process of ‘rendering out’ Cancer Care and End of Life Care. Consortia are bidding for the two 10-year contracts with a combined value of £1.2 billion. We are working with all relevant parties to highlight the particular AHP needs of brain and CNS tumour patients.

DEVELOPMENT OF GLIOMA PRODRUGS WITH SITE-SPECIFIC ACTIVATION BY BIOORTHOGONAL PALLADIUM IMPLANTS

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As the effectiveness of surgery is limited by the risk of injury to normal brain tissue, improving the prognosis for patients diagnosed with malignant glioma will require novel therapeutic approaches. Over many years this has focused attention on drug discovery strategies to identify efficacious new agents, but without success. Our innovative approach is to focus on improving drug tolerance, permitting dose delivery and reducing side effects. The invention of drug-releasing devices implanted in a tumour cavity after surgery provides an opportunity to overcome the limitation on clinical doses of cytotoxic drugs due to unwanted side-effects. In the brain such a strategy delivers chemotherapy to the diseased area and circumvents the blood-brain barrier. However, to date such implants have suffered from problems such as limited carrying capacity and toxicity to the healing of surgical wound by the immediate release of chemotherapeutics after implantation at surgery. Our unique approach couples a prodrug with the use of a radio- and catalytic implant to trigger local release of cytotoxic agents. The prodrugs are rendered non-toxic by masking the functional-groups keys to its mode of action, then unmasked by the palladium in the implant. This approach has promise to decrease side-effects, increasing maximum therapeutic dose and could improve the pharmacokinetic properties of the drug, potentially increasing penetration across the blood-brain barrier. Furthermore, as our palladium device catalytically unmask the prodrug, the treatment course would not be limited by the lifetime of the implant and could be readily repeated in cases of recurrence. Our results in live cancer cells demonstrate that the cytotoxic activity of drugs can be switched off with our masking strategy and restored with the palladium implant, with no toxicity of the prodrug or implant alone. Ongoing in vivo experiments have also established that the palladium implant is biocompatible.

A ROLE FOR FGFR1 IN PAEDIATRIC GLIOMAS

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INTRODUCTION Paediatric high-grade gliomas (pHGGs) are highly invasive tumours associated with extremely poor prognosis. There is urgent clinical need to develop novel therapeutic strategies that can target the process of tumour migration and invasion. Fibroblast growth factor receptors (FGFRs) are unique unique receptor tyrosine kinases present in the non-tumour and in primary and haematoma requiring surgical evacuation. Brain swelling on imaging within 48 hours of surgery was noted in four patients. Only one patient experienced non-viable deaths; seven patients had new, non-resolving clinical deficits and a further four patients had new onset seizures. Only one patient experienced tumour-bed haematoma requiring surgical evacuation. Brain swelling on imaging was determined in 2 patients (2 = 11.578, p = 0.0031) was determined in the TMA sample set. There was a significant association of high FGFR1 levels with grade 2 and 3 astrocytomas. DISCUSSION: We report the presence of FGFR1 among low and high-grade paediatric gliomas and a role in cell migration after stimulation with ligand. Treatment with FGFR1 inhibitors may elicit a different effect on cell migration depending on tumour grade.

USE OF 18F-FDG-PET-CT IN GLIOMA SURVEILLANCE: A SINGLE CENTRE EXPERIENCE

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INTRODUCTION: Radiological surveillance in glioma surgery is primarily with MRI. Diffusing between disease progression and radiological decrease can be challenging. In our unit, in selected cases when there is suspicion of radiological recurrence, progression or to aid in differentiating progression from radionecrosis, we have augmented our surveillance with 18F-FDG-PET-CT. As such high uptake correlates with increased tumour activity. RESULTS: We identified 19 cases of PET imaging for glioma surveillance of whom we could assess 17 notes and images. Mean age was 45.06 (30–67) with male: female ratio 9:8. 15 /17 (88.2%) progressed surgery and 2 declined surgery (7 biopsy and 5 debulk and 2 declined surgery). Initial histology was pilocytic astrocytoma (1), grade II (4, 26.7%), grade III (6, 40%), GBM (3) and non-specific tissue (1). 5 patients had evidence of increased uptake on PET and all showed clinical progression, with only 3 clinically fit for surgery (histology showed 2 recurrence, 1 transformation). 10 patients had no increased uptake on FDG with a 4 on-going surveillance for an average of 8.5 years (7–12), 2 clinically progressed at 2 and 8 years after initial presentation at the point of PET imaging and received palliative chemotherapy, I had concurrent inoperable lung cancer and was palliated, 1 patient had transformation from gloma grade II - III, 1 had grade 2 histology, and 1 had only gliotic tissue on re-operation. CONCLUSIONS: A positive FDG PET has a positive correlation with disease progression and may be considered as an adjunct test in glioma surveillance.

THE IDENTIFICATION AND VALIDATION OF NOVEL APTAMERS FOR THE DIAGNOSIS OF OLIGODENDROGLIOMA

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Oligodendrogloma account for nearly 12% of brain tumours (Jan et al., 2017). In the United Kingdom, 0.4 people per 100 000 per year are newly diagnosed with oligodendrogloma (Croci et al., 2012). Early diagnosis and treatment of oligodendrogloma is essential as patients given the appropriate chemotherapy and radiotherapy treatment often live for many years longer than patients given radiotherapy alone (Cairncross et al., 2014). Aptamers are short, single-stranded nucleotide sequences (DNA or RNA) that uniquely fold to form specific recognition molecules that selectively bind to a molecular target. Aptamers against targets are generated using a process called systematic evolution of ligands by exponential enrichment (SELEX). Since 2002, a number of aptamers have been identified that can selectively identify cancerous cells. These aptamers have been used both diagnostically and therapeutically as a range of different cancers, however, there are currently no aptamers specific to glioma tissue. This first part of this project was to find aptamers specific to the grade IV glioblastoma cell line U87MG. Previous studies have found aptamers that were able to distinguish U87MG from non-malignant cell lines but showed good binding to most highly tumorigenic cell lines (Cerchia et al., 2009; Aptekar et al., 2015). To ensure that highly specific aptamers were identified, a large number of negative controls were utilised, and two variants of the SELEX process were undertaken to ascertain whether the negative controls had to be selected individually or if they could be pooled. Patient brain tumour samples were obtained from the Brain Tumour North West (BTNW) tissue bank and aptamers specific to oligodendrogloma will be selected. These aptamers will be used to screen patient samples to determine if they can identify oligodendrogloma tissue and be of use diagnostically, therapeutically and as a drug delivery tool.

SURGERY FOR BRAIN TUMOURS WITHOUT DEPLOYING HANDHELD OR SELF-RETAINING RETRACTION SYSTEMS

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OBJECTIVE: To assess utility of not deploying retractor systems during radical surgery for parenchymal and intraventricular brain tumours and to analyse its effect on post-operative complications and extent of resection. DESIGN: Gross total resection (GTR) was attempted in all patients. Neuronavigation and intra-operative imaging was utilised as necessary. Endoscopic surgeries, stereotactic burr-hole biopsies or aspirations were excluded. Patients did not receive anti-oxidant drugs in peri-operative period. Antiinflammatories were administered only if patient had pre-operative headache or inflammation on MRI. One patient underwent post-operative evaluation immediately after surgery and 12 hourly intervals for three days. All patients had imaging within 48 hours of surgery to assess tumour-bed haematoma, cerebral swelling and extent of resection. SURGERY: Consecutive 36 patients of intraventricular and intraventricular tumours operated from 2010–15 period at a tertiary referral Institution by the Brain Tumour North West (BTNW) tissue bank and aptamers specific to oligodendrogloma will be selected. These aptamers will be used to screen patient samples to determine if they can identify oligodendrogloma tissue and be of use diagnostically, therapeutically and as a drug delivery tool.

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