methods

This single center retrospective cohort compared pre and post protocol updates from January to December 2017 and November 2018 to September 2019. Prior to protocol change, dexmedetomidine defaulted to a 72-hour (hrs) duration with scheduled oral diazepam for 48 hrs and no option for phenobarbital. After updates, dexmedetomidine duration reduced to a 48 hrs duration with scheduled intravenous lorazepam pushes and phenobarbital when indicated per protocol. Provider and nursing education on dosing of BZDs, dexmedetomidine, and phenobarbital occurred. Included patients were adults diagnosed with severe AW with ICU stay $\geq$ 24 hrs and received severe BZD and dexmedetomidine protocols. Excluded patients had ICU stay < 24 hrs, severe AW protocols used for indications other than AW, or protocols ordered but not administered.

Results

After screening, 19 pre-updated protocol patients met inclusion and 22 post. Baseline characteristics revealed that those receiving the updated protocol had increased mean drinks per day (18.85 vs 60.00; *P=.03*), DTs frequency (63% vs 95%; *P=.01*), seizure history (11% vs 32%; *P=.14*), and alcohol levels negative on admission or not obtained (21 % vs 54%, P=*.05*). No difference in mean ICU LOS (7.67 days vs 7.17 days; *P= .27*) occurred after randomization and adjustment to 18 patients per group. Mean lorazepam equivalents administered increased pre (39.52 mg vs 57 mg; *P=.31*) and post (50.93 mg vs 129.35 mg; *P=.01*) dexmedetomidine initiation. Phenobarbital initiation occurred in 12 of the 22 patients with no reported adverse effects. Mean dexmedetomidine duration declined (77.92 hrs vs 63.36 hrs, *P=.41*) and MV frequency reduced (26% vs 9%; *P=.21*). Intubation due to over sedation did not occur after protocol updates.

Conclusion

Pharmacist impact on severe AW management, while not statistically significant, may assist in maintaining ICU LOS and MV frequency.