

## ISNACC-S-06

**An analysis of intraoperative ultrasound-guided gross total resection in glioblastoma multiforme****Surg C dr Vidhu Bhatnagar, Surg Cmde K I Mathai, Surg Cdr Vimal Vibhakar**

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**Background:** Glioblastoma multiforme (GBM) constitutes 50% of gliomas and is the most common and lethal primary tumour of the central nervous system. The lifespan of a patient without treatment is only about 6 months. Treatment protocols include surgical resection followed by radiation and chemotherapy. The extent of surgical resection has a direct bearing on life expectancy and quality of life. At our centre, we used intraoperative ultrasound guidance for tumour resection. **Methodology:** A retrospective, descriptive analysis of 22 consecutive GBM patients for recurrence-free survival managed at the neurosurgical centre of our tertiary care institute, from September 2014 to September 2015. Pre- and post-surgery computed tomography scans helped analyse the extent of resection. **Results:** Five of the eight frontal GBM's, four of eight temporal GBM's and two of the four parietal GBM's underwent gross total resection of tumour as confirmed by post-operative imaging. No permanent neurological deterioration persisted for more than 3 weeks even after gross total resections close to eloquent regions. A minimum period of 6 months follow-up was achieved in all patients in this series. There was no operative or perioperative mortality in this cohort. Nine of the 11 patients who underwent gross total resection did not manifest tumour recurrence at 6 months of follow-up. Five of the nine patients who underwent subtotal resections were symptomatic with headaches and developed radiological evidence of tumour progression within a 6 month period. **Discussion:** Glioblastomas were believed to originate from malignant transformation of differentiated glial cells. Conventional treatment includes maximal safe surgical resection followed by radiotherapy with concurrent and adjuvant temozolomide. Tumour recurrence is early and inevitable and often occurs within the radiation field. The aim of surgery is to achieve maximal excision without producing a debilitating deficit. Aids to maximal excision include intraoperative fluorescein staining of tumours and intraoperative magnetic resonance imaging. In our study, gross total resection was achieved using ultrasound guidance intra-operatively which correlated with longer recurrence-free survival.

## ISNACC-S-07

**Pulsatility index correlates with opening intraventricular intracranial pressure****Narender Kalaria, Nidhi Bidyut Panda, V. K. Grover, Hemant Bhagat, Rajesh Chhabra<sup>1</sup>, Shiv Soni, Rajeev Chauhan**Departments of Anaesthesia and Intensive Care and <sup>1</sup>Neurosurgery, Post Graduate Institute of Medical Education and Research, Chandigarh, India

**Background:** Increased intracranial pressure (ICP) is life-threatening complication of a variety of neurologic insult. Various non-invasive methods have been employed to estimate ICP, transcranial Doppler (TCD) is one of them. Increase ICP leads to decrease in diastolic flow velocity (FV) and mean FV in major intracranial vessels resulting in increase in pulsatility index (PI) derived by TCD. Hence, the present study was designed to find a correlation between TCD derived PI with opening intraventricular ICP. **Methodology:** A prospective, observational, double-blinded study was conducted in Post Graduate Institute of Medical Education and Research, Chandigarh. Thirty-two patients of age 8–60 years with clinical features of raised ICP posted for endoscopic third ventriculostomy or ventriculoperitoneal shunt were enrolled after getting Institute Ethics Committee clearance and written informed consent from patient's kin. A 2 Mz probe of TCD was insonated through temporal window to measure FV in middle cerebral artery (MCA) pre-operatively, and PI was calculated. A standard anaesthesia protocol was followed in all cases. Opening intraventricular ICP was measured through a ventriculostomy catheter inserted into lateral ventricle and pressure measured without loss of cerebrospinal fluid. Spearman correlation test was used to correlate PI with intraventricular ICP. Receiver operating characteristic curve was drawn at different values of ICP to find out the corresponding PI. **Results:** MCA FV was measured by TCD in all 32 patients. The systolic and mean velocity varies from 69.3–144 cm/s to 25–89.3 cm/s, respectively. The opening intraventricular ICP values ranged from 9 to 44 mmHg. PI had a strong significant positive correlation with intraventricular ICP. At ICP cut-off value of 20 mmHg, PI was  $\geq 0.92$  (70.6% sensitivity and 66.6% specificity;  $P = 0.009$ ). **Discussion:** PI correlates well with opening intraventricular ICP, so it can be used to diagnose intracranial hypertension and guide ICP reduction therapy.

## ISNACC-S-08

**An observational study comparing the recovery time in patients receiving additional anticonvulsant dose versus those receiving regular dose during supratentorial craniotomy****Rosen Roy Mathew, Ramamani Mariappan**

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**Background and Objectives:** Additional dose of anticonvulsants are administered during supratentorial craniotomy. It has impact on recovery time, haemodynamics and depth of anaesthesia. Our study compared the recovery time in patients who received additional anticonvulsant with those who received the regular dose during craniotomy. **Patient and Methods:** After the Institutional Review Board approval, the study was carried out in 36 patients who underwent supratentorial craniotomy. Patients were divided into two groups; Group 1: Regular dose, Group 2: Additional dose. Patients were anaesthetised using standard anaesthesia protocol. Anticonvulsant was administered during craniotomy, and the haemodynamics and changes in bispectral index were noted during and 1 h after administration of the anticonvulsant. Plasma anticonvulsant levels were measured before and after craniotomy. Extubation time, time to open eyes, obeys commands and orientations were noted. Patients were followed up for 48 h to note the occurrence of seizures. **Results:** Of 36 patients, 19 patients received regular dose; 17 received an additional dose. Age, sex, weight, tumour location and tumour pathology, dose of propofol, fentanyl administered were comparable between the two groups. There was no significant difference in recovery time between the two groups as they were analysed as additional versus regular dose. However, the subgroup analysis showed significant delay in recovery especially, time to obey commands (>15 min) and time to get orientation (>1 h) in patients who received additional dose of phenytoin. Although these differences looked clinically very significant, it was not statistically significant because of smaller sample size. Plasma anticonvulsant levels had significantly dropped in patients who received regular dose ( $P=0.004$ ). There was a positive correlation between intravenous fluid administered and drop in plasma anticonvulsant level. Five patients had post-operative seizures, of which four had pre-operative seizure. There was no correlation with post-operative plasma anticonvulsant levels and occurrence of post-operative seizures. **Conclusion:** Administration of additional dose of phenytoin causes delays the recovery and causes haemodynamic fluctuations. Administration of additional dose of sodium valproate did not affect either the recovery time or the haemodynamics. The presence of pre-operative seizures is one of the significant risk factors for developing post-operative seizure. Due to the small sample size, it is very difficult to comment on the occurrence of post-operative seizures and the plasma anticonvulsant level. This warrants larger randomised control trials to see the correlation statistically.

ISNACC-S-09

**Quantitative analysis of changes in cerebral oxygenation during induction of anaesthesia and in different positions in spine surgery using near-infrared spectroscopy**

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**Background:** The primary goal in the haemodynamic management of patients undergoing surgery is to preserve adequate oxygen delivery. Techniques to monitor cerebral oxygen status would be especially useful for patients who are at increased risk for cerebral ischaemia in specific surgical procedures, pathophysiological conditions or positions. Near-infrared spectroscopy (NIRS) is a non-invasive, bedside monitor that provides reliable and real-time data of cerebral oxygenation ( $rSO_2$ ) by integrating arterial, venous and capillary blood within the field of view. We conducted a prospective observational study to evaluate the changes in  $rSO_2$  at anaesthesia induction and in different positions in patients undergoing spine surgery using NIRS. **Methods and Materials:** Thirty-two patients undergoing spine surgery in prone position were studied using NIRS. Cerebral tissue oxygenation was measured in various positions at different fixed time intervals before and after induction of anaesthesia. Haemodynamic parameters were also noted and appropriate statistical methods used to find a correlation between  $rSO_2$  measured by NIRS and haemodynamic parameters at various intervals and positions. **Results:** Significant difference in NIRS values was observed on either side (left - 69.19, right - 67.81). We observed a 7% increase in NIRS values after pre-oxygenation. There was a significant decrease in NIRS values at 5 min after induction on placing the patient in reverse trendelenburg and prone positions as compared to supine position. On evaluating NIRS values over a period after prone positioning, we found a significant decrease at 60 min as compared to baseline (4.8% on left and 4.3% on right). Change in NIRS also had a significant correlation with change in heart rate, oxygen saturation and mean arterial pressure. **Conclusion:** Maintaining  $rSO_2$  during surgery and anaesthesia is of paramount importance. It is clear from our study that  $rSO_2$  significantly reduces when the patient is placed in prone position. Change in NIRS needs to be observed in long duration surgeries before it is directly correlated with duration of surgery in certain positions.

ISNACC-S-10

**Effect of stellate ganglion block in cerebral vasospasm as assessed by digital subtraction angiography**

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