

First-line medication dosing in pediatric refractory status epilepticus

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Abstract

Objective

To identify factors associated with low benzodiazepine (BZD) dosing in patients with refractory status epilepticus (RSE) and to assess the impact of BZD treatment variability on seizure cessation.

Methods

This was a retrospective study with prospectively collected data of children with convulsive RSE admitted between June 2011 and January 2019. We analyzed the initial and total BZD dose within 10 minutes of treatment initiation. We used logistic regression modeling to evaluate predictors of low BZD dosing and multivariate Cox regression analysis to assess the impact of low BZD dosing on time to seizure cessation.

Results

We included 289 patients (55.7% male) with a median age of 4.3 (1.3-9.5) years. BZDs were the initial medication in 278 (96.2%). Of those, 161 patients (57.9%) received a low initial dose. Low initial BZD doses occurred in both out-of-hospital (57 of 106; 53.8%) and in-hospital (104 of 172; 60.5%) settings. One hundred three patients (37.1%) received low total BZD dose. Male sex (odds ratio [OR] 2, 95% confidence interval [CI] 1.18-3.49; $p = 0.012$), older age (OR 1.1, 95% CI 1.05-1.17; $p < 0.001$), no prior diagnosis of epilepsy (OR 2.1, 95% CI 1.23-3.69; $p = 0.008$), and delayed BZD treatment (OR 2.2, 95%

CI 1.24-3.94; $p = 0.007$) were associated with low total BZD dose. Patients who received low total BZD dosing were less likely to achieve seizure cessation (hazard ratio 0.7, 95% CI 0.57-0.95).

Conclusion

BZD doses were lower than recommended in both out-of-hospital and in-hospital settings. Factors associated with low total BZD dose included male sex, older age, no prior epilepsy diagnosis, and delayed BZD treatment. Low total BZD dosing was associated with decreased likelihood of Seizure cessation.

Classification of evidence

This study provides Class III evidence that patients with RSE who present with male sex, older age, no prior diagnosis of epilepsy, and delayed BZD treatment are more likely to receive low total BZD doses. This study provides Class III evidence that in pediatric RSE low total BZD dose decreases the likelihood of seizure cessation.

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