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The Role of Prophylactic Levetiracetam for Patients with Brain Tumors Treated in a CNS Multidisciplinary Clinic for Radiation Oncology and Neurosurgery (RADIANS) and a Review of Literature

Brandi W Pang; Samantha C Bowen; Rohi Gheewala; Alexandra Hoffman; Brandon Lucke-Wold, MD, PhD; Wencesley Paez, MD, MSHS; Timur Mitin, MD, PhD; Jeremy N. Ciporen, MD

pangb@ohsu.edu
Oregon Health & Science University

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Abstract

Background

Seizure incidence following open craniotomy for brain tumors varies in the literature between 5-27%, and following endoscopic endonasal approach ranges from 0-6.25%. Efficacy of prophylactic anticonvulsant therapy in reducing postoperative seizure rates is inconclusive. Furthermore, there is a paucity of evidence for its role during radiotherapy. The RADIANS clinic, a community hospital-based multidisciplinary central nervous system clinic with radiation oncology and neurosurgery, provides a unique model for continuity of care of patients with brain tumors. Prophylactic levetiracetam (LEV) therapy is provided perioperatively, postoperatively, and during radiotherapy.

Objective

To determine the effect of LEV on seizure complications in patients with brain tumors evaluated at a multidisciplinary community hospital clinic.

Methods

Retrospective analysis of patients with benign and malignant tumors who underwent neurosurgical resection and radiotherapy while receiving LEV for seizure prophylaxis was conducted. Patients were evaluated between July 2016 to August 2021 in the RADIANS clinic. Seizure episodes intraoperatively, at three months postoperatively, during radiotherapy, or at three months post-radiotherapy were recorded. A review of literature on the efficacy of prophylactic LEV use on postoperative seizures were reviewed for comparison.

Results

Sixty-five patients underwent neurosurgical resection while on prophylactic LEV. One patient developed side effects from LEV. Seizure outcomes are summarized in the paper. RADIANS clinic outcomes were compared to published literature and demonstrated in the paper as well.

Conclusion

The RADIANS clinic model is unique in that it provides continuity of care for patients with brain tumors and seizure prophylaxis throughout treatment. LEV demonstrated low toxicity. Our rates of breakthrough postoperative seizures are comparable to published data.