as time between surgery and death. Cox proportional hazards regression compared the relationship between Ki-67 index and overall survival after controlling for age, sex, race, marital status, medical comorbidities, initial T2 tumor volume, radiotherapy and chemotherapy. RESULTS: There were 69 patients in the study. Demographics, comorbidities, radiotherapy and chemotherapy did not differ between Ki-67 groups. Median survival time (weeks) was 61.7 (32.9–132.6), 34.9 (13.6–84.9), and 39.3 (16.7–84.1) for Ki-67 ≤ 10, 10 < Ki-67 ≤ 20, and Ki-67 > 20 groups, respectively. There was no significant difference in survival between Ki-67 groups in unadjusted (p=0.69) or adjusted analyses (p=0.83). However, older age (1.06 hazard ratio, 1.01–1.11 CI, 0.01 p-value), radiotherapy (91.5, 4.38-1911.27, 0.004), arthritis (7.81, 1.30–46.79, 0.03), diabetes (7.22, 42.14, 0.03), and hypercholesterolemia (15.76, 3.40–72.97, < 0.001) were associated with shorter survival. CONCLUSIONS: This study demonstrated no relationship between Ki-67 index and survival in patients with GBM when controlling for other factors, but highlighted factors related to poorer survival (older age, radiotherapy, arthritis, diabetes, hypercholesterolemia). Further prospective studies on the association between survival and Ki-67 index in a larger cohort of patients with GBM are warranted.

HOUT-06. PATTERN OF LOW FIELD INTENSITY RECURRENCE IN HIGH-GRADE GLIOMAS FOLLOWING TUMOR TREATMENT FIELD THERAPY

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BACKGROUND: Glioblastoma (GBM) is an aggressive neoplasm that continues to show recurrence despite recent advances in therapy. Tumor Treating Fields (TTFields) is a non-invasive, regional antimitotic treatment modality, delivering low-intensity (1–3 V/cm), intermediate-frequency (100–300 kHz), alternating electric fields to tumors via transducer arrays placed on the scalp of GBM patients. TTFields disrupts cell division processes in cancer cells. However, some mechanisms of escape have been described, in particular, out-of-field tumor recurrence. The brainstem dose not receive high intensity electric field stimulation during TTFields therapy, and represents one possible region of tumor recurrence following treatment. METHODS: Six cases were identified via retrospective chart review from multiple providers that have experience with prescribing and planning treatment with TTFields. Clinical and radiographic reviews were performed after de-identification of patient records. Cases were compared according to demographics, tumor location and region of recurrence. RESULTS: The median patient age at diagnosis was 62 years (Range: 10–69) with 3/6 patients being male and 3/6 patients being female. Tumors were initially located in the frontal (3/6), parietal (2/6), and temporal lobes (1/6). Three patients received TTFields therapy at initial diagnosis in combination with surgery and chemoradiation, while the remaining patients received TTFields therapy at initial recurrence in conjunction with bevacizumab. Following TTFields treatment, tumors recurred predominantly in the pons (1/6), left cerebellar peduncles (3/6), and right cerebellar peduncles (2/6). The average time to brainstem recurrence following TTFields therapy was 152 days (Range: 49–228). CONCLUSIONS: Treatment options for patients with GBM are limited, however TTFields has been shown to improve overall survival when combined with temozolomide. TTFields can only be delivered in therapeutic intensities to the supratentorial brain. Brainstem recurrence may occur as field intensity in the brainstem is sub-therapeutic. Further investigation is warranted to determine optimal treatment for brainstem recurrences for patients receiving TTFields therapy.

HOUT-07. AN EVALUATION OF THE TREATMENT COURSE IN PATIENTS WITH GLIOBLASTOMA MULTIFORME

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INTRODUCTION: Glioblastoma multiforme (GBM) is a malignant brain tumor with a mean overall survival of 15 months using current treatment modalities. Previous studies have shown delays in treatment result in worse outcomes. Demographic and socioeconomic factors may have a role in treatment course variations. Therefore, the objective of this study was to investigate factors that influence time to treatment and effect overall survival in patients with GBM. METHODS: Records from patients who were diagnosed with GBM and underwent surgery, radiotherapy, or chemotherapy at VCU Health between 2005 and 2015 were retrospectively reviewed. Linear regression was used to determine whether demographics, socioeconomic status, or presenting symptoms were associated with the time from first clinic visit to time of surgery, chemotherapy, radiotherapy first treatment, and time until all treatments were initiated. Then, cox proportional hazards regression assessed whether these five outcomes were independently related to overall survival. RESULTS: 126 patients were included in the study. Median survival was 10.6 months. None of the demographic factors or presenting symptoms were associated with time to treatment outcomes. Time to radiotherapy, chemotherapy, and all treatment initiation were significantly associated with overall survival after controlling for age, tumor location, and extent of resection (p< 0.01). A thirty-day decrease in time to radiotherapy, chemotherapy, and all treatment initiation were associated with increased mortality hazards of 1.05, 1.08, and 1.04, respectively. DISCUSSION: Our results indicated that demographics, socioeconomic factors, and presenting symptoms do not contribute to delays in treatment. Our study also revealed that, contrary to current literature, patients with shorter time to initiation of treatment had poorer outcomes. This could represent a specific population that presents later in their disease course and thus receives more aggressive treatment. Further investigation is therefore needed to elucidate the cause of this relationship and factors causing decreased survival in this population.

HOUT-08. COMORBID MEDICAL CONDITIONS AS PREDICTORS OF OVERALL SURVIVAL IN SURGICAL PATIENTS WITH GLIOBLASTOMA

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INTRODUCTION: Glioblastoma multiforme (GBM) is a common, fast-growing central nervous system tumor with poor prognosis. Survival from diagnosis to death is estimated to range from 7.2 to 26.6 months. Only a few predictors of survival have been well-established, including age, extent of resection (EOR), performance status, and MGMT status. Our objective was to determine whether demographic characteristics and comorbid medical conditions influence overall survival (OS) in surgical GBM patients. METHODS: Data came from the Virginia Commonwealth University (VCU) Brain and Spine Tumor Data Registry, which collects retrospective information on all patients who presented to VCU Health with a CNS tumor between January 2005 and February 2015. Patients diagnosed with GBM who underwent surgery and/or biopsy were included in this study. Cox proportional hazards regression controlling for age, EOR, and tumor location was used to assess the relationship between OS and sex, race, insurance status, marital status, alcohol/tobacco use, initial tumor volume, and comorbidities. Individual analyses were performed for each predictor and those with p<0.15 were entered into multivariate models. RESULTS: There were 163 patients who met inclusion criteria. Mean OS was 10.6 months with a survival probability of 66% at 6 months, 46% at 12 months, and 21% at 24 months. After individual analysis, sex (HR: 1.37, 95% CI: 0.98–1.92, p=0.07) and history of asthma (HR: 2.04, CI: 0.98–4.28, p=0.06), hypercholesterolemia (HR: 1.69, CI: 0.95–3.01, p=0.07), and depression/anxiety (HR: 1.81, CI: 1.04–3.16, p=0.04) were included in the final model. In multivariate modeling, no demographic characteristics or comorbidities were significantly associated with OS. CONCLUSIONS: History of depression/anxiety was significantly associated with OS on individual analysis. However, this association did not remain significant in final multivariate modeling. The potential link between depression/anxiety and survival in GBM patients needs further evaluation in studies with greater power, given this could be amenable to intervention.

HOUT-09. USING THE ASCO AND ESMO FRAMEWORKS TO ASSESS THE CLINICAL VALUE OF TUMOR TREATING FIELDS FOR NEWLY DIAGNOSED GLIOBLASTOMA MULTIFORME

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BACKGROUND: The effectivity and safety of TTFields in newly diagnosed GBM was recently demonstrated by the final analysis of the large, randomized controlled EF-14 Trial. To capture the clinical value of new cancer treatments, the American Society of Clinical Oncology (ASCO) and the European Society for Medical Oncology (ESMO) have both developed assessment frameworks. We quantified the clinical value of the TTFields treatment in GBM by applying ASCO and ESMO frameworks to the EF-14 trial data. MATERIALS/METHODS: The EF-14 Trial (n=695) proved the effect of adding TTFields to maintenance temozolomide (TMZ) for newly diagnosed glioblastoma patients. The ESMO Magnitude of Clinical Benefit Scale (MCBS) and the ASCO Net Health Benefit (NHB frameworks provide separate calculations for adjuvant therapies and treatments for advanced diseases. We applied both classifications to the EF-14 trial data as required by the framework rules. Quality of life data from the EF-14