

Abstract

Title: Assessing the Efficacy and Safety of Undiluted Levetiracetam for Rapid Intravenous Push in Pediatric Emergency and Inpatient Settings

Background: Status epilepticus (SE) is a critical neurological condition requiring rapid treatment. Levetiracetam is a commonly used second-line medication due to its safety, minimal monitoring, and fewer drug interactions. This study evaluates whether administering undiluted levetiracetam reduces the time from medication order to administration, potentially improving patient outcomes.

Methods: A pre-post quasi-experimental study was conducted via a retrospective chart review at OSF Healthcare Children's Hospital of Illinois. Pediatric patients who received diluted levetiracetam (Jan 2021–June 2022) were compared to those who received undiluted levetiracetam (Jan 2023–June 2024). The primary outcome measured was time from order to administration. Secondary outcomes included hemodynamic disturbances, intubation rates, and the need for additional seizure medications.

Results: Results showed a significant reduction in administration time in the post-implementation group (33.5 min vs. 46.0 min, $p = 0.001$). A subgroup analysis in the emergency department confirmed similar reductions (31.5 min vs. 43.5 min, $p = 0.003$). No significant differences were found in secondary outcomes.

Conclusion: Administering undiluted levetiracetam via rapid intravenous push significantly reduces administration time, enhancing seizure management in pediatric patients without increasing adverse effects.