DOI: https://doi.org/10.54393/pjhs.v7i3.3586

PAKISTAN JOURNAL OF HEALTH SCIENCES
(LAHORE)
https://thejas.com.pk/index.php/pjhs
ISSN (E): 2790-9352, (P): 2790-9344
Volume 7, Issue 03 (March 2026)

Original Article

OPEN ACCESS

Safety and Efficacy of Intravenous Brivaracetam versus Levetiracetam in the Management of Status Epilepticus in Children

Ikram Ur Rahman[1*], Muhammad Zubair Ahmad[2] and Ali Tariq[1]

[1]Department of Pediatric Neurology, The Children's Hospital, Institute of Child Health, Multan, Pakistan
[2]Department of Pediatric Medicine, The Children's Hospital, Institute of Child Health, Multan, Pakistan

ARTICLE INFO

Keywords:
Levetiracetam, Mortality, Safety, Seizures, Status Epilepticus

How to Cite:
Rahman, I. U., Ahmad, M. Z., & Tariq, A. (2026). Safety and Efficacy of Intravenous Brivaracetam versus Levetiracetam in the Management of Status Epilepticus in Children: Intravenous Brivaracetam versus Levetiracetam in the Management of Status Epilepticus . Pakistan Journal of Health Sciences, 7(3), 63-68. https://doi.org/10.54393/pjhs.v7i3.3586

Corresponding Author:
Ikram Ur Rahman
Department of Pediatric Neurology, The Children's Hospital, Institute of Child Health, Multan, Pakistan
ikramsafi7@gmail.com

Received Date: 4th November, 2025
Revised Date: 29th January, 2026
Acceptance Date: 2nd February, 2026
Published Date: 31st March, 2026

ABSTRACT

Status epilepticus (SE) is one of the most common pediatric neurological emergencies and a major cause of all pediatric epilepsy-related hospital admissions. **Objectives:** To compare the safety and efficacy of intravenous (IV) brivaracetam versus levetiracetam in the management of SE in children. **Methods:** This randomized controlled trial was performed at the Department of Pediatric Neurology, Institute of Child Health, Multan, Pakistan, from January to September 2025. A total of 152 children (76 in each group), aged 1 month to 16 years with SE, were randomly assigned to receive IV brivaracetam (2 mg/kg) or levetiracetam (40 mg/kg). Seizure cessation within 30 minutes of infusion, time to cessation, recurrence, hospitalization duration, and adverse events were documented. Data were analyzed using SPSS v26.0, with $p<0.05$ considered significant. **Results:** In a total of 152 children, the median age was 6.2 years (IQR 3.4–10.7), and 84 (55.3%) children were males. Seizure cessation within 30 minutes was noted in 65 (85.5%) children receiving brivaracetam and 55 (72.4%) receiving levetiracetam (p=0.047). The median time to cessation was 4.5 (IQR 3.0–7.0) minutes in bivarectam, vs. 6.0 (IQR 4.0–9.5) minutes with levetiracetam (p=0.009). The median hospital stay was 4.0 (IQR 3.0–6.0) days vs 5.5 (IQR 4.5–7.0) days (p=0.034) in brivarecetam and levetiracetam groups, respectively. Adverse events occurred in 10 (13.2%) children in the Bivaracetam group vs. 14 (18.4%) with levetiracetam (p=0.374), while no mortality was documented. **Conclusions:** IV brivaracetam achieves faster and more effective seizure cessation compared with levetiracetam in children with SE, with lower rates of adverse effects.

INTRODUCTION

Status epilepticus (SE) is one of the most common pediatric neurological emergencies, with an estimated incidence of 10-27 per 100,000 children per year, and accounts for nearly 20% of all pediatric epilepsy-related hospital admissions [1-4]. The longer the seizure persists, the greater the risk of neuronal injury, systemic complications, and poor neurodevelopmental outcomes [5]. Early and effective intervention is therefore crucial to reduce morbidity and mortality. First-line treatment typically consists of benzodiazepines; however, up to 30-40% of patients develop benzodiazepine refractory SE (RSE), necessitating the use of second-line antiseizure medications (ASMs) [6,7]. Traditionally, phenytoin, valproate, and phenobarbital have been used, but their variable efficacy, narrow therapeutic index, and risk of cardiopulmonary or hepatic adverse effects limit their utility in the acute pediatric setting [8]. In recent years, newer ASMs like levetiracetam and brivaracetam have emerged as promising alternatives owing to their favorable pharmacokinetic profiles, safety, and intravenous (IV) formulations [9]. Levetiracetam, an SV2A ligand, is one of the most commonly employed 2nd-line agents in SE. IV levetiracetam offers good efficacy and tolerability, a fast onset of action, and minimal drug-drug interactions, making it especially suitable for critically ill children [10]. Documented response rates of levetiracetam in seizure

DOI: https://doi.org/10.54393/pjhs.v7i3.3586

cessation rates vary between 40-70% [11]. Relatively higher affinity of brivaracetam is expected to result in more potent and quicker seizure cessation rates [12, 13].

Although IV brivaracetam is increasingly being studied in adult SE populations, evidence in pediatric patients remains sparse, with only limited case series and observational studies reporting favorable outcomes. There is a pressing need for safe and effective options in pediatric SE. There is also a lack of head-to-head data comparing IV brivaracetam with levetiracetam, particularly in children. The findings of this study may guide safe and effective options in managing paediatric SE. This study aims to compare the safety and efficacy of IV brivaracetam versus levetiracetam in the management of SE in children.

METHODS

This randomized controlled trial (NCT07163572 at https://clinicaltrials.gov/study/NCT07163572) was conducted at the Department of Pediatric Neurology, The Children's Hospital, Multan, Pakistan, from January 2025 to September 2025, following approval from the Institutional Review Board (letter: 2361). A sample size of 152 (76 in each group) was calculated using the Open Epi online sample size calculator. Because no head-to-head pediatric randomized trial comparing IV brivaracetam and levetiracetam in convulsive status epilepticus was available to inform the expected effect size, the study conducted a pilot study in 40 children (20 per group) to estimate event rates for the primary endpoint (seizure cessation within 30 minutes of study drug administration). In the pilot, seizure cessation within 30 minutes occurred in 16 (80.0%) of children receiving brivaracetam versus 13 (65.0%) receiving levetiracetam, indicating an absolute difference of 15%. Using Open Epi for comparison of two independent proportions with two-sided α=0.05 and 80% power, the required sample size was 152 children (76 per group). Written informed consent was obtained from parents or legal guardians before enrollment. The inclusion criteria were children aged one month to 16 years, presenting with SE. The exclusion criteria were children who had already received IV antiseizure medication for the current episode before presentation, had known hypersensitivity to study drugs, or were hemodynamically unstable, requiring inotropic support before administration. SE was defined as continuous seizure activity lasting > 5 minutes or recurrent seizures without recovery of consciousness. The study adhered to CONSORT 2010 guidelines (Figure 1).

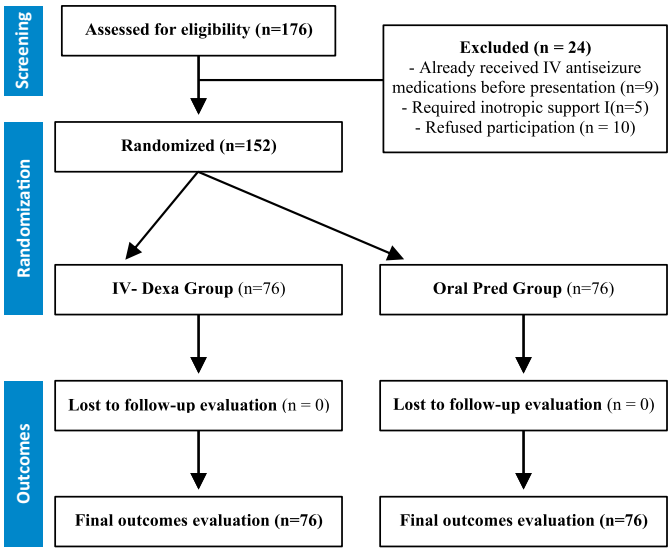

Figure 1: CONSORT Flow Diagram

Baseline demographic data on gender, age, weight, and clinical variables like seizure duration before drug administration were recorded. Baseline demographic and clinical characteristics were recorded at enrollment, prior to study drug administration, using caregiver interviews, standardized clinical assessments, and review of emergency/medical records. Data for the etiology of status epilepticus were obtained from patients' records. Participants were randomized in a 1:1 ratio to receive either IV brivaracetam or IV levetiracetam. A computer-generated randomization sequence was used. To maintain allocation concealment, allocations were enclosed in sequentially numbered, opaque, sealed envelopes. The treating team and outcome assessors were blinded to the drug allocation since the drugs were prepared and labeled by a pharmacist who did not participate in the care of the subjects. Patients in the brivaracetam group received a loading dose of 2 mg/kg (maximum 100 mg) diluted in 100 ml of normal saline infused over a period of 10 minutes, while the patients in the levetiracetam group received a loading dose of 40 mg/kg (maximum 3000 mg) similarly diluted and infused. All patients were continuously monitored during infusion and for 30 minutes after infusion for any acute adverse effects. Efficacy was the primary outcome, which was labelled as the cessation of clinical seizures within 20-30 minutes of infusion without the need for additional antiseizure medication. Secondary outcomes included time to seizure cessation, recurrence of seizures (within 24 hrs, 72 hrs, or 7 days), need for additional antiseizure medication, duration of stay in hospital or intensive care in days, and in-hospital mortality (yes/no). Safety was assessed in terms of recording drug-related adverse events like hypersensitivity reactions, cardiovascular instability, respiratory depression, gastrointestinal intolerance, and CNS depression, which were actively

DOI: https://doi.org/10.54393/pjhs.v7i3.3586

looked for.

Statistical analysis was performed using "IBM-SPSS Statistics" version 26.0. For the continuous variables, means and standard deviations (SD) or medians and interquartile ranges (IQR) were computed, depending on the data's normal distribution. Comparison between the two groups was done using the student's t-test or the Mann–Whitney U test, as appropriate. Categorical variables were compared using chi-square or Fisher's exact test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Among 152 children, the overall median age was 6.2 years (IQR 3.4–10.7), and 84 children (55.3%) were male. In terms of identified etiologies, febrile seizures were noted in 43 (28.3%), idiopathic epilepsy in 40 (26.3%), central nervous system infection in 34 (22.4%), post-hypoxic events in 22 (14.5%), and metabolic or structural causes in 13 (8.6%) cases. The median seizure duration before study drug administration was 24 minutes (IQR 18–31) (Table 1).

Table 1: Comparison of Baseline Demographic and Clinical Characteristics Between Study Groups (n=152)

Characteristics		Bivaracetam (n=76)	Levetiracetam (n=76)	p-value
Gender	Male	43 (56.6%)	41 (53.9%)	0.744*
	Female	33 (43.4%)	35 (46.1%)	
Age in Years	Median (IQR)	6.0 (3.5-10.5)	6.3 (3.3-10.9)	0.715^
Weight in kg	Median (IQR)	21.0 (15.4-28.2)	22.6 (15.5-29.5)	0.603^
Etiology of Status Epilepticus	Febrile Seizures	20 (26.3%)	23 (30.3%)	0.953*
	Idiopathic Epilepsy	19 (25.0%)	21 (27.6%)	
	Central Nervous System Infection	18 (23.7%)	16 (21.1%)	
	Post-Hypoxic	12 (15.8%)	10 (13.2%)	
	Metabolic/Structural	7 (9.2%)	6 (7.9%)	
Seizure Duration Before Drug in Minutes	Median (IQR)	24.0 (15.5-30.0)	25.0 (19.0-32.5)	0.528^

*Chi-square test applied; ^Mann-U Whitney test applied

Clinical seizure cessation within 30 minutes of infusion was achieved in 65 (85.5%) children in the brivaracetam group, and 55 (72.4%) children in the levetiracetam group (p=0.047). The median time to cessation was significantly shorter in patients receiving brivaracetam, recorded at 4.5 minutes (IQR 3.0–7.0), compared with 6.0 minutes (IQR 4.0–9.5) with levetiracetam (p=0.009). No patient required discontinuation of infusion due to acute intolerance or hemodynamic instability. Seizure recurrence within 24 hours occurred in 8 (10.5%) cases in the brivaracetam group, and 13 (17.1%) in the levetiracetam group (p=0.240). Recurrence within 72 hours was observed in 11 (14.5%) and 17 (22.4%) children, respectively (p=0.209), and within 7 days in 13 (17.1%) and 20 (26.3%) children, respectively (p=0.168). The requirement for a rescue anti-epileptic drug was recorded in 9 (11.8%) cases receiving brivaracetam, and in 18 (23.7%) receiving levetiracetam (p=0.056). No mortality was reported during the study period. The median duration of hospitalization was 4.0 days (IQR 3.0–6.0) in patients treated with brivaracetam and 5.5 days (IQR 4.5–7.0) in those treated with levetiracetam (p=0.034) (Table 2).

Table 2: Comparison of Treatment Outcomes Between Study Groups

Characteristics		Bivaracetam (n=76)	Levetiracetam (n=76)	p-value
Seizure Cessation	< 30 Minutes	65 (85.5%)	55 (72.4%)	0.047
Time to Cessation in Minutes	Media (IQR)	4.5 (3.0-7.0)	6.0 (4.0-9.5)	0.009
Seizure Recurrence	Within 24 Hours	8 (10.5%)	13 (17.1%)	0.240
	Within 72 Hours	11 (14.5%)	17 (22.4%)	0.209
	Within 7 Days	13 (17.1%)	20 (26.3%)	0.168
Need for Rescue Anti-Epileptic Drug	–	9 (11.8%)	18 (23.7%)	0.056
Intensive Care Unit Admission	–	28 (36.8%)	33 (43.4%)	0.385
Duration of Hospitalization in Days	Media (IQR)	4.0 (3.0-6.0)	5.5 (4.5-7.0)	0.034

With respect to safety outcomes, 10 (13.2%) cases in the brivaracetam group, and 14 (18.4%) in the levetiracetam group experienced adverse events (p=0.374). The most frequent adverse event was somnolence, observed in 5 (6.6%) cases in the Bivaracetam group, and 7 (9.2%) cases with Levetiracetam (p=0.547). Vomiting was noted among 3 (3.9%) children in Bivaracetam, and 4 (5.3%) children's patients respectively (p=0.699). Mild hypotension was reported in 2 (2.6%) children receiving brivaracetam, and in 3 (3.9%) with Levetiracetam (p=0.649). No serious adverse events or life-threatening complications were documented in either treatment group. None of the children in either group developed rash, hypersensitivity, or respiratory depression during or after infusion (Table 3).

Table 3: Comparison of Adverse Events Observed within 30 Minutes Following Bivaracetam and Levetiracetam Infusion

Characteristics	Bivaracetam (n=76)	Levetiracetam (n=76)	p-value
Somnolence	5 (6.6%)	7 (9.2%)	0.547
Vomiting	3 (3.9%)	4 (5.3%)	0.699
Mild Hypotension	2 (2.6%)	3 (3.9%)	0.649
Behavioral Agitation	–	2 (2.6%)	0.155
Overall Adverse Events	10 (13.2%)	14 (18.4%)	0.374

DISCUSSION

The rate of seizure cessation within 30 minutes was significantly higher in the brivaracetam group at 85.5% compared with 72.4% with levetiracetam. Contemporary literature describing brivaracetam's pharmacological properties highlights it to have a more rapid blood–brain

DOI: https://doi.org/10.54393/pjhs.v7i3.3586

barrier penetration and greater receptor selectivity compared with levetiracetam, explaining its more potent antiepileptic effect in both clinical and experimental models [14, 15]. The median time to seizure cessation in this trial was 4.5 minutes in the brivaracetam group and 6.0 minutes in the levetiracetam group. Although seizure control was achieved within a clinically acceptable timeframe with both agents, this difference has important therapeutic implications, given that longer seizure duration is directly associated with neuronal injury and poorer outcomes in children. A recent meta-analysis of levetiracetam compared with other antiseizure medications reported that levetiracetam shortened the time to seizure cessation in comparison to phenytoin or fosphenytoin, but that the duration remained longer than the values observed for brivaracetam in the present study [16]. This difference indicates that brivaracetam may have a specific pharmacological advantage in terms of limiting seizure exposure time, a factor highly relevant to preventing refractory progression and intensive care requirements. Recurrence rates were consistently lower in the brivaracetam group in all time intervals measured; however, the difference did not reach statistical significance. These findings are supported by the systematic review performed by Moalong *et al.* in which 48% of patients with SE responded to IV brivaracetam, but recurrence intervals were variable depending on etiology and disease chronicity [12]. Orlandi *et al.* from Italy, documented a seizure freedom rate of 58% within 24 hours after the administration of brivaracetam, in comparison to conventional agents, and reported lower risks of evolution to SE [17]. The recurrence pattern seen in the present study reinforces the possibility that early seizure termination could provide extended postictal stabilization, even if the data did not show a full statistical difference. The need for rescue antiseizure medication was almost twice as frequent among children treated with levetiracetam (23.7%) compared with those treated with brivaracetam (11.8%). This finding mirrors the observations of Martellino *et al.* who reported that IV brivaracetam achieved sustained seizure control in over half of the treated patients within 24 hours, reducing the need for additional agents [18]. Besli *et al.* also demonstrated that levetiracetam required fewer secondary interventions compared with phenytoin, suggesting a favorable efficacy gradient among newer antiseizure drugs [19]. The duration of hospitalization in this study was significantly shorter among children receiving brivaracetam, with a median stay of four days compared with 5.5 days in the levetiracetam group. The link between faster seizure control and shorter hospitalization is a reasonable interpretation, but not a statistically proven causal pathway. In the meta-analysis by Alsabri *et al.* levetiracetam was found to reduce ICU stay compared with phenytoin, indicating that agents with a better safety margin and shorter seizure resolution time facilitate quicker recovery [16]. Regarding safety, adverse events were uncommon, and their rate was similar in the two treatment groups. During the double-blind period, adverse effects occurred in 13.2% of children assigned to brivaracetam and in 18.4% of those assigned to levetiracetam; this difference is not statistically significant. The most common adverse event was somnolence, observed in 6.6% and 9.2% of children in the respective groups. Vomiting and mild hypotension were infrequent and self-limiting. No serious hypersensitivity reactions, respiratory depression, or hemodynamic instability occurred. Song *et al.* reported that treatment-emergent adverse events occurred in 39% of pediatric patients receiving brivaracetam, with somnolence being the most frequent and behavioral symptoms being less common than with levetiracetam [20]. Sivadasan *et al.* reported that behavioral adverse effects were more prominent with levetiracetam [21]. The present trial reinforces the view that both agents possess favorable safety profiles, but that brivaracetam may offer improved behavioral tolerability in prolonged therapy or recurrent seizure scenarios. Both brivaracetam and levetiracetam act on the SV2A receptor; however, brivaracetam has a 10-30-fold higher affinity and a more rapid receptor occupancy rate, resulting in faster antiepileptic activity with fewer off-target effects [15, 22]. Steinhoff and Sttack highlighted that brivaracetam's selective SV2A binding minimizes psychiatric and behavioral complications, whereas levetiracetam has been associated with irritability and agitation in a subset of pediatric patients [9]. Evidence regarding the use of brivaracetam in pediatric SE remains limited. Most published literature has focused on adult or mixed populations with either refractory epilepsy or SE. This makes the trial unique due to the paucity of pediatric data and provides direct, comparative evidence of brivaracetam versus levetiracetam in a controlled pediatric cohort. The findings extend our current understanding of seizure management in children and suggest that early use of brivaracetam may enhance seizure control without compromising safety [23, 24].

Several limitations are recognized. The trial was performed at a single tertiary care center. The follow-up period was confined to the duration of acute hospitalization, restricting assessment of long-term outcomes such as seizure recurrence, cognitive development, and behavioral effects. Relatively modest sample size may have underpowered the actual differences in effect sizes in the provided statistics, so further studies with larges sample size should be conducted to verify these findings. To

DOI: https://doi.org/10.54393/pjhs.v7i3.3586

confirm long-term effectiveness and safety, future research should focus on large-scale, multicenter trials that employ long follow-ups. Besides, cost-effectiveness studies and studies on optimal dosing of specific groups of children are required to inform the practice. Evidence-based treatment guidelines must be updated using these findings.

CONCLUSIONS

IV brivaracetam achieves faster and more effective seizure cessation compared with levetiracetam in children with SE, without increasing adverse effects. The results support brivaracetam as a promising therapeutic alternative where rapid seizure control is essential.

Authors' Contribution

Conceptualization: MZA
Methodology: IUR, MZA, AT
Formal analysis: IUR
Writing and Drafting: IUR
Review and Editing: IUR, MZA, AT

All authors approved the final manuscript and take responsibility for the integrity of the work.

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

REFERENCES

[1] Wylie T, Sandhu DS, Murr NI. Status Epilepticus. Last Update: 2023 May. Stat Pearls [Internet]. 2025.

[2] Xu MY. Poststroke Seizure: Optimizing Its Management. Stroke and Vascular Neurology. 2019 Mar; 4(1). doi: 10.1136/svn-2018-000175.

[3] Toker RT, Bodur M, Okan MS. Etiologies of Convulsive Status Epilepticus in Children. The Journal of Current Pediatrics. 2023; 21: 195-201. doi: 10.4274/jcp.2023.74508.

[4] Rosati A, Bartolotta P, Marini C, Mondardini MC, Cordelli DM, Fetta A *et al.* Optimizing Pediatric Status Epilepticus Management: The Role of Early Midazolam Infusion and Adherence to Clinical Practice Guidelines. Epilepsia. 2025 May; 66(9): 3193-3206. doi: 10.1111/epi.18455.

[5] Lugli L, Bariola MC, Guidotti I, Pugliese M, Roversi MF, Bedetti L *et al.* Neurodevelopmental Outcome of Neonatal Seizures: A Longitudinal Study. European Journal of Pediatric Neurology. 2024 Mar; 49: 17-26. doi: 10.1016/j.ejpn.2024.01.007.

[6] Mayer SA, Claassen J, Lokin J, Mendelsohn F, Dennis LJ, Fitzsimmons BF. Refractory Status Epilepticus: Frequency, Risk Factors, and Impact on Outcome. Archives of Neurology. 2002 Feb; 59(2): 205-10. doi: 10.1001/archneur.59.2.205.

[7] Haddad N, Melikyan G, Hail HA, Khodair RH, Thekkumpurath T, Alrabi A. Advances in the Treatment of Status Epilepticus. Status Epilepticus - Recent Advances in Epidemiology, Electroencephalography, Etiology, Diagnosis, and Treatment in Adults and Children. 2023 Oct. doi: 10.5772/intechopen.106022.

[8] Jamali A, Ali W, Rehman FU. Comparison of Phenobarbital and Sodium Valproate for the Treatment of Status Epilepticus in Children. The Professional Medical Journal. 2020 Jul; 27(07): 1353-7. doi: 10.29309/TPMJ/2020.27.07.3543.

[9] Steinhoff BJ and Staack AM. Levetiracetam and Brivaracetam: A Review of Evidence from Clinical Trials and Clinical Experience. Therapeutic Advances in Neurological Disorders. 2019 Sep; 12: 17562864198 73518. doi: 10.1177/1756286419873518.

[10] Kartek M, Kannan A, Anand V, Sahoo MR. Intravenous Levetiracetam Versus Intravenous Phenytoin as Second-Line Treatment in Pediatric Convulsive Status Epilepticus-Open-Label Randomized Controlled Trial. Journal of Family Medicine and Primary Care. 2024 Aug; 13(8): 3368-73. doi: 10.4103/jfmpc.jfmpc_1747_23.

[11] Appleton RE, Rainford NE, Gamble C, Messahel S, Humphreys A, Hickey H *et al.* Levetiracetam as an Alternative to Phenytoin for Second-Line Emergency Treatment of Children with Convulsive Status Epilepticus: The Eclipse Rct. Health Technology Assessment (Winchester, England). 2020 Nov; 24(58): 1. doi: 10.3310/hta24580.

[12] Moalong KM, Espiritu AI, Fernandez ML. Efficacy and Tolerability of Intravenous Brivaracetam for Status Epilepticus: A Systematic Review. Journal of the Neurological Sciences. 2020 Jun; 413: 116799. doi: 10.1016/j.jns.2020.116799.

[13] McGuire S, Silva G, Lal D, Khurana DS, Legido A, Hasbani D *et al.* Safety and Efficacy of Brivaracetam in Pediatric Refractory Epilepsy: A Single-Center Clinical Experience. Journal of Child Neurology. 2020 Feb; 35(2): 102-5. doi: 10.1177/0883073819879276.

[14] Hwang H and Kim WJ. Brivaracetam: Pharmacology, Clinical Efficacy, and Safety in Epilepsy. Journal of Epilepsy Research. 2025 Jun; 15(1): 42. doi: 10.14581/jer.25005.

[15] Klein P and Bourikas D. Narrative Review of Brivaracetam: Preclinical Profile and Clinical Benefits in the Treatment of Patients with Epilepsy.

DOI: https://doi.org/10.54393/pjhs.v7i3.3586

Advances in Therapy. 2024 Jul; 41(7): 2682-99. doi: 10.1007/s12325-024-02876-z.

[16] Alsabri M, Elsayed SM, Rath S, Abdul-Hafez HA, Abo-Elnour DE, Kurian E. Efficacy and Safety of Levetiracetam for Pediatric Convulsive Status Epilepticus in Emergency Settings: A Systematic Review and Meta-Analysis. BioMed Central Neurology. 2025 Jul; 25(1): 309. doi: 10.1186/s12883-025-04323-0.

[17] Orlandi N, d'Orsi G, Pauletto G, Nilo A, Sicurella L, Pescini F *et al.* A Retrospective Multicentric Study on the Effectiveness of Intravenous Brivaracetam in Seizure Clusters: Data from the Italian Experience. Seizure: European Journal of Epilepsy. 2023 May; 108: 72-80. doi: 10.1016/j.seizure.2023.04.015.

[18] Martellino C, Laganà A, Atanasio G, Lamanna F, Attardo S, Cascino S *et al*. The Real-World Effectiveness of Intravenous Brivaracetam as a Second-Line Treatment in Status Epilepticus. Epilepsy and Behavior. 2023 Nov; 148: 109464. doi: 10.1016/j.yebeh.2023.109464.

[19] Besli GE, Karatoprak EY, Yilmaz S. Efficacy and Safety Profile of Intravenous Levetiracetam Versus Phenytoin in Convulsive Status Epilepticus and Acute Repetitive Seizures in Children. Epilepsy and Behavior. 2020 Oct; 111: 107289. doi: 10.1016/j.yebeh.2020.107289.

[20] Song T, Feng L, Xia Y, Pang M, Geng J, Zhang X *et al.* Safety and Efficacy of Brivaracetam in Children Epilepsy: A Systematic Review and Meta-Analysis. Frontiers in Neurology. 2023 Jul; 14: 1170780. doi: 10.3389/fneur.2023.1170780.

[21] Sivadasan S, Raj FB, John K, Murugan S, Sam SS, Elumalai SK. Effectiveness and Safety of Brivaracetam in Comparison with Levetiracetam in Seizures. Acta Epileptologica. 2025 Dec; 7(1): 47. doi: 10.1186/s42494-025-00229-z.

[22] Gillard M, Fuks B, Leclercq K, Matagne A. Binding Characteristics of Brivaracetam, A Selective, High Affinity SV2A Ligand in Rat, Mouse and Human Brain: Relationship to Anti-Convulsant Properties. European Journal of Pharmacology. 2011 Aug; 664(1-3): 36-44. doi: 10.1016/j.ejphar.2011.04.064.

[23] Lattanzi S, Chiesa V, Di Gennaro G, Ferlazzo E, Labate A, La Neve A *et al.* Brivaracetam Use in Clinical Practice: A Delphi Consensus on Its Role as First Add-on Therapy in Focal Epilepsy and Beyond. Neurological Sciences. 2024 Sep; 45(9): 4519-27. doi: 10.1007/s10072-024-07485-w.

[24] Villanueva V, Rodriguez-Osorio X, Juiz-Fernández Á, Sayas D, Hampel K, Castillo A *et al.* Real-Life Evidence About the Use of Intravenous Brivaracetam in Urgent Seizures: The BRIV-IV Study. Epilepsy and Behavior. 2023 Oct; 147: 109384. doi: 10.1016/j.yebeh.2023.109384.