Table 1: Quality of emergence scale (minimum - 5, maximum - 20)

Emergence parameter	MAP (rise from baseline) (%)	Cough	Agitation	Consciousness
4	<10	No cough	Calm	Responds to name spoken in normal tone
3	10–20	Single episode	Restless	Responds to name spoken in loud tone
2	20–40	1 episode, <5 s	Agitated	Responds to shaking
1	>40	1 episode, <5 s	Very agitated	Does not responds

MAP: Mean arterial pressure

Table 2: Results

Demographics	Group I	Group I	*P*
Age	36.64±12.35	40.27±12.42	0.34
Gender (male:female)	10:12	16:6	0.12
Weight	68.59±13.75	68.70±11.81	0.978
ASA I:II	10:12	9:13	1.00
Intra-operative data			
Propofol (in mg)	98.64±28.99	97.73±23.49	0.91
Fentanyl (in µg)	221.14±50.28	220.45±45.92	0.96
Fluid (in ml)			
Duration of surgery (in min)	75.00±22.78	68.18±21.24	0.31
Duration of anaesthesia (in min)	125.68±28.71	118.18±26.30	0.37
Emergence			
Time to emergence (min)	9.77±3.05	9.18±2.08	0.46
Time to extubation (min)	11.68±3.68	10.64±2.95	0.30
Emergence score	13.45±1.654	18.05±1.17	0.00
$SjvO_2$ (%)	85.53±7.42	76.30±8.77	0.001

ASA: American Society of Anesthesiologists, $SjvO_2$: Jugular venous oxygen saturation

ISNACC-S-03

Electrophysiologic identification of Broca's area during frontal lobe tumour surgeries

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Introduction: Intraoperative mapping of language function assumes importance in patients undergoing resection of tumours in proximity to Broca's area. Optimal stimulation protocol for effecting a speech arrest is challenging because of the risk of seizure due to high frequency, long duration electrical stimulation in awake subjects. We report a case series to present our experience with an improvised protocol for direct cortical electrical stimulation for language mapping. **Methods:** A total of three cases of language mapping have been carried out since the inception (i.e., about 1 month) of neurophysiological monitoring services in our institute. All the patients (two female and one male) had tumours close to the anatomical Broca's area as determined by pre-operative magnetic resonance imaging (MRI). In one patient, a functional MRI confirmed the same. All were right-handed. Baseline assessment of language function revealed deficits in all the patients. Awake craniotomy was carried out under neuron avigation guidance. Verbal fluency and object recognition tasks were carried out. Stimulation protocol consisted of 1000 ms duration electrical pulse of biphasic polarity presented at 60 Hz for 7 s, repeated intermittently. **Results:** All patients had language area in the left cerebral hemisphere. Using this stimulation protocol, a current, as small as 5 mA, caused speech arrest and defined the expressive language area. No patient developed intraoperative seizure or did anyone develop new language deficit post-surgery. **Conclusion:** Our limited experience suggests that our language mapping stimulation protocol has been effective in causing speech arrest without inducing

seizures during awake craniotomy for frontal lobe surgeries. Intraoperative language mapping should be considered as the standard of care in such surgeries.

ISNACC-S-04

Attenuation of haemodynamic responses to skull clamp application in neurosurgeries: A comparative study of the efficacy of intravenous esmolol versus dexmedetomidine

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Background: Skull clamp application is routine in craniotomies to position and fix the head. It is a noxious stimulus and is associated with increased haemodynamic and neuroendocrine responses. Various drugs are used to attenuate haemodynamic responses to skull clamp application. We compared the efficacy and safety of selective beta-blocker esmolol and alpha-2 agonist dexmedetomidine to attenuate haemodynamic responses to skull clamp application. **Methodology:** Eighty patients (American Society of Anesthesiologists I and II) scheduled for elective neurosurgeries were enrolled in the prospective double-blinded randomised study. The patients were randomly assigned to two groups. After securing intravenous line, Group D patients received dexmedetomiditine 0.5 mcg/kg/h continuous infusion and Group E patients received esmolol 0.5 mg/kg/h continuous infusion. General anaesthesia was given with routine monitoring. Infusions were stopped after 10 min of skull clamp application. Haemodynamic parameters were monitored at regular time intervals till 10 min of skull clamp application. Propofol was used if required to keep target mean arterial pressure (MAP) to 55–65 mmHg or 20% reduction of blood pressure from baseline value in both groups. Any side effects were noted. The results were analysed with Chi-square test, Mann–Whitney U-test and paired *t*-tests. **Results:** Haemodynamic parameters were highest after 1 min of skull clamp application in both the groups. In Group D, MAP and heart rate (HR) were 97 ± 9 mmHg and 98 ± 16/min, respectively, at 1 min after skull clamp application. Similarly, in Group E, MAP and HR were 98 ± 13 mmHg and 94 ± 18/min, respectively. Only 12 patients in Group D required propofol at skull clamp application as compared to 32 patients in Group E ($P < 0.001$). There were no side effects in both groups. **Discussion:** We conclude that dexmedetomidine infusion is better compared to esmolol in attenuating haemodynamic responses to skull clamp application. We did not compare neuroendocrine responses to skull clamp application, which is limitation of this study.

ISNACC-S-05

Evaluation of electrocardiographic and echocardiographic changes in head injury patients before and after surgery

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Background: Cardiac manifestations such as electrocardiographic (ECG) and echocardiographic changes are well known after acute brain injuries. These changes are most widely studied in aneurysmal subarachnoid haemorrhage but in traumatic brain injuries, there are few case reports or retrospective studies. None of the previous studies had assessed the effect of surgery on these changes. Hence, we planned to evaluate ECG and echocardiographic changes before and after surgery in the patients with isolated acute head injury undergoing surgery. **Methodology:** This prospective observational study was commenced after obtaining Institutional Ethics Committee approval. Totally, 60 patients with isolated head injury undergoing surgery were enrolled. Patients with history of premorbid cardiac disease and electrolyte abnormalities were excluded. First, ECG and echocardiography were obtained within 6 h of admission to the emergency room and second, evaluation was performed after 12 h post-operatively. **Results:** Of 60 patients, ECG abnormalities were observed in 37 (61.66%) patients pre-operatively and it decreased to 8 (13.33%) patients post-operatively ($P = 0.0001$). Pre-operative ECG changes include QTc prolongation (17, 28.33%), rhythm abnormalities (16, 26.66%), ST changes (12, 20%) and T-wave changes (7, 11.66%). It decreased to 4 (6.66%; $P = 0.001$), 0, 4 (6.66%; $P = 0.008$) and 1 (1.66%; $P = 0.031$), respectively after surgery. Only one patient developed regional wall motion abnormality (midventricular and apical hypokinesia) on echocardiography (1.67%) that improved immediately after surgery. **Discussion:** We conclude that the incidence of ECG changes is 61.66%, and echocardiographic changes are 1.67% in our study. Most of the changes both benign and malignant reversed significantly after decompression. Hence, we should focus on treating intracranial pathology even in the presence of cardiac changes. Only life-threatening arrhythmias need immediate attention. There are a few limitations in the study such as small and heterogeneous sample size.