RESEARCH PAPER

Effectiveness, Tolerability, and Safety of Levetiracetam vs Oxcarbazepine in Newly Diagnosed Focal Epilepsy: A Longitudinal Study

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ABSTRACT

Background:
Focal epilepsy is one of the most common forms of epilepsy in adults and requires long-term antiseizure medication therapy to achieve sustained seizure control while minimizing adverse effects and preserving quality of life. Levetiracetam (LEV) and oxcarbazepine (OXC) are commonly used as monotherapy for newly diagnosed focal epilepsy, but differences in long-term effectiveness, tolerability, safety, and patient-reported quality of life remain clinically relevant.

Objective:
To compare the effectiveness, tolerability, safety, and treatment retention of levetiracetam and oxcarbazepine monotherapy in adults with newly diagnosed focal-onset epilepsy over 12 months.

Methods:
This prospective, observational, longitudinal study was conducted in the Neurology outpatient department of Veer Surendra Sai Institute of Medical Sciences and Research (VIMSAR), Burla, Sambalpur, Odisha, India, from June 2023 to March 2025. A total of 160 patients aged >16 years with newly diagnosed focal epilepsy were enrolled by consecutive sampling and allocated into two treatment groups: LEV (n=80) and OXC (n=80), according to the treating neurologist's prescription. Patients were followed at 3, 6, and 12 months. Effectiveness was assessed by seizure-freedom and responder rates, with a responder defined as >50% reduction in seizure frequency from baseline. Tolerability was assessed using the Quality of Life in Epilepsy-31 (QOLIE-31) questionnaire. Safety was evaluated through adverse-drug-reaction reporting and treatment discontinuation. Data were analyzed using SPSS version 26, with appropriate t-tests, chi-square/Fisher's exact tests, and non-parametric tests. A p-value <0.05 was considered statistically significant.

Results:
The median age was 36 years in the LEV group and 34 years in the OXC group. The median baseline seizure frequency was 3 seizures (IQR 2–4) in both groups. At 3 months, seizure freedom was achieved by 79.2% of LEV-treated patients compared with 63.6% receiving OXC (p=0.005). At 6 months, seizure-free rates were 79.73% and 57.53%, respectively (p=0.001), while the median seizure frequency was also lower with LEV. At 12 months, seizure freedom was observed in 71.01% of the LEV group and 58.20% of the OXC group; the

thesis reports conflicting statistical tests for this comparison and therefore the difference should be interpreted cautiously. Treatment withdrawal due to adverse events occurred in 8.75% of LEV-treated patients and 10.0% of OXC-treated patients ($p>0.05$). Somnolence was reported in 3.75% of both groups, while dizziness and excitement were reported with LEV; vomiting, rash, and dizziness were reported with OXC. QOLIE-31 scores improved progressively in both groups over 12 months, with LEV showing favorable scores across several domains.

Conclusion:
Both levetiracetam and oxcarbazepine were effective and generally well tolerated as monotherapy for newly diagnosed focal epilepsy. LEV demonstrated higher observed seizure-free rates at 3 and 6 months and favorable long-term quality-of-life trends, while overall treatment-related discontinuation because of adverse events was comparable between groups. Larger multicenter studies with standardized statistical analyses and longer follow-up are required to establish comparative long-term superiority.

Keywords: Focal epilepsy; levetiracetam; oxcarbazepine; monotherapy; seizure freedom; antiseizure medication; QOLIE-31; adverse drug reactions; tolerability; safety

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Introduction

A chronic neurological condition with significant medical, psychological, social, and economic repercussions, epilepsy is defined by a propensity for repeated epileptic convulsions. The most prevalent type of epilepsy in adults is focal-onset epilepsy, which is caused by aberrant electrical activity that starts in a specific area of the cerebral cortex. Even though seizure control has improved due to advancements in diagnosis and treatment, many patients still need long-term or lifelong antiseizure drug (ASM) therapy. Sustained seizure independence with little side effects while preserving functional status and quality of life is the major goal of treatment. Because ASM monotherapy can effectively control seizures while reducing medication interactions, pill burden, and cumulative toxicity, it is typically recommended for individuals with recently diagnosed focal epilepsy. Seizure characteristics, comorbidities, age, concurrent drugs, reproductive concerns, adverse-effect profile, cost, and patient desire all play a role in choosing the best initial ASM. Comparative analysis of frequently given ASMs is therefore still clinically significant (1, 2).

Focal seizures can be effectively treated with oxcarbazepine (OXC), a structural variant of carbamazepine. Its main method is to reduce neuronal hyperexcitability by modulating voltage-gated sodium channels. Although OXC works well for focal epilepsy, it may cause somnolence, gastrointestinal issues, skin responses, dizziness, and clinically significant hyponatremia. On the other hand, levetiracetam (LEV) has a unique mechanism that involves modulating neurotransmitter release and binding to synaptic vesicle protein 2A (SV2A). Its extensive use has been facilitated by its pharmacokinetic profile, comparatively low risk of medication interactions, and lack of hepatic enzyme stimulation. The relative effectiveness of LEV and OXC has been the subject of conflicting findings in earlier comparative research. According to a Chinese multicenter randomized study, both medications enhanced anxiety and quality of life, although OXC had greater seizure-free rates at 12 and 24 weeks (3, 4).

On the other hand, long-term randomized data from Korea showed that LEV had lower treatment-failure rates over about a year and was not inferior than OXC. The uncertainty regarding comparative long-term effectiveness was highlighted by a comprehensive review and meta-analysis that found no significant difference in seizure freedom or withdrawal owing to side events between the two medications. Crucially, therapeutic success is not entirely determined by effectiveness alone. Important elements of long-term epilepsy management include adverse events, drug cessation, patient adherence, mental health, cognition, social functioning, and general quality of life. In order to examine the efficacy, safety, tolerability, and quality of life of persons with

newly diagnosed focal epilepsy who were receiving either LEV or OXC monotherapy and were monitored over a 12-month period, the current study was conducted (5).

Methods

Study design and setting

This was a prospective, observational, longitudinal comparative study conducted in the Neurology outpatient department, with involvement of the Department of Pharmacology, at Veer Surendra Sai Institute of Medical Sciences and Research (VIMSAR), Burla, Sambalpur, Odisha, India. The study period was from June 2023 to March 2025. The study population comprised adults with newly diagnosed focal-onset epilepsy.

Study population

A total of **160 patients** were enrolled and divided equally into two treatment groups:

- **Group A:** Oxcarbazepine (OXC), n=80
- **Group B:** Levetiracetam (LEV), n=80

The sample size was calculated with reference to the study by Zhu et al., using previously reported seizure-free proportions for OXC and LEV. An initial sample size of 140 was estimated, which was increased to 160 after allowing for an anticipated 10% dropout rate. Consecutive sampling was used for participant recruitment. Ethical approval was obtained vide approval number 168-2022/I-S-T/118/Dt. 22.05.2023.

Eligibility criteria

Inclusion criteria

Patients were eligible if they:

1. Were aged **>16 years**.
2. Had newly diagnosed focal epilepsy.
3. Had been prescribed either LEV or OXC monotherapy by the treating neurologist.
4. Had initiated the study medication within one month before enrolment.
5. Provided appropriate informed consent.

Exclusion criteria

Patients were excluded if they had alcohol abuse, status epilepticus within the preceding 3 months, progressive brain disease, demyelinating disease, brain tumor or degenerative disease, severe psychiatric or systemic illness, pregnancy or breastfeeding, contraindications to either study medication, or requirement for concomitant/add-on antiseizure therapy.

Treatment groups

Patients were followed according to the treating neurologist's prescription.

The OXC group received oral oxcarbazepine at doses ranging from 900–2400 mg/day, adjusted according to seizure control, tolerability, and adverse events.

The LEV group received oral levetiracetam at doses ranging from 1000–3000 mg/day, adjusted according to seizure frequency, tolerability, and adverse events.

Baseline assessment

At enrolment, a structured case-record form was used to document sociodemographic and clinical characteristics. Baseline assessment included personal and medical history, physical and neurological examination, seizure characteristics, medication history, and relevant investigations.

Baseline investigations included:

- Complete blood count
- Liver function tests
- Renal function tests
- Electroencephalography (EEG)
- Magnetic resonance imaging (MRI) or computed tomography (CT), as clinically indicated
- Height, weight and body mass index

Patients were instructed to maintain a daily record of seizure episodes and adverse effects and to report these during scheduled follow-up visits or earlier when clinically required.

Follow-up

Patients were assessed at:

- **Baseline**
- **3 months (12 weeks)**
- **6 months (24 weeks)**
- **12 months (48 weeks)**

At each follow-up, seizure frequency, seizure control, treatment adherence, adverse events, medication changes, and treatment discontinuation were documented.

Assessment of effectiveness

The primary effectiveness outcome was seizure freedom, defined as the proportion of patients who remained free from seizures during the specified follow-up period.

A secondary effectiveness outcome was the responder rate, defined as a reduction of >50% in seizure frequency from baseline. Patients with <50% reduction or worsening seizure frequency were categorized as non-responders. Effectiveness was evaluated at 3, 6 and 12 months.

Assessment of tolerability

Treatment tolerability was assessed using the Quality of Life in Epilepsy-31 (QOLIE-31) questionnaire. The questionnaire evaluates seven major domains:

1. Seizure worry
2. Emotional well-being
3. Energy/fatigue
4. Cognitive functioning
5. Medication effects
6. Social functioning
7. Overall quality of life

Higher scores represented better health-related quality of life. QOLIE-31 assessments were performed longitudinally during follow-up.

Assessment of safety

Safety was evaluated by documenting treatment-emergent adverse drug reactions, their characteristics, and their relationship to the study medication. The WHO–Uppsala Monitoring Centre (WHO-UMC) causality assessment system was used for evaluation of suspected adverse drug reactions. Treatment withdrawal due to adverse events was also recorded as a safety/tolerability outcome.

Statistical analysis

Data were analyzed using SPSS version 26. Continuous variables were expressed as mean ± standard deviation/standard error or median with interquartile range, according to distribution. Categorical variables were presented as frequencies and percentages. Independent-samples *t*-tests were used for comparison of normally distributed continuous variables, while chi-square or Fisher's exact tests were used for categorical variables. Non-parametric comparisons were performed using the Mann–Whitney U test when appropriate. Within-group longitudinal QOLIE-31 changes were evaluated using one-way ANOVA with Tukey's post-hoc test. A two-sided $p<0.05$ was considered statistically significant.

Results

Table 1: Demographic data of the epileptic patients

	LEVETIRACETAM GROUP (n=80)	**OXCARBAZEPINE GROUP** (n=80)
Age (years) Median (IQR)	36 (17 – 54)	34 (21 - 49)
Gender, n (%) Male Female	42 (52.5%) 38 (47.5%)	45 (56.25%) 35 (43.75%)
Weight (kg) Mean ± SD	61.02 ± 10.6	60.4 ± 9.73
Education	Uneducated=9(11.25%) Up to 12th =57(71.25%) Graduate= 14 (17.5%)	Uneducated=8 (10%) Up to 12th =59(73.75%) Graduate=13 (16.25%)
Occupation	Employed=37 (46.25%) Unemployed=43(53.75%)	Employed=31(38.75%) Unemployed=49(61.25%)
Marital Status	Married=68 (85%) Unmarried=12 (15%)	Married=61 (76.25%) Unmarried=19 (23.75%)
No. of seizures before treatment,	3 (2 – 4)	3 (2 – 4)

Baseline Median (IQR)		
MRI or CT report Abnormal Normal	31.2% 68.74%	29.8% 70.2%
EEG Abnormal Normal	77.6% 22.4%	68.2% 31.8%

Table 2: Effectiveness and safety of LEV and OXC group after 3 months, 6months and 1year treatment

	Levetiracetam group	**Oxcarbazepine group**
3 Months effectiveness of ASM(n)	77	77
Seizure free, n (%)	61(79.2%) **	49(63.6%)
Response but not got seizure free, n (%)	6(7.8%)	9(11.7%)
No response or worsening, n (%)	10(13%)	19(24.7%)
3 months no. of seizures per month Median (IQR)	1 (0.45 – 1.12)	1.25 (0.92 – 2.20) *

*Data expressed as Mean ± SEM, intergroup significance (Levetiracetam vs Oxcarbazepine) analysed by unpaired "t" test depicted as *(p<0.05), **(p<0.01), ***(p<0.001)*

	Levetiracetam group	**Oxcarbazepine group**
6 Months effectiveness of ASM(n)	74	73
Seizure free, n (%)	59 (79.73%) ***	42 (57.53%)
Response but not got seizure free, n (%)	13 (17.56%)	18 (24.65%)
No response or worsening, n (%)	2 (2.7%)	13 (17.8%)
6 months no. of seizures per month Median (IQR)	0.40 (0.31 – 0.93)	0.9 (0.56 – 1.52) *
1 year effectiveness of ASM(n)	69	67
Seizure free, n (%)	49 (71.01%) *	39 (58.20%)
Response but not got seizure free, n (%)	15 (21.73%)	19 (28.35%)
No response or worsening, n (%)	5 (7.24%)	9 (13.43%)

1-year no. of seizures per month Median (IQR)	0.31 (0.25 - 0.76)	0.8 (0.39 -1.05) **
No. of drop out study due to AEs, n (%)	7 (8.75%)	8 (10%)
Adverse events, n (%)	4 (5.8%)	5(7.46%)

*Data expressed as Mean ± SEM, intergroup significance (Levetiracetam vs Oxcarbazepine) analysed by unpaired "t" test depicted as *(p<0.05), **(p<0.01), ***(p<0.001)*

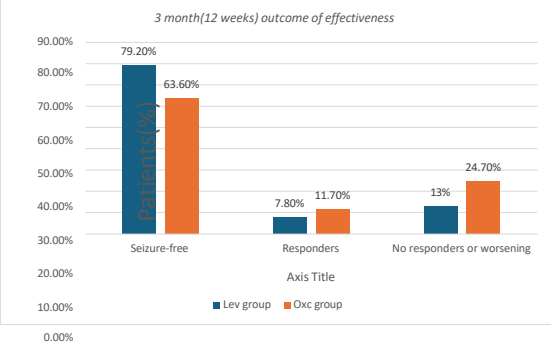


Figure 1: 3months effectiveness of levetiracetam Vs oxcarbazepine medications

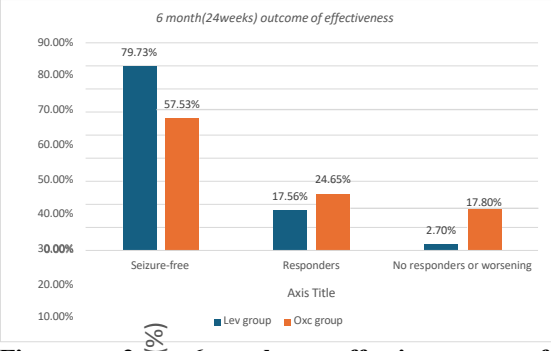


Figure 2: 6months effectiveness of Levetiracetam Vs oxcarbazepine medications

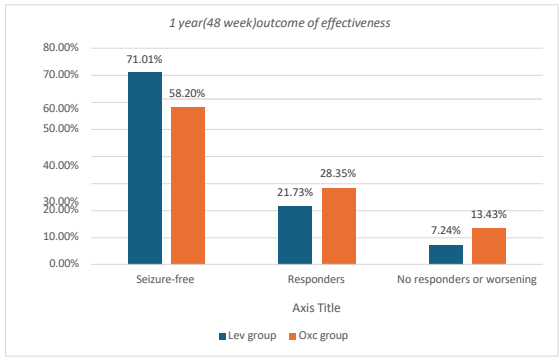


Figure 3: 1-year effectiveness of Levetiracetam Vs Oxcarbazepine medication

Table 3: Reported adverse events (AEs)(n=160)

Adverse events	**Levetiracetam n=11**	**Oxcarbazepine n=13 (%)**
somnolence	3 (3.75%)	3 (3.75%)
Irritation	2 (2.5%)	2 (2.5%)
Dizziness	2 (2.5%)	1 (1.25%)
Excitement	2(2.5%)	0
Vomit	1(1.25%)	3(3.75%)
Weakness (Asthenia)	1 (1.25%)	1 (1.25%)
Maculopapular rash	0	2(2.5%)
DIHS	0	1(1.25%)

DIHS: Drug induced hypersensitivity syndrome

Figure 4: Percentage of adverse events reported in both groups

Table 4: WHO-UMC scale applied to adverse event reported patients.

WHO-UMC scale	**Levetiracetam**	**Oxcarbazepine**
Certain	2	2
probable	6	5
Possible	3	6
Unlikely	0	0
Conditional/Unclassified	0	0

Unassessable/Unclassifiable	0	0

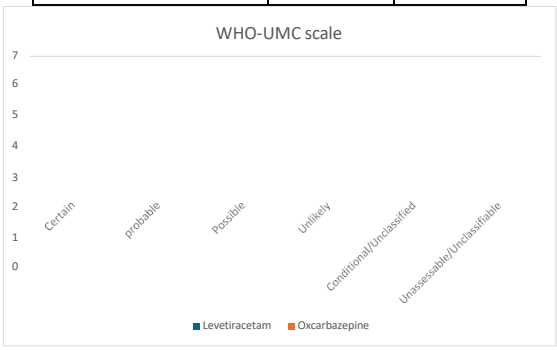


Figure 5: Showing WHO-UMC causality in two drug groups

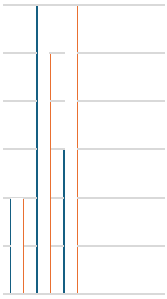


Table 5: Comparison of QOL scores in patients receiving LEV vs OXC AEDs at Baseline.

QOL Scales	LEVETIRACETAM	OXCARBAZEPINE
Seizure worry	59.25±3.195*	54.16±4.680
Overall quality of life	60.30±2.670*	52.69±3.173
Emotional well being	55.35±3.973	54.71±4.421
Energy/Fatigue	41.25±2.466	48.35±4.947**
Cognitive functioning	62.78±3.743	61.20±3.574
Medication effects	51.41±4.312	53.18±4.567
Social functioning	61.88±3.018**	56.38±4.212
Overall score	56.13±4.860	54.01±4.312

*Data expressed as Mean ± SEM, intergroup significance (Levetiracetam vs Oxcarbazepine) analysed by unpaired "t" test, depicted as *(p<0.05)*
***(p<0.01), ***(p<0.001)*

Figure 6: Comparison of QOL Scores in patients receiving Levetiracetam Vs Oxcarbazepine at baseline

Table 6: Comparison of QOL scores in patients receiving Levetiracetam Vs Oxcarbazepine AEDs at 3 months

QOL Scales	LEVETIRACETAM	OXCARBAZEPINE
Seizure worry	62.67±2.186*	58.26±3.928
Overall quality of life	60.30±2.670**	52.69±3.173
Emotional well being	58.35±3.783	56.73±2.527
Energy/Fatigue	43.26±3.367	52.35±3.247**
Cognitive functioning	66.37±2.928	63.27±3.802
Medication effects	54.47±3.319	56.18±4.863
Social functioning	63.29±2.913*	59.79±2.312
Overall score	58.25±4.973	57.01±4.558

*Data expressed as Mean ± SEM, intergroup significance (Levetiracetam vs Oxcarbazepine) analysed by unpaired "t" test depicted as *(p<0.05)*
***(p<0.01), ***(p<0.001)*

Figure 7: Comparison of QOL Scores in patients receiving Levetiracetam Vs Oxcarbazepine at 3 months

Table 7: Comparison of QOL scores in patients receiving Levetiracetam Vs Oxcarbazepine at 3 months

QOL Scales	LEVETIRACETAM	OXCARBAZEPINE
Seizure worry	60.92±3.193	59.33±2.968
Overall quality of life	63.43±2.324*	58.92±3.279
Emotional well being	61.17±2.74*	59.56±2.851
Energy/Fatigue	61.26±2.911*	59.15±1.748
Cognitive functioning	69.37±3.035*	65.97±5.875
Medication effects	66.79±2.848**	60.38±3.913
Social functioning	71.56±2.802**	66.83±2.428
Overall score	68.34±3.203**	62.01±3.354

*Data expressed as Mean ± SEM, intergroup significance (Levetiracetam vs Oxcarbazepine) analysed by unpaired "t" test depicted as *(p<0.05),*
***(p<0.01), ***(p<0.001)*

Figure 8: showing Comparison of QOL scores in patients receiving LEV vs OXC AEDs at 6month

Table 8: Comparison of QOL scores in patients receiving Levetiracetam Vs Oxcarbazepine AEDs at 12months

QOL Scales	Levetiracetam	Oxcarbazepine	Significance
Seizure worry	71.17±2.393*	67.26±2.768	P<0.05
Overall quality of life	71.45±4.574	70.24±1.182	P>0.05
Emotional well being	72.17±2.443	70.56±2.516	P>0.05
Energy/Fatigue	66.24±2.711*	64.17±1.896	P<0.05
Cognitive functioning	75.60±3.455**	71.01±3.096	P<0.01
Medication effects	75.57±2.686**	70.28±1.323	P<0.01
Social functioning	76.43±2.982	74.73±1.687	P>0.05
Overall score	74.92±3.097*	70.67± 3.765	P<0.05

*Data expressed as Mean ± SEM, intergroup significance (Levetiracetam vs Oxcarbazepine) analysed by unpaired "t" test depicted as *(p<0.05)*
***(p<0.01), ***(p<0.001)*

Figure 9: Comparison of QOL scores in patients receiving LEV vs OXC at 12 months

Figure 9: shows comparison of Total score of QOLIE-31 in two drug groups

Figure 10: shows comparison of Seizure worry subsection of QOLIE-31 in two drug groups

Figure 11: shows Comparison of Overall quality of life in QOLIE-31 in two drug groups

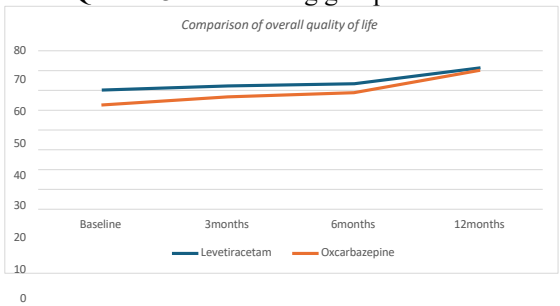


Figure 12: Comparison of emotional wellbeing in QOLIE-31 in two groups

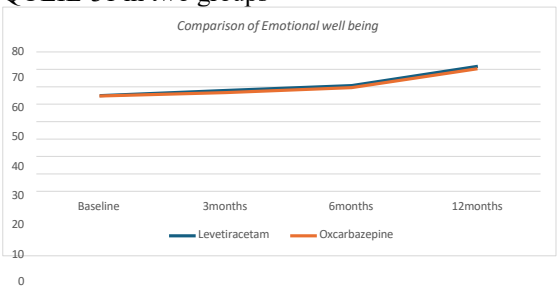


Figure 13: Comparison of Energy/Fatigue in QOLIE-31 in two groups

Figure 14: Comparison of Cognition in QOLIE-31 in two groups

Figure 15: Comparison of Medication effects in QOLIE-31 in two groups

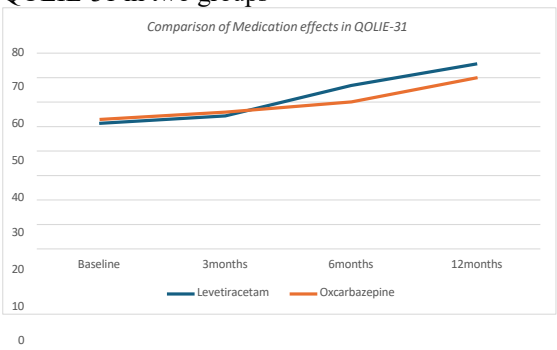


Figure 15 shows that medication effects improved over time for both groups, with levetiracetam demonstrating a more pronounced improvement than oxcarbazepine by 12 months.

Figure 16: Comparison of Social function in QOLIE-31 in two groups

Table 9: Comparison of QOLIE-31 scores in patients receiving Levetiracetam AEDs(n=80)

QOL Scales	Baseline	3 months	6 months	12 months
Seizure worry	59.25±3.195	62.67±2.186	60.92±3.193	71.17±2.393** Vs 0,3,6
Overall quality of life	60.30±2.670	60.30±2.670	63.43±2.324	71.45±4.574** Vs 0,3
Emotional well being	55.35±3.973	58.35±3.783	61.17±2.74* vs 0	72.17±2.443** Vs 0,3
Energy/Fatigue	41.25±2.466	43.26±3.367	61.26±2.911** Vs 0,3	66.24±2.711*** Vs 0,3
Cognitive functioning	62.78±3.743	66.37±2.928	69.37±3.035* Vs 0	75.60±3.455** Vs 0,3
Medication effects	51.41±4.312	54.47±3.319	66.79±2.848** Vs 0,3	75.57±2.686*** Vs 0,3
Social functioning	61.88±3.018	63.29±2.913	71.56±2.802** Vs 0	76.43±2.982** Vs 0,3
Overall score	56.13±4.860	58.25±4.973	68.34±3.203	74.92±3.097*** Vs 0,3

*Data expressed as Mean ± SEM, analysed by one-way ANOVA with Tukey's post-hoc test depicted as *(p<0.05) **(p<0.01), ***(p<0.001)*

Figure 17: Comparison of QOL scores in patients receiving Levetiracetam AEDs

Table 10: Comparison of QOLIE-31 scores in patients receiving Oxcarbazepine AEDs(n=80)

QOL Scales	Baseline	3 months	6 months	12 months
Seizure worry	54.16±4.680	58.26±3.928	59.33±2.968	67.26±2.768* Vs 0,3
Overall quality of life	52.69±3.173	52.69±3.173	58.92±3.279	70.24±1.182** Vs 0,3
Emotional well being	54.71±4.421	56.73±2.527	59.56±2.851	70.56±2.516** Vs 0,3
Energy/Fatigue	48.35±4.947	52.35±3.247	59.15±1.748	64.17±1.896* Vs 0
Cognitive functioning	61.20±3.574	63.27±3.802	65.97±5.875	71.01±3.096* Vs 0,3

Medication effects	53.18±4.567	56.18±4.863	60.38±3.913	70.28±1.323** Vs 0,3
Social functioning	56.38±4.212	59.79±2.312	66.83±2.428	74.73±1.687* Vs 0,3
Overall score	54.01±4.312	57.01±4.558	62.01±3.354	70.67±3.765* Vs 0,3

*Data expressed as Mean ± SEM, analysed by one-way ANOVA with Tukey's post-hoc test depicted as *(p<0.05) **(p<0.01), ***(p<0.001)*

Figure 18: Comparison of QOL scores in patients receiving Oxcarbazepine AEDs

Discussion

In 160 patients with recently diagnosed focal epilepsy, the efficacy, tolerability, safety, and health-related quality of life of levetiracetam (LEV) and oxcarbazepine (OXC) were compared in this prospective, observational longitudinal trial. With a median age of 36 years for the LEV group and 34 years for the OXC group, as well as a median pretreatment seizure frequency of 3 (IQR 2–4) seizures, the two treatment groups were essentially similar at baseline. While 31.2% and 29.8% of patients receiving LEV and OXC, respectively, had aberrant MRI/CT results, 77.6% of patients getting LEV and 68.2% of patients receiving OXC had abnormal EEG findings. According to these results, the study population consisted of individuals who had focal epilepsy that was clinically proven and needed to start antiseizure medication. The main discovery was that throughout the early follow-up period, LEV was associated with a greater observed seizure-free rate. Compared to 63.6% of patients receiving OXC, 79.2% of patients receiving LEV were seizure-free at three months (p=0.005) (6).

Seizure independence was observed in 79.73% and 57.53% of the LEV and OXC groups at 6 months, respectively (p=0.001). These results point to a positive early seizure-control profile for LEV in this group. They are not the same as the multicenter randomized study by **Zhu et al.,** where at 12 and 24 weeks, OXC achieved noticeably greater seizure-free rates than LEV. Differences in patient characteristics, therapy dosages, follow-up protocols, geographic demographics, adherence, and research design could all be contributing factors to the disparity. There was no significant difference between LEV and OXC in seizure freedom after 24 weeks, according to a systematic review and meta-analysis of two randomized trials comprising 574 individuals with newly diagnosed focal epilepsy. This finding supports the conclusion that neither medication has proven to be universally superior. According to the current study, 71.01% of the LEV group and 58.20% of the OXC group experienced seizure independence after 12 months. In line with the general pattern shown at three and six months, the numerical difference favored LEV (7, 8).

However, there are contradictory statistical reports regarding the 12-month comparison in the thesis. Therefore, unless the original dataset is reanalyzed and statistical significance is confirmed, the difference should be stated as an observed numerical difference. This is especially crucial because long-term randomized research has shown that while LEV may have benefits in terms of treatment retention, OXC can have seizure-free rates that are on par with or greater than LEV. Although the 24- and 48-week seizure-free rates numerically favored OXC, LEV was not inferior than OXC over a 50-week period in the Korean randomized study. Additional details regarding partial treatment response are provided by the responder analysis. In the current trial, the percentage of patients in both therapy groups who achieved >50% seizure reduction without total seizure independence rose across follow-up, while the percentage who showed no improvement or deterioration declined. Therefore, with ongoing treatment, the study recommends increasing clinical stabilization (9).

However, while reporting these results, responder and seizure-free categories should be precisely defined and mutually exclusive due to the comparatively small responder category and the concurrently high seizure-free rates. Seizure response is dynamic and should be assessed over a sufficient period rather than at a single time point, according to recent longitudinal data from the Human Epilepsy Project, which also show significant diversity in treatment response within the first year. The two groups' treatment tolerability was essentially the same. There was no statistically significant difference between the 8.75% of patients treated with LEV and the 10.0% of patients treated with OXC who withdrew due to adverse effects. Somnolence, dizziness, excitation, vomiting, and rash were among the side effects that were reported. Although the current sample does not provide a statistically meaningful safety benefit for LEV, the slightly higher frequency of adverse events and dermatological reactions with

OXC is clinically significant. A recent prospective study of adults with recently diagnosed focal epilepsy found no significant difference in overall adverse-event scores among commonly used ASMs, highlighting the fact that patient characteristics and psychiatric comorbidity also have an impact on tolerability (10).

On the other hand, new research suggests that LEV may have negative behavioral and neuropsychiatric effects, such as aggression, irritability, anxiety, somnolence, and exhaustion, underscoring the necessity of proper clinical monitoring. The longitudinal evaluation of health-related quality of life using QOLIE-31 was a significant strength of the current study. During the 12-month follow-up, both groups showed steady improvement in all of the primary QOLIE-31 areas. The total QOLIE-31 score in the LEV group rose from 56.13 ± 4.86 at baseline to 74.92 ± 3.10 at 12 months. Additionally, improvements were noted in energy/fatigue, emotional well-being, social functioning, cognitive functioning, medication effects, and seizure fear. Similar progress was shown by the OXC group; whose overall score rose from 54.01 ± 4.31 to 70.67 ± 3.77. These results lend credence to the idea that effective epilepsy treatment entails more than just seizure reduction. Seizure frequency, side effects, melancholy, anxiety, stigma, and stress about seizures are all significant factors in determining quality of life, according to recent research (11).

However, since the trial was observational rather than randomized, the apparent benefit of LEV in a number of QOLIE-31 domains should be regarded with caution. Confounding by indication was possible because the treatment choice was based on the prescription of the treating neurologist. Additionally, the study only tracked patients for a year, had a small sample size, and was carried out at a single tertiary-care facility. Results may have been impacted by variations in dose titration, adherence, socioeconomic factors, seizure phenotype, psychiatric condition, and baseline quality of life. However, the QOLIE-31 assessment, adverse-event monitoring, seizure diaries, standardized follow-up at 3, 6, and 12 months, and longitudinal design offer valuable practical evidence. For focal seizures, current NICE guidelines acknowledge LEV as a first-line monotherapy option and OXC as a backup monotherapy option in the event that first-line treatment fail (12).

Overall, the present findings suggest that both LEV and OXC are effective and generally tolerable options for newly diagnosed focal epilepsy. LEV demonstrated higher observed seizure-free rates at 3 and 6 months and favorable quality-of-life trajectories, while treatment discontinuation due to adverse events was comparable between groups. These results support individualized ASM selection rather than assuming universal superiority of one drug.

Conclusion

Both levetiracetam and oxcarbazepine showed clinically significant seizure control and tolerable tolerability over a 12-month period in this prospective longitudinal analysis of patients with recently diagnosed focal epilepsy. Levetiracetam demonstrated numerically higher seizure-free rates at 12 months and significantly higher observed seizure-free rates at 3 and 6 months. However, the statistical significance of the 12-month difference has to be confirmed due to inconsistent reporting in the original dataset. Levetiracetam demonstrated a positive overall quality-of-life trajectory, while both therapies were linked to a progressive improvement in QOLIE-31 scores across several areas. Adverse event-related treatment discontinuation was similar between groups. Based on seizure characteristics, comorbidities, adverse-effect susceptibility, patient preference, and cost, treatment selection should be tailored. These results suggest levetiracetam and oxcarbazepine as viable monotherapy options. Larger randomized multicenter studies with standardized outcome definitions and longer follow-up are required to establish comparative long-term effectiveness and safety.

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