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BACKGROUND: The COVID-19 pandemic has profoundly affected cancer services. Our objective was to determine the effect of the COVID-19 pandemic on decision making and the resulting outcomes for patients with newly diagnosed or recurrent intracranial tumors. METHODS: We performed a multi-centre prospective study of all adult patients discussed in weekly neuro-oncology and skull base MDTs who had a newly diagnosed or recurrent intracranial (excluding pituitary) tumor between 01 April and 31 May 2020. All patients had follow-up data at least 30-days after the index MDT date. Descriptive statistical reporting was used. RESULTS: There were 1357 referrals for newly diagnosed or recurrent intracranial tumors across fifteen neuro-oncology centres. Of centres with all intracranial tumors, a change in initial MDT management was reported in 8.6% of cases (n=104/1210). Decisions to change the MDT management plan reduced over time from a peak of 19% referrals at the start of the study to 0% by the end of the study period. Changes in management were reported in 16% (n=75/466) of cases previously recommended for surgery and 28% of cases previously recommended for chemotherapy (n=20/72). The reported SARS-CoV-2 infection rate was similar in surgical and non-surgical patients (2.6% vs. 2.4%, p >0.9). CONCLUSIONS: Disruption to neuro-oncology services in the UK caused by the COVID-19 pandemic was most marked in the first month, affecting all diagnoses. Patients considered for chemotherapy were most affected. In those recommended surgical treatment this was successfully completed. Longer-term outcome data will evaluate oncological treatments received by these patients and overall survival.

COVD-16. THE COVID-19 PANDEMIC FROM A NEURO-ONCOLOGY PERSPECTIVE: STRATEGIES, PROTOCOLS, AND LESSON LEARNED

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INTRODUCTION: The COVID-19 pandemic has had an incalculable impact on our national healthcare system, and elective surgical procedures have been particularly affected. Given that brain tumors often straddle the line between elective and emergent procedures, the pandemic has presented unique challenges to the neuro-oncology community. Here, we present our institutional protocols to (1) maintain an active outpatient neuro-oncology practice, (2) triage surgical cases under limited operating room availability, and (3) safely resume research efforts. METHODS: Given the rapidly evolving nature of the pandemic, we based the development of our protocols on the Delphi system to achieve consensus across a multi-disciplinary panel of experts. Specifically, we used this system to develop (1) a standardized physical examination that could be implemented over tele-medicine and (2) a triage system for surgical cases. Research efforts were largely suspended in the early days of the pandemic, however protocols for enrollment in clinical trials as well as the resumption of benchwork were also developed. RESULTS: From the COVID-19 shelter-in-place order (March, 2020) through May 2020, our department performed 96 surgeries for the resection of brain tumors compared to 127 such surgeries from the three months prior. During this time, using a modified Delphi procedure, we developed detailed protocols to triage tumor cases. Implementation of telemedicine outpatient visits allowed the continuation of the neuro-oncology clinic and, ultimately, the resumption of clinical trials. CONCLUSIONS: The protocols presented here offer several strategies to continue neuro-oncological care during the pandemic, including the surgical treatment of brain tumors. As we prepare for future outbreaks, these treatment algorithms will help ensure that patients with brain tumors receive the highest level of care independent of COVID-19.

COVD-17. TUMOR TREATING FIELDS FOR GLIOBLASTOMA THERAPY DURING THE COVID-19 PANDEMIC: EXPERT CONSENSUS ON USE AND EXPERIENCE

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BACKGROUND: The COVID-19 pandemic has placed excessive strain on health care systems and this is especially evident in treatment decision-making for cancer patients. Glioblastoma (GBM) patients are among the most vulnerable due to increased incidence in the elderly (median age 64 years, peak between 75–84 years) and the short survival time. A virtual meeting was convened on May 9, 2020 with a panel of international neuro-oncology experts with hands-on experience using Tumor Treating Fields (TTFields). The objective was to assess the risk-to-benefit and to provide guidance for using TTFields in GBM during the COVID-19 pandemic. PANEL DISCUSSION: Topics discussed included support and delivery of TTFields during the COVID-19 pandemic, concomitant use of TTFields with chemotherapy, and any potential impact of TTFields on the immune system in an intrinsically immunosuppressed GBM population. Special consideration was given to TTFields' use in elderly patients and in combination with radiotherapy regimens (standard versus hypofractionated). Finally, we discussed the need to better capture COVID-19 positive brain tumor patients to analyze longitudinal outcomes and subtle changes in treatment decision-making during the pandemic. EXPERT CONSENSUS: TTFields is a portable home-use device which can be managed via telemedicine and safely used in GBM patients during the COVID-19 pandemic. TTFields has no known immunosuppressive effects and is a reliable treatment modality with a relatively favorable side-effect profile. This is important during a crisis where other treatment methods might be limited, especially for elderly patients and patients with multiple co-morbidities. It is too early to estimate the full impact of COVID-19 on the global healthcare system and on patient outcomes and strongly recommended the need to collaborate with existing cancer COVID-19 registries (i.e. CCC19, ESMO-CoCARE, etc.) to follow CNS tumor patients. These efforts would have implications in assessing lessons-learned from this crisis and future guideline development.

COVD-18. POTENTIAL TO HARNESS SARS-COV-2 NEUROTROPISM IN THE DELIVERY OF ONCOLYTIC VIROTHERAPY FOR THE TREATMENT OF HIGH-GRADE GLIOMA

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BACKGROUND: High-grade gliomas (HGG) pose therapeutic challenges stemming from blood brain barrier, infiltrative growth, suppressed immune function, and tumor heterogeneity. Oncolytic viruses (OVs) are gaining traction for addressing these challenges. There is evidence that the SARS-CoV-2 glycoprotein spike binds the ACE-2 receptor in nasal epithelium and reaches the brainstem and thalamus via axonal transport through the olfactory pathway, making it an attractive candidate for OV therapy. Prior studies on chimerization of pathogenic virus-derived glycoprotein spikes with non-pathogenic strains exploit neurotropism of a wild-type virus while improving the safety profile of the resulting OV. We review, 1) the engineering of chimeric OVs used in the treatment of HGG; 2) potential for a novel chimeric virotherapy in which the SARS-CoV-2 glycoprotein spike can be used to deliver OV therapy intranasally; and 3) areas which warrant further investigation to develop this approach for clinical use. METHODS: We

performed an extensive review of chimeric OVs and specific modifications engineered to optimize safety and efficacy. Additionally, we assessed potential to use these principals to engineer the SARS-CoV-2 glycoprotein spike onto a non-pathogenic, replication competent virus to yield a novel chimeric for noninvasive, intranasal delivery. RESULTS: Viruses with pathogenic properties in wild-type have been successfully used as components of OVs and have demonstrated potential in both preclinical and clinical trials. Outcomes show that despite wild-type virulence, notable toxicities were not observed in clinical trials, highlighting the potential of viral pseudotyping as a safe therapeutic approach. CONCLUSIONS: The proposed method to utilize the SARS-CoV-2 glycoprotein in a novel chimeric poses advantages including 1) potential for non-invasive delivery, 2) therapy without need for maximal or uniform tumor coverage due to replication competence, 3) ability to reach infiltrative glioma cells, 4) potential to reach the brainstem, and 5) stimulation of host immunity through tumor cell lysis and antigen presentation

COVD-19. COGNITION, CANCER, AND COVID: DELIVERING DIRECT-TO-HOME TELE-NEUROPSYCHOLOGY SERVICES TO NEURO-ONCOLOGY PATIENTS

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BACKGROUND: The COVID-19 pandemic altered the delivery of healthcare services globally with a rapid adoption of telemedicine to meet patient's needs. Telemedicine is critical for neuro-oncology patients who may be at an increased risk of infection, yet require continuity of care. An important aspect of neuro-oncology care includes neuropsychological assessment, which can be challenging to complete outside of a structured testing environment. Teleneuropsychology (TNP) has been explored under proctored conditions and proven feasible and reliable. Conducting TNP visits directly to the patients' home (DTH-TNP) had minimal study prior to the pandemic, but was implemented to reduce COVID-19 exposure. METHODS: We used surveys to examine patient acceptance and clinician feasibility of DTH-TNP at two regionally diverse medical institutions routinely providing neuropsychological assessments services to neuro-oncology patients from April to August 2020, Massachusetts General Hospital (MGH) and Virginia Commonwealth University (VCU). RESULTS: 45 patients voluntarily responded (MGH=30, VCU=15) and 98 percent (MGH=100%, VCU=93%) of respondents were satisfied with the DTH-TNP experience. Nine percent (MGH=7%, VCU=13%) reported challenges (e.g., technological issues) during the appointment. Eighty-nine percent (MGH=90%, VCU=87%) would recommend the virtual visit to others. Patients perceived reduced risk of infection (MGH=77%, VCU=87%) and time traveling to clinic (MGH=87%, VCU=80%) as favorable aspects of DTH-TNP. 43 clinician surveys collected at MGH indicated that clinicians were able to achieve the goal of their appointment in 91% of clinical encounters. Common issues reported by clinicians included trouble connecting (7%) to the telemedicine platform and environmental disruptions (12%). DISCUSSION: This preliminary data suggests neuro-oncology patients and clinicians find DTH-TNP to be an acceptable and feasible practice, while also recognizing its limitations. This study is limited in that voluntary patient surveys are subject to bias. These results suggest that further study of DTH-TNP (e.g., reliability, validity, and limitations) for neuro-oncology patients is warranted. Future directions are discussed.

COVD-20. COVID-19 INFECTION DURING CHEMOTHERAPY FOR MALIGNANT GLIOMA: OUTCOMES AMONG 3 PATIENTS

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BACKGROUND: Chemotherapy may increase risk of SARS-COV-2 infection and COVID-19 severity. METHODS: A patient developed COVID-19 during chemotherapy for glioma. We retrospectively identified others diagnosed with COVID-19 during temozolomide or lomustine for glioma. RESULTS: (1) A 64 year-old woman (index patient) with anaplastic oligodendroglioma received PCV 22 months previously. Baseline White Blood Cell (WBC) count was 4.2 and Absolute Neutrophil Count (ANC) was 2.7 K/uL. KPS was 90 without comorbidities. For recurrence she initiated temozolomide but developed fever on cycle 1 day 2. SARS-COV-2 PCR was positive. Further temozolomide was held. She is recovering as an outpatient. (2) A 27 year-old man with anaplastic astrocytoma received concurrent RT/temozolomide then 1 cycle of adjuvant temozolomide. Baseline WBC was 8.3, ANC 5.2, and KPS 90. Obesity, asthma, and pre-diabetes were comorbidities. Hyposmia/hypogeusia and low-grade fever began, in retrospect, during concurrent RT/temozolomide. PCR for SARS-COV-2 was negative 2 months after symptom onset; serology detected both IgG and IgM when WBC was 6.6 and ANC 4.0. Cycle 2 of adjuvant temozolomide was held until fever resolved (spontaneously); hyposmia/hypogeusia persist. (3) A 53 year-old man with glioblastoma previously received RT/temozolomide, then lomustine and bevacizumab for progression. WBC was 5.1, ANC 4.0, and KPS 60. He was obese. Fever, chills, and dyspnea developed on lomustine cycle 2 day 38. SARS-COV-2 PCR was positive. He was hospitalized and chemotherapy held; symptoms resolved 12 days after onset, but PCR continued to show detectable virus 32 days later. PCR became negative after 50 days total, and treatment resumed uneventfully. DISCUSSION: All 3 patients recovered from SARS-COV-2 infection despite active temozolomide or lomustine chemotherapy. Normal ANC, high KPS, and early detection may have contributed to limited symptom severity and duration, despite obesity and other comorbidities in 2 cases. Detection changed management by delaying additional cycles of immunosuppressive chemotherapy until recovery.

COVD-22. COVID-19+ GLIOMA PATIENT CARE: LESSONS FROM A 5-PATIENT CASE SERIES

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Glioma patients, like other cancer patients, are at an increased risk of COVID-19 infections, but there are no specific guidelines on how their care should be modified during this pandemic. The challenge to develop such guidelines is largely related to the limited number of reported cases and lack of studies on this particular patient population. We present a 5-patient case series of glioma, detailing their baseline characteristics, treatment courses, lab abnormalities, and the changes made to their care after they developed COVID-19. The median age of the patient population was 66 years. All patients had IDH-wild type glioma (3 Grade IV, 1 Grade III, and 1 Grade II) and all of whom had received temozolomide chemotherapy shortly before COVID-19 diagnosis (median = 22 days). Three patients presented with mild non-respiratory symptoms requiring hospitalization to two of them, and adjuvant Temozolomide chemotherapy was held in all. One patient developed severe symptoms of shortness of breath requiring ICU-stay and expired eight days later. One patient was asymptomatic, tested positive during a routine pre-chemotherapy screening, and initiation of temozolomide was delayed by two weeks after a negative repeat test. All four symptomatic patients were rehabilitation facility residents. The most common lab abnormality was lymphopenia seen in 4/5 patients. Other abnormalities seen included elevated ferretin/total bilirubin/CRP/LDH/procalcitonin/D-dimer, thrombocytopenia/leukopenia, and low sodium/vitamin D. Chest x-ray findings were normal in 3/5 patients and showed ground glass opacities in 1 patient. COVID-19 screening during different phases of glioma therapy is recommended. Therapy interruptions or shortening duration of treatment particularly of temozolomide given its risk on lymphopenia may be needed. lymphopenia thresholds, MGMT promoter methylation status, and residence in rehabilitation facilities may help stratify glioma patient COVID-19 risks further. Patients and their family will need to be involved in therapies' risk:benefit discussions during this pandemic.

COVD-23. PLANNED-USE GLUCARPIDASE FOR OUTPATIENT HIGH DOSE METHOTREXATE (HD-MTX) ADMINISTRATION IN PATIENTS WITH CNS LYMPHOMA (CNSL) DURING THE COVID-19 PANDEMIC

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Infection with SARS CoV-2 virus has resulted in a global pandemic of COVID-19, a respiratory illness with a crude mortality rate of 3–4%. Risk of death is higher in the elderly and in patients with underlying comorbid conditions. When local incidence of COVID-19 is high, hospital resources are scarce and elective admissions and procedures are placed on hold. Patients with CNSL receiving first-line HD-MTX require admission for monitoring and aggressive hydration to prevent toxicity. This study explores the feasibility of planned-use glucarpidase, a recombinant bacterial enzyme that rapidly reduces serum MTX levels, to facilitate outpatient administration of HD-MTX. Eligible adult patients had isolated CNSL and had previously tolerated inpatient HD-MTX. MTX 3.5 g/m^2 was administered in the outpatient setting with hydration. Patients returned 24 hours after MTX administration for glucarpidase 2000u and additional hydration. MTX level was determined by high pressure liquid chromatography (HPLC) 48 hours following MTX administration. To date, seven outpatient HD-MTX treatments have been administered to a total of three patients. In all cases, MTX levels were reduced to < 100 nmol/L at 48 hours. Three treatments resulted in grade 1 elevation of AST/ALT (two patients). One treatment resulted in a grade 2 creatinine increase. Creatinine returned to baseline following additional outpatient hydration. No patients required hospital admission. This study demonstrates feasibility of outpatient HD-MTX administration with planned-use glucarpidase during the COVID-19 pandemic. We are currently