

**BACKGROUND<sup>1,2,3</sup>**

- Status epilepticus (SE) is defined as prolonged or repetitive seizures lasting over 5 minutes, or multiple seizures without recovery between them.
- Initial treatment involves benzodiazepines; if seizures continue, levetiracetam is typically used as a second-line medication because it offers a better safety profile, requires less monitoring, and has fewer drug interactions.
- Although undiluted IV push levetiracetam is safe and effective in adults, there is limited evidence regarding its use in pediatrics

**OBJECTIVES**

- Assess the impact on time to administration of undiluted IV push levetiracetam as compared to diluted IVPB levetiracetam in patients actively in SE.
- Further, how does undiluted IV push levetiracetam impact number of patients intubated, length of hospital stay, ICU admission, and hemodynamic disturbances.
- Evaluate pediatric ED patients in a sub-analysis

**METHODS**

- Pre-post quasi-experimental study through a retrospective chart review of patients admitted to Saint Francis Medical Center Children’s Hospital of Illinois

• **Diluted Levetiracetam group:** 01/01/21 to 06/30/22

• **Undiluted Levetiracetam group:** 01/01/23 to 06/30/24

**Inclusion Criteria**

- Under the age of 14
- Experiencing status epilepticus
- Treated with diluted levetiracetam 01/01/21 to 06/30/22
- Treated with undiluted levetiracetam 01/01/23 to 06/30/24

**Exclusion Criteria**

- 14 years and older
- Transferred from another hospital
- Not experiencing status epilepticus
- Treated with undiluted levetiracetam 01/01/21 to 06/30/22
- Treated with diluted levetiracetam 01/01/23 to 06/30/24

**RESULTS**

Primary Outcome	Diluted	Undiluted	p - value
Time from order to administration (minutes)	46 [30, 93]	33.5 [15, 70]	0.001
Secondary Outcomes	Diluted	Undiluted	p – value
Admitted to the ICU (Yes)	42 (40%)	46 (36.5%)	0.683
Hospital LOS (Days)	2.19 [1.13, 6.94]	2.22 [0.93, 7.25]	0.693
Ventilation (Yes)	21 (20%)	28 (22.2%)	0.803
Ventilation (Days)	8 [8, 19]	5.50 [2.75, 11.2]	0.808
ED Sub-analysis	Diluted	Undiluted	p – value
Time from order to administration (minutes)	43.5 [28.2, 87.8]	31.5 [15, 70]	0.003
Admitted to the ICU (Yes)	26 (30.2%)	33 (30.6%)	1.000
Hospital LOS (Days)	1.98 [1.02, 4.03]	1.92 [0.84, 4]	0.843
Ventilation (Yes)	11 (12.8%)	17 (15.7%)	0.708
Ventilation (Days)	6 [2.50, 12]	3 [2, 6]	0.243
Safety Outcomes	95% CI	p - value	
Systolic Blood Pressure	-0.71 (-4.39, 2.97)	0.7037	
Diastolic Blood Pressure	-0.25 (-4.1, 3.59)	0.8965	
Heart Rate	0.55 (-4.19, 5.3)	0.8180	
Oxygen Saturation	0.61 (-0.18, 1.4)	0.1312	

**DISCUSSION**

**Strengths**

- ED sub-group analysis
- Sample size comparable to other pediatric studies completed
- Evaluated safety and efficacy endpoints
- Appropriate education window between the transition periods

**Limitations**

- Retrospective and single center
- Did not capture the duration of the seizures or the number of recurrent seizures after levetiracetam administration

**CONCLUSION**

- The findings of this study indicate that the administration of undiluted levetiracetam via rapid IV push significantly enhances the efficiency of seizure management in pediatric patients without increasing the risk of adverse clinical outcomes.
- The reduction in median administration time shows the clinical advantage of this practice in emergency settings where time-sensitive interventions are crucial.
- The study contributes to the evolving clinical practice of seizure management in pediatric patients and supports the feasibility and safety of rapid IV push administration of undiluted levetiracetam.

**REFERENCES**

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