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# Multicenter basket trial for Central Nervous System tumors identifies activity of the CDK4/6 inhibitor abemaciclib in recurrent meningioma

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## Abstract

**Background:** Central nervous system (CNS) tumors are associated with considerable morbidity and high mortality. Cyclin-dependent kinases (CDKs) regulate cell division in cancer, and CDK4/6 inhibitors are used for the treatment of breast cancer, representing an attractive therapy for different tumor types.

**Methods:** Here, we report mature results of a multicenter basket trial exploring the CDK4/6 inhibitor abemaciclib in patients with recurrent CNS tumors, including patients with glioma, primary CNS lymphoma, meningioma, and ependymoma. We expanded our cohort of meningioma patients based on preliminary evidence for activity. Patients were treated with 200mg oral abemaciclib twice daily for days 1-28, following FDA recommendations for breast cancer. Primary outcomes included radiographic response rates and progression free survival (PFS) at 6 months post-treatment. We also evaluated overall survival (OS) and toxicity. Exploratory outcomes included next-generation sequencing of tumor biopsies.

**Results:** Most cohorts did not demonstrate activity with the exception of the cohort of patients with recurrent meningioma, including patients with grade 2 or 3 disease (19/22 meningioma patients). In that group, the median PFS was 15 months (95% CI: 6.5, not reached) and median OS was 32.9 months (95% CI: 10.7, not reached), the 6-month PFS was 68.2% (95% CI: 51.3%, 90.7%). All 22 patients were evaluable for radiographic response, showing stable disease in 16/22 (73%) and progressive disease in 6/22 patients (27%).

**Conclusion:** Our data suggests that abemaciclib improves PFS and OS in patients with advanced meningioma. The 6-month PFS with abemaciclib in this study (68.2%) exceeded RANO proposed benchmarks for activity (49%).Trial registration: NCT03220646.

**Keywords:** Meningioma; abemaciclib; brain tumors; clinical trial.

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