pression, it was 41% (95% CI: 22%-62%) for primary vs. 58% (95% CI: 35%-78%) for LCBM; for PD-L1 expression of 1–50%, it was 24% (95% CI: 13%-40%) vs. 19% (95% CI: 10%-33%); and for PD-L1 >50% it was 12% (95% CI: 4%-33%) vs. 21% (95% CI: 14%-29%) (p=0.425). The pooled estimate for overall PD-LI receptor discordance between primary and LCBM was 17% (95% CI: 10%-27%). Meta-regression analysis showed that age, sex, smoking status, and histology were not associated with PD-LI receptor discordance. CONCLUSIONS: PD-L1 status discordance in tumor cell occurs in approximately 20% of LCBM, with the greatest discordance in the <1% expression category. Awareness of this discordance is important for the selection of immune checkpoint inhibitor therapy as well as in the analysis of patterns of failures.

OTHR-08. EFFICACY OF ANTI-EPILEPTIC DRUG PROPHYLAXIS ON SEIZURE PREVENTION IN PATIENTS WITH BRAIN METASTASES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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INTRODUCTION: Seizures can occur in patients with brain metastasis and are often debilitating, leading to morbidity, mortality, and economic burden. Implementation of anti-epileptic drugs (AEDs) prophylaxis remains controversial, and provider dependent as current Level III guidelines recommend against their use. This systematic review gathers the current evidence on the effectiveness of AED prophylaxis on preventing new-onset seizures in patients with BM. Associated adverse effects of AED usage in this population are also reported. METHODS: Using PRISMA guidelines, a pertinent search was conducted on Embase, PubMed, and Web of Science to identify journal articles that reported AED prophylaxis as a variable to modify seizure frequency in adult patients with BM. Data of interest included AED agent, new-onset seizure frequency, and safety profile. A meta-analysis was performed to calculate odds ratio using Der-Simonian and Laird methods to compare AED group with control for new seizures. Heterogeneity was determined by Cochran Q test and I2. RESULTS: Our search returned 175 publications of which 5 retrospective cohort studies met inclusion criteria. A total of 1,292 patients (283 receiving AED prophylaxis, and 1,009 in control group) were included across the studies. AEDs used were phenobarbital, levetiracetam, phenytoin, and valproate. Meta-analysis showed no difference in seizure frequency between the AED and the control group (OR = 0.98; 95%-CI: 0.56–1.72). Heterogeneity: I^2 = 7%. Adverse events were not reported in the publications. CONCLUSION: Our meta-analysis suggests that there is no improvement in frequency of new seizures with AED prophylaxis in BM patients, supporting current guidelines. However, the evidence is based on a small patient population and retrospective studies. Additional studies are needed to determine efficacy of prophylaxis with newer AEDs and establish guidelines to target therapies for improving morbidity, mortality, and quality of life in patients with BM.

OTHR-09. ACCELERATING RESEARCH FOR BREAST CANCER BRAIN METASTASIS AND LEPTOMENINGEAL DISEASE THROUGH PATIENT-LED COLLABORATIONS

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PATIENT-DRIVEN INITIATIVE OF THE METASTATIC BREAST CANCER (MBC) ALLIANCE: The Breast Cancer Brain Metastasis (BCBM) Initiative: Marina Kaplan Project launched in June 2020 as an official project of the MBC Alliance which includes 32 nonprofits, 12 industry partners, and 30 individual patient advocates. The Marina Project has grown to include 35 members with representation from industry, research institutions, and individual patients. Nearly one-third of the group is comprised of patients living with brain metastases or leptomeningeal disease (LMD). DISPARITIES FOR PATIENTS LIVING WITH BCBM & LMD: In the US, approximately 200,000 new cases of brain metastases are diagnosed each year[1]. Approximately 10–15% of patients with MBC will develop brain metastases, and may be as high as 30–50% for certain subtypes[2]. A diagnosis of central nervous system (CNS) metastasis often accelerates an already incurable diagnosis. CNS metastasis are difficult to image and detect, tend to have poorer prognoses with lower overall survival, and are treated with invasive therapies which can have lasting side effects. Furthermore, most clinical trials exclude patients with CNS metastasis which further hinders research. VALUES AND OBJECTIVES: The overarching goal of this initiative is to accelerate the scope and breadth of evidence-based CNS metastasis research by targeting entities conducting clinical trials and collaborating with them to do the following:

(i) Increase the quality and quantity of basic research;
(ii) Increase the number of clinical trials in areas where research is lacking;
(iii) Diversify the type of clinical trial interventions;
(iv) Eliminate restrictive eligibility criteria in clinical trials;
(v) Incorporate clinically meaningful trial endpoints

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OTHR-10. DIVERSE SURVIVAL OUTCOMES OF HER2+ BREAST CANCER BRAIN METASTASES (BRCBM) PRESENTING WITH ISOLATED BRAIN RELAPSE COMPARED TO THOSE WITH CONCURRENT EXTRACRANIAL DISEASE

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BACKGROUND: In patients with isolated HER2+ BrCBM and no extracranial disease (ECD), there are no consensus guidelines on optimal treatment approaches following CNS-directed therapy. Our goal was to determine the implications of ECD at time of first HER2+ BrCBM on intracranial progression-free survival (PFS1) and overall survival (OS). METHODS: Retrospective analysis was performed on 77 patients with HER2+ BrCBM who received 1st CNS radiation from 2006–2020. Demographics, dates of metastatic and intracranial diagnosis, ECD status at 1st BrCBM, and outcomes were collected. The primary endpoint was PFS1 defined as time from first CNS radiation to the subsequent documentation of intracranial progression (RANO-BM). OS was defined as time from 1st CNS radiation and 1st metastatic disease to date of death/last known alive. ECD status was defined by RECIST1.1 from staging scans within 30 days of 1st BrCBM. RESULTS: In this patient cohort, 25% (19/77) had isolated brain relapse/no ECD. Median age was 50 years. Most patients (58%) developed first BrCBM during adjuvant or early-line metastatic therapy. All patients with no ECD presented with isolated brain relapse as first metastatic presentation. Patients with concurrent ECD presented with first BrCBM at a median of 16.6m (95% CI: 10.5 to 25.3) after initial metastatic presentation. Median OS from initial metastatic presentation to death was worse for patients with isolated brain relapse (25.3m, 95% CI: 16.8 to 35.3) compared to those with concurrent ECD (49.7m, 95% CI: 43.2 to 62; p=0.01). Median OS from first CNS involvement to death was not statistically different amongst groups. CONCLUSIONS: Patients with isolated HER2+ BrCBM as their initial metastatic event have substantially worse OS compared to patients with concurrent ECD developing CNS metastases later in their disease course. This population with isolated brain relapse deserves investigation of novel treatment algorithms, including earlier introduction of brain-penetrable HER2-targeted agents.

OTHR-11. COMPREHENSIVE ANALYSIS OF DRIVER MUTATION PROFILE IN A COHORT OF LUNG CANCER PATIENTS USING TARGETED GENE PANEL ANALYSIS WITH FOCUS ON BRAIN METASTATIC DISEASE

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PURPOSE: Approximately 228,820 people are diagnosed annually with lung cancer diagnosis and 135,720 die from their disease[1]. *EGFR* and *KRAS* targeted therapies have been shown to significantly improve treatment of non-small cell lung cancer (NSCLC), but they don't apply to the majority of patients. There's a critical need to characterize the molecular signature of patients with lung cancer and to define the proportion of patients eligible for novel targeted therapies. METHODS: IRB approval was obtained to retrospectively extract data from tertiary hospital tumor registry from 2011 to 2017. Data collected included patient demographics, targeted next generation sequencing results (50 and 150 gene panel), histology, and biopsy location in the final 2,203 patients, 715 of which were manually checked. FINDINGS: 83.8% of patients in the lung cancer cohort that had targeted next-generation gene panel analysis demonstrated presence of at least one mutation. 50.9% of the patients in our cohort had a targetable mutation. There were 9.5% with hypermutated phenotype characterized as at least 5 mutations per sample. 1.3% of patients had at least 10 mutations per sample. We also characterize the distribution of mutations within brain metastatic lesions and demonstrate that brain metastases with hypermutated phenotype demonstrate larger volumes of edema and greater involvement of deep white matter than non-hypermutated brain metastases. CONCLUSION: We present a comprehensive analysis of the molecular signature of lung cancer from a tertiary referral institution with focused analysis of brain metastases. Lung cancer brain metastases with greater than 5 mutations correspond to greater volume of edema and involvement of deep white matter.