Association between levetiracetam use and survival in glioblastoma patients : a nation-wide population-based study

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Introduction

- Levetiracetam (LEV) has become a preferred antiepileptic drug for Glioblastoma (GBM) patients over the last decade, mainly because of its safety profile and efficacy.
- Its use as a preventive measure in those without seizure history is debated. Furthermore, there's growing evidence pointing to a potential role of LEV in influencing the development and progression of GBM.
- Given these findings, examining the relationship between LEV use and survival outcomes in GBM patients becomes crucial.


Original Article

Survival Benefit of Levetiracetam in Patients Treated With Concomitant Chemoradiotherapy and Adjuvant Chemotherapy With Temozolomide for Glioblastoma Multiforme

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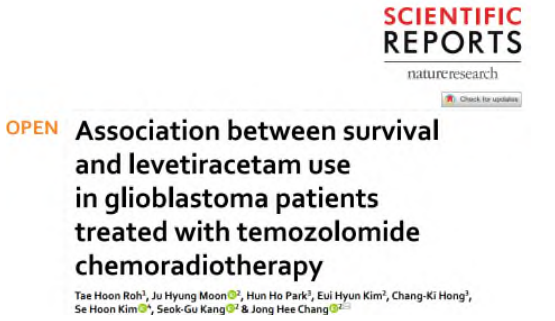
https://doi.org/10.1002/cncr.29439


SCIENTIFIC REPORTS

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Association between survival and levetiracetam use in glioblastoma patients treated with temozolomide chemoradiotherapy

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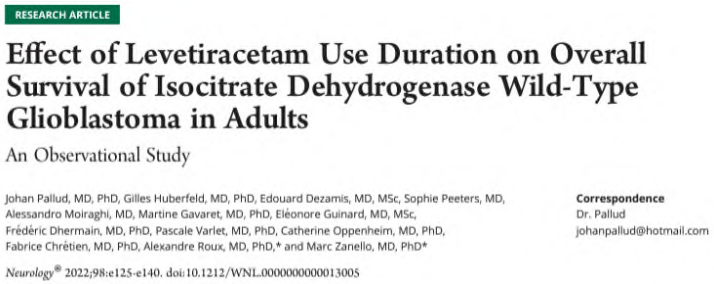
https://doi.org/10.1038/s41598-020-67697-w


RESEARCH ARTICLE

Effect of Levetiracetam Use Duration on Overall Survival of Isocitrate Dehydrogenase Wild-Type Glioblastoma in Adults

An Observational Study

Johan Pallud, MD, PhD, Gilles Huberfeld, MD, PhD, Edouard Dezamis, MD, MSc, Sophie Peeters, MD, Alessandro Moiraghi, MD, Martine Gavaret, MD, PhD, Eléonore Guinard, MD, MSc, Frédéric Dhermain, MD, PhD, Pascale Varlet, MD, PhD, Catherine Oppenheim, MD, PhD, Fabrice Chrétien, MD, PhD, Alexandre Roux, MD, PhD,* and Marc Zanello, MD, PhD*

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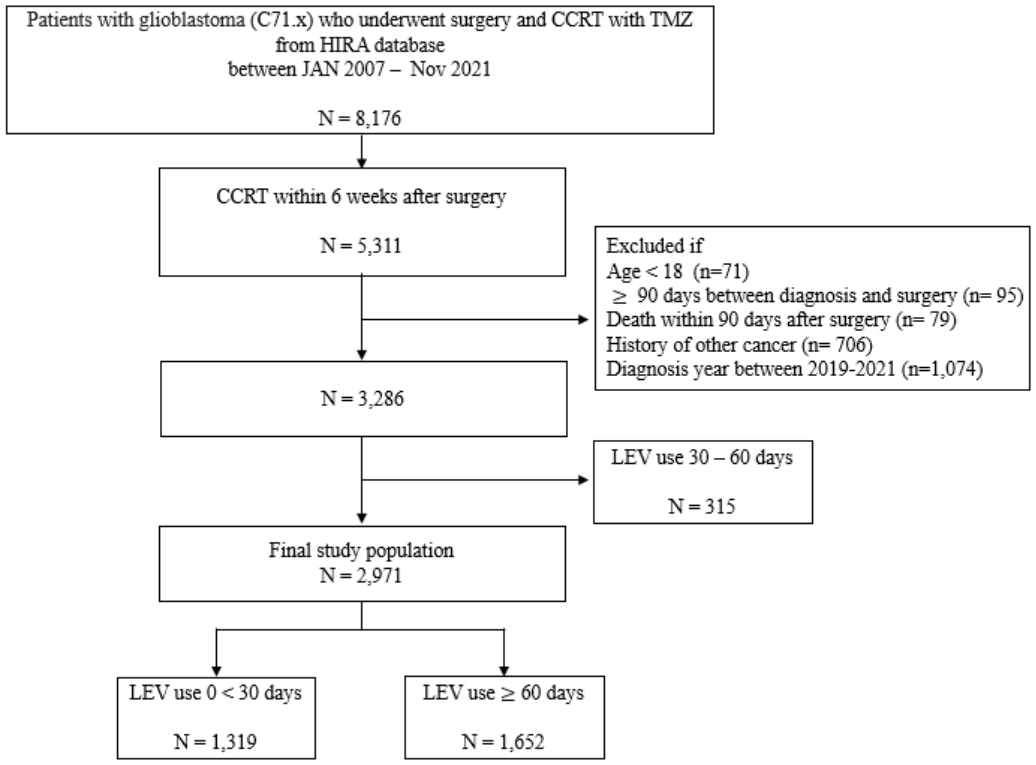
Neurology® 2022;98:e125-e140. doi:10.1212/WNL.0000000000013005

Methods

- Our study encompassed GBM patiens in the Health Insurance Review & Assessment Service (HIRA) database, aiming to determine how the duration of LEV use impacts the survival outcome in GBM patients.
- Study design
  - Restrospective, Nation wi
- Inclusion criteria
  - ICD-10 code C71.x who underwent cranial surgery and tumor removal
  - Administered temozolomide chemotherapy and radiation treatment within six weeks post-surgery
  - Treated between January 2007 and November 2021
- Exclusion criteria
  - Diagnosed under the age of 18
  - more than a 90-day gap between their initial diagnosis and surgical procedure
  - who died within 90 days of surgery
  - patients diagnosed between 2019 and 2021

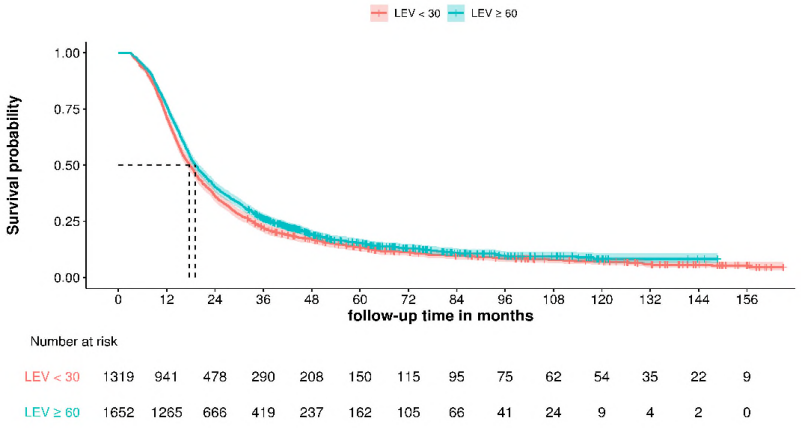
[Flow chart for patient selection]



- 1,535 were in the Short-term LEV group (less than 30 days) and 2,510 in the Long-term LEV group (60 days or more)

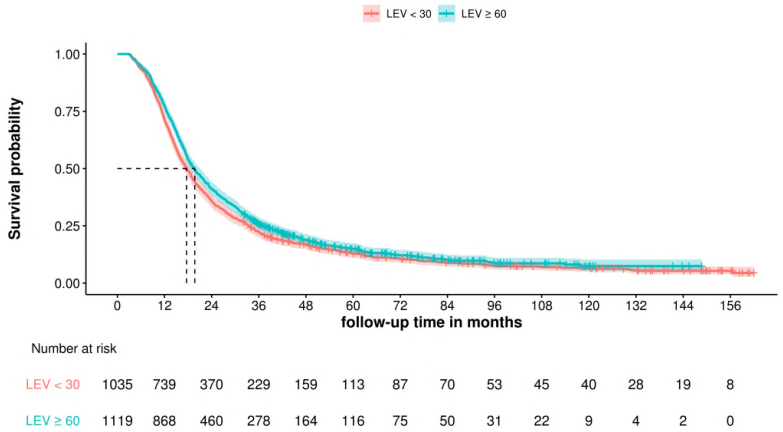
Results

	Death, n (%)	Median survival months, 95% CI	Log rank P
LEV (<30)	1,208 (91.6)	17.64 [16.69, 18.79]	0.0046
LEV (≥ 60)	1,408 (85.2)	19.06 [18.27, 20.14]	



Log-rank test & Kaplan-Meier curves for short-term LEV group and long-term LEV group in relation to overall survival.

	Death, n (%)	Median survival months, 95% CI	Log rank P
LEV (<30)	951 (91.9)	17.61 [16.59, 18.79]	0.0087
LEV (≥ 60)	958 (86.5)	19.71 [18.46, 21.03]	



Kaplan-Meier curves for short-term LEV group and long-term LEV group in patients without history of seizures

Discussion

- Our study revealed that administering LEV for prolonged duration (more than 60 days in this study) provides survival benefits to GBM patients under standard treatment protocols.
- The long-term LEV group demonstrated a significantly prolonged median survival of 19.06 months compared to the short-term LEV group with a median survival of 17.64 months.
- The survival benefit was also evident in patients without a seizure history and was more profound when comparing LEV-treated patients with those on VPA.
- This suggests the survival benefit of LEV may not be solely attributed to its antiepileptic properties
- To our knowledge, our study has the most extensive sample size for this topic.
- Despite its retrospective design and the inability to ascertain previously recognized prognostic markers like KPS, MGMT promotor methylation and IDH mutation status, the likelihood of selection bias remains minimal due to the unselected nature of our study population.
- Although the current study could not determine the most likely mechanism or provide insights into a new explanation, when taking into account previous experimental and clinical research outcomes, it seems that the OS-extending effects of LEV have accumulated scientific evidence over time.

Conclusion

- Our study demonstrates that the administration of Levetiracetam appears to enhance survival rates in glioblastoma patients, independent of their preoperative seizure history.

- These survival benefits may even exceed those provided by valproic acid, suggesting a potential role for Levetiracetam beyond its traditional use as an antiepileptic drug.

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