

with pacemaker in situ and anaesthetic implications are crucial. We report a successful anaesthetic management of a patient with pacemaker for frontal lobe tumor excision under general anaesthesia. **Case Summary:** 64 year old female with complaints of headache and irrelevant speech since 2 weeks, diagnosed to have frontal lobe tumor. Patient had history of syncope 5 years back and was diagnosed to have complete heart block. Thus a permanent pacemaker with VVI synchronised mode with heart rate 70/min was placed. On examination patient was moderately built, drowsy, heart rate was 68/min and rest vitals were within normal limits. Blood investigations were within normal limits. ECG showed pacemaker spikes just before QRS complexes and LVH. 2D Echo showed pacemaker lead in right ventricle and rest findings were normal. Patient accepted for surgery under ASA grade III with appropriate consent. Preoperatively central line was secured. Facility for temporary pacing and pacemaker technician were kept ready. Pacemaker settings were programmed from VVI mode to VVO mode. Patient was premedicated and induced with inj. thiopentone and inj. rocuronium, intubated and ventilated. Intraoperative vitals were maintained within normal limits. At the end of surgery patient was drowsy but maintained SpO<sub>2</sub> 100%. ET tube was kept in situ and patient was put on CPAP mode. VVO mode reprogrammed to VVI mode. Patient shifted to surgical ICU, all investigations were within normal limits. Patient was extubated in SICU 6 hours postoperatively. **Conclusion:** Neurosurgical patient with permanent pacemaker poses a real challenge to an anaesthetist. Thorough pre-op evaluation and team work of anaesthetists, physician and surgeon resulted in successful outcome.

#### ISNACC-S-32

##### Evaluation of prognostic factors of outcome in severe traumatic brain injury patients following decompressive craniectomy

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**Introduction:** Severe traumatic brain injury (TBI) is leading cause of death and disability globally. Decompressive craniectomy (DC) is done to treat severe brain edema. We conducted a study to determine predictive factors for prognosis of DC at the time of cranioplasty. We correlated the admission variables, CT scan findings and timing of d/c, hospital stay with functional outcome. **Methods:** The functional outcome was noted prospectively and retrospective admission data was obtained from hospital records. All consenting

patients (15-65 yrs) posted for cranioplasty following DC due to severe TBI were enrolled. The data including Marshall grading, admission Glasgow coma score (GCS), mean arterial pressure (MAP), time of DC, duration of hospital stay, hospital readmission and GCS at discharge. The functional outcome at the time of cranioplasty was measured by Glasgow Outcome Score (GOSE) questionnaire. GOSE 5-8 were classified as good outcome and GOSE 1-4 were classified as poor outcome. **Results:** A total 85 patients (71 male and 14 female) were enrolled. The mean age was 33.42 yrs. Only 36% patients had a good outcome (GOSE 5-8). There was no significant association between age, sex, marshall grading, duration between d/c and cranioplasty, hospital readmission, GCS at admission with outcome. In univariate analysis tracheostomy, duration of hospital stay, MAP, timing of DC and GCS at discharge were predictors of outcome. On multivariate analysis tracheostomy was found to be independent predictor of outcome. **Discussion:** Significant disability is seen among the survivors of DC. Admission variables do not predict outcome. Larger sample size is required.

#### ISNACC-S-33

##### Non-neurosurgical complications in traumatic neurosurgical ICU patients: A prospective observational study

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**Introduction:** Recognising and treating non-neurological complications occurring in neurotrauma patients during ICU stay is equally challenging. Primary aim: To estimate various non-neurological complications in neurotrauma patients. Secondary aim: To see the effect of these complications on ICU stay, disability and mortality. **Methods:** Prospective observational study at neurotrauma ICU of level 1 trauma center, AIIMS, New Delhi. 200 neurotrauma patients consisting of Traumatic Brain Injury (TBI) and/or Cervical spine injury (CSI) were enrolled. Period of study: From admission to discharge from ICU or demise. Inclusion criteria: Age >16 years, Severe TBI (GCS≤8), CSI requiring mechanical ventilation. **Results:** Non-neurological complications were frequent in neurotrauma ICU patients. We observed respiratory complications to be of highest occurrence (60.5%). Other complications in decreasing order included dyselectrolytemia (40%), cardiovascular (33.5%), coagulopathy (32%), sepsis (24%), abdominal (16.5%) and AKI (3.5%). Presence of systemic

complication except AKI was found to be significantly associated with increased ICU stay. Most of the patients of AKI died early in ICU. Respiratory dysfunction was found to be independently associated with 3.05 times higher risk of worsening clinical condition (disability) ( $p < 0.018$ ). Presence of hypotension during ICU stay (4.2 times,  $p < 0.005$ ), AKI (24.7 times,  $p < 0.02$ ), Coagulopathy (3.13 times,  $p < 0.047$ ) and GCS  $< 6$  patients (4.2 times,  $p < 0.006$ ) of TBI were independently associated with significantly increased risk of ICU mortality. **Conclusion:** Neurotrauma patients tend to have poor outcome due to concomitant non-neurological complications. These have significant bearing on ICU stay, disability and mortality. Early diagnosis and prevention can improve the overall outcome and shorten their ICU stay.

#### ISNACC-S-34

##### Effect of perioperative hyperglycemia on neurological outcome in aneurysmal subarachnoid hemorrhage

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**Introduction:** Hyperglycemia is associated with delayed cerebral ischemia and cerebral infarction in patients with aSAH (aneurysmal subarachnoid hemorrhage). We planned to assess prevalence, predictors of perioperative hyperglycemia and its effect on outcome. **Methods:** A prospective observational study was carried out in 150 patients with aSAH for clipping. Blood sugar levels at admission, intraoperative and postoperative period were assessed. RBS  $> 160$  mg/dl and RBS  $> 200$  were considered as hyperglycemia and severe hyperglycemia respectively. Persistent hyperglycemia was defined as hyperglycemia during any 2 of 3 study periods (preoperative, intraoperative and postoperative periods) and transient hyperglycemia was defined as hyperglycemia during any one study period. Predictors of hyperglycemia and its effects on outcome was measured by number of ICU, hospital days, GOS and mortality at 1 and 3 months after discharge were assessed. **Results:** Two patients were excluded due to incomplete data and statistical analysis was carried out in 148 patients. Prevalence of perioperative hyperglycemia and severe hyperglycemia was 75.7% and 27%. Prevalence of persistent hyperglycemia and persistent severe hyperglycemia was 37.83% and 7.43%. The predictors of hyperglycemia in patients with aSAH were identified by multivariate logistic regression. History of DM, high RBS at admission, high MAP at admission, longer duration surgery and anaesthesia were predictors of perioperative and persistent hyperglycemia. Perioperative hyperglycemia were

associated with increased ICU days ( $p \leq 0.007$ ), hospital days ( $p \leq 0.038$ ) and poor GOS at 1 and 3 months after discharge. At three months follow up 47.5% patients with perioperative severe hyperglycemia and 54.54% patients with persistent severe hyperglycemia and transient severe hyperglycemia ( $p = 0.002$ ) had poor outcome (GOS-1-3). **Conclusion:** Hyperglycemia is a potentially modifiable risk factor which is significantly associated with poor outcome after aSAH.

#### ISNACC-S-35

##### A comparison of the effect of 0.9% saline versus balanced salt solution (plasma-lyte a) on acid base equilibrium, serum osmolarity and serum electrolytes in supratentorial neurosurgical procedures requiring craniotomy

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**Introduction:** The most commonly used isoosmolar fluid in neurosurgery is 0.9% saline (308 mosm/L) which has a high chloride content (154 mmol/L), and is known to produce acidosis. Balanced salt solutions, e.g. Plasmalyte A, are isoosmolar (294 mosm/L), contain additional electrolytes, have less chloride content (98 mmol/L) and are stated to produce less acid base disturbances. Our aim was to study the effects of plasma-Lyte A (Baxter healthcare (India) pvt Ltd.) on acid base balance, serum osmolarity and serum electrolytes in neurosurgical procedures. **Methods:** In this prospective study, 70 Subjects were randomly allocated to two groups, to receive either 0.9% saline as the sole intravenous fluid (Group N) or Plasma-Lyte A (Group P). Arterial Blood Gas Samples were analysed at regular intervals and the variables noted were: serum osmolarity, pH, base deficit or excess, chloride, lactate, sodium, potassium, calcium, and glucose levels. The data was analysed statistically by student's T test (continuous) and chi-square test (categorical) using NCSS software version 9.0. **Results:** Towards the end of the surgery, pH was found to be low in the normal saline group ( $7.334 \pm 0.05$  and  $7.275 \pm 0.05$ ) as compared to the plasmalyte group ( $7.402 \pm 0.03$  and  $7.406 \pm 0.03$ ), this difference being statistically highly significant ( $p < 0.0001$ ). The difference in base deficit was also highly significant at the same time intervals. (Group N  $-2.474 \pm 1.169$  and  $-3.682 \pm 2.12$ , Group P  $-1.046 \pm 0.831$  and  $-1.438 \pm 1.093$ ,  $p < 0.0001$ ). Chloride levels were significantly higher in the normal saline group at different time intervals ( $112.8 \pm 8.002$  and  $102.57 \pm 6.17$ ), ( $115.77 \pm 9.84$  and  $103.63 \pm 5.2$ ) and ( $117.194 \pm 10.7$  and  $103.15 \pm 4.95$ ) ( $p$  value  $< 0.0001$ ). Serum electrolytes and serum osmolarity were found to be comparable in both