

# The prevalence of hypopituitarism and its evaluation following traumatic brain injury

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## Neurosurgery

### 0065: WHAT IS THE ORIGIN OF 'CANCER STEM CELLS' IN GLIOBLASTOMA MULTIFORME?

Yizhou Wan<sup>\*,1</sup>, Albert Wong<sup>2</sup>. <sup>1</sup>Imperial College London, UK; <sup>2</sup>Stanford University, California, USA.

**Introduction:** The median survival of GBM is abysmal, at approximately 10 months. There has been increasing evidence to demonstrate that GBM development may follow a CSC model. Epidermal Growth Factor Receptor variant III (EGFRvIII) termed LEEK, is produced from a loss of exons 2–7 of the EGFR gene. Trials of an anti-EGFRvIII vaccine in GBM patients demonstrate improved survival and stimulation of a specific anti-EGFRvIII immune response.

**Methods:** The potential role of EGFRvIII in promoting CSC formation was investigated. Mouse fibroblasts were transformed into induced pluripotent stem cells through lentiviral transfection of 'Yamanaka factors'. EGFRvIII was cloned using plasmid vectors. The tumoursphere forming capabilities of EGFRvIII+ iPSCs was compared with EGFRvIII- iPSCs by estimating cell mass and viability using optical densitometry.

**Results:** There was no difference in tumoursphere formation between EGFRvIII+ and EGFRvIII- iPSC cells as measured by fluorescence. Comparison of the relative difference between the  $-/+$  EGFRvIII activated and inactivated cells for higher concentrations showed that EGFRvIII+ cells showed a higher OD which may reflect a higher concentration of cells due to increased CSC formation.

**Conclusions:** Future work should focus on limiting-dilution assays or single-cell counting methods such as flow-cytometry. Furthermore, stem-associated mRNA transcription can be quantified with RT-PCR.

### 0107: THE PREVALENCE OF HYPOPHYSECTOMY AND ITS EVALUATION FOLLOWING TRAUMATIC BRAIN INJURY: EVIDENCE FOR EARLY SCREENING TOOLS

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**Introduction:** To determine the prevalence of pituitary dysfunction following traumatic brain injury (TBI) and evaluate its assessment.

**Methods:** Data were retrospectively collected on 104 patients admitted to the Wessex Neurological Centre with TBI over 1-year. An electronic TBI database and patient notes were reviewed for endocrinological tests performed, results and deficiencies identified.

**Results:** Only 37.5% (n=39) of patients were assessed for any form of pituitary dysfunction. On average, these assessments only covered 1.9 of 6 clinically relevant pituitary hormones per patient. Of patients tested, 53.8% (n=21) were found to have pituitary dysfunction. ACTH deficiency was found in 47.6% (n=10), diabetes insipidus in 47.6% (n=10), TSH deficiency in 14.3% (n=3). One patient had low gonadotrophins. One case of growth hormone deficiency was noted. Three patients had multiple deficiencies.

**Conclusions:** Only a minority of patients are assessed for hypopituitarism following TBI. Assessments that do occur have inadequate scope. In those assessed, the prevalence of hypopituitarism is high, with multiple hormones affected in some. This may reflect selection bias, if testing is based on clinical suspicion. Given this high prevalence, we recommend the development of screening tools for early detection of pituitary dysfunction following TBI. The relevance of early testing will be discussed.

### 0370: IMPLEMENTATION OF A PRO FORMA FOR NEUROSURGICAL ADMISSIONS – A COMPLETE AUDIT CYCLE

Justice Reilly<sup>\*</sup>, Douglas Stewart, Mario Teo, Nigel Suttner. *Institute of Neurosurgical Sciences, Glasgow, UK.*

**Introduction:** Admission documentation is essential for the neurosurgical patient where baseline neurological status guides on-going management.

**Methods:** An initial audit was conducted to assess irregularities in admission details recorded in patient notes. Thirty history, examination and investigation parameters were retrospectively reviewed in 50 consecutive elective and emergency admissions to the Institute of Neurosurgical Sciences, Glasgow. This highlighted less than 50% documentation in 10/30 parameters including Blood results (26%), CJD risk (0%), GCS (44%) and Cerebellar examination (10%).

**Results:** Following implementation of the admission pro forma booklet, only 6/30 parameters were documented in less than 50% of notes, with particular improvement in neurological findings; GCS (89%), Cranial Nerves (100%), Limb power (100%), Cerebellar examination (53%). The audit was repeated 2 years later and demonstrated sustained improvement in documentation, again with only 6/30 parameters having < 50% documentation. CJD risk (20%) recreational drug use (36%), abbreviated mental test (2%) and resuscitation status (2%) remained poor. Patient Observations (44%) and Blood Results (34%) were routinely not available to the admitting surgeon, which explains this shortfall.

**Conclusions:** The pro forma provided an efficient framework for clerking patients with sustained success, with the added advantage of being readily found in the notes in the case of acute deterioration.

### 0599: THE ACCURACY OF CLINICAL CODING OF INTRA-AXIAL BRAIN TUMOUR RESECTIONS

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**Introduction:** We aim to audit the Healthcare Resource Group (HRG) code assigned to intra-axial brain tumour resections to ensure a level of reimbursement commensurate with the service provided towards patient care.

**Methods:** All patient episodes generating HRG codes of 'AA12Z' between January and June 2012 inclusive were extracted. Only cases involving intra-axial tumour resections were included. The pre and post op scans were reviewed; the radiology reports and operation notes were examined to determine extent of resections.

**Results:** 99 cases were extracted in total. 39 cases were excluded (pituitary, biopsies, shunts, lipoma, dermoid cyst, meningioma, intracerebral haemorrhage). Of the 60 cases involving intra-axial tumour resections, 25 were coded incorrectly as they involved resections in more than 1 lobe. One 'single-lobed' case was incidentally found to have been missed off this HRG list.

**Conclusions:** The difference in reimbursement between AA12Z (single-lobed resection) and AA06Z (multi-lobed resection) is £650. Hence, the shortfall in reimbursement for this particular area is estimated to be £16250, or about £32500 a year. A set of tick-boxes was introduced into the operation note proforma. Subsequent reaudit showed 100% accuracy in a 1 month period. This audit will be extended to other procedures, in light of our incidental finding.

### 0633: AUDIT OF ADHERENCE TO NICE GUIDELINES IN THE MANAGEMENT OF PAEDIATRIC HEAD INJURIES

Sarah Braungart<sup>\*,1</sup>, Jacqueline Reaper<sup>2</sup>, Gerry M. O'Reilly<sup>2</sup>. <sup>1</sup>Yorkshire and Humber Deanery, Yorkshire, UK; <sup>2</sup>Hull and East Yorkshire NHS Trust, Hull, UK.

**Introduction:** Traumatic brain injury is a major cause of death and disability in children. We aimed to establish if CT scans requested for paediatric head injuries and admission of children following head injury were indicated by NICE guidelines.

**Methods:** Retrospective review of electronic patient records and case notes.

**Results:** Included: all patients <16 years presenting to our Emergency Department who underwent CT head for isolated minor head injury (GCS14–15, no focal deficits) over 6 month period. 79 patients identified (57 boys, 22 girls), median age 6years (range 5m–15y7m). Most common indications for CT: >3 episodes of vomiting (40), dangerous mechanism of injury (19), amnesia >5min (14). 8 CT scans were not indicated by NICE guidelines. 71/79 CT scans were normal. 6 showed skull fracture, 2 showed intracranial bleed. 56/79 patients were admitted (53 under Neurosurgery). Most common reason for admission in children with normal CT was "continuing source of concern" (22), mainly ongoing vomiting. 13 patients had no clear reason for admission.

**Conclusions:** 8 children underwent CT scan without obvious indication; all of these CTs were normal. 13/45 children admitted with normal CT did not meet NICE criteria for admission. By applying NICE criteria more rigidly, we could reduce number of children scanned and number of admissions.

### 0650: ENDOSCOPIC MANAGEMENT OF THIRD VENTRICULAR COLLOID CYSTS

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