

The use of dexmedetomidine is in increasing trend particularly in patients with neurological disorders. A very few studies have focused on the cerebral haemodynamic effects of dexmedetomidine. This study is aimed to address this issue. **Methods:** Thirty patients without any intracranial pathology were included in this study. Middle cerebral artery flow velocity (FV) obtained from transcranial colour Doppler was used to assess the cerebral haemodynamic indices. Mean FV (mFV), pulsatility index (PI), cerebral vascular resistant index (CVRi), estimated cerebral perfusion pressure (eCPP) and zero flow pressure (ZFP) were calculated bilaterally at baseline and after infusion of injection dexmedetomidine 1 mcg/kg over 10 min. **Results:** Twenty-six patients completed the study protocol. After administration of loading dose (LD) of dexmedetomidine, mFV and eCPP values were significantly decreased in both hemisphere ($P < 0.05$); PI, CVRi and ZFP values showed significant increase ($P < 0.05$) after dexmedetomidine infusion. **Conclusion:** Increase in PI, CVRi and ZFP suggests that there is possibility of increase in distal CVR with LD of dexmedetomidine. Decrease in mFV and eCPP along with increase in CVR may lead to decrease in cerebral perfusion. This effect can be exaggerated in patients with pre-existing neurological illness. Further studies are needed to evaluate the effect of dexmedetomidine on various other pathological conditions involving brain such as traumatic brain injury and vascular malformations.

ISNACC-S-27

Cerebral oxygenation during electroconvulsive therapy

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Background: Near-infrared spectroscopy is a novel monitor to detect cerebral oxygenation (rSO_2). A very few studies have analysed the effect of electroconvulsive therapy (ECT) on rSO_2 . We hypothesised that atropine pre-medication related activation of systemic and cerebral haemodynamics will exacerbate ECT-induced increase in rSO_2 . This study aimed to assess the effect of atropine and no atropine pre-medication during ECT on rSO_2 and correlate this with haemodynamics and peripheral oxygen saturation. **Methodology:** Psychiatric patients aged between 18 and 60 years requiring modified ECT for their illness were included in this 6-month study. This was a randomised crossover trial, in which patients served as their own controls. For the second ECT session, patients were randomised to receive either 0.01 mg/kg atropine or no atropine preceding anaesthesia.

Anaesthesia was induced by thiopentone 3 mg/kg and muscle relaxation was achieved with suxamethonium 0.5 mg/kg. For the third ECT, the patients were crossed over. Heart rate, blood pressure, SpO_2 and rSO_2 values were recorded at baseline and every 15 s from ECT stimulus till 5 min. **Results:** Data from 41 patients were analysed. There was no difference in baseline rSO_2 in patients with different psychiatric diagnoses. rSO_2 increased consistently in both groups after ECT which did not return to baseline at 5 min. Increase in rSO_2 was independent of increase in blood pressure. rSO_2 was lower in patients who developed desaturation during ECT. **Discussion/Conclusion:** On the contrary, no immediate desaturation after ECT stimulus was seen. rSO_2 increased consistently following ECT in both the groups. Systemic desaturation resulted in lower rSO_2 . Future studies should investigate whether rSO_2 changes associated with therapeutic seizures contributes to post-ECT cognitive changes.

ISNACC-S-28

Evaluation of usefulness of a point of care haemoglobin device in emergency neurosurgery

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Introduction: Blood transfusion and anaemia in traumatic brain injury adversely affect the outcome and also increase length of stay and mortality. Laboratory haemoglobin (Hb) values are considered primary indicators and gold standard to guide blood transfusion, but lab results take time and repetitive measurements may not be feasible. Rapid and accurate measurements of Hb can guide warranted blood transfusions and avoid unnecessary transfusions in emergency neurosurgery. In this regard, point of care testing devices for Hb can be of great use. **Design:** Prospective study to assess the accuracy of Hb values obtained through HemoCue Hb, Sweden analyser compared to laboratory Hb reports in patients undergoing emergency neurosurgery and Intensive Care Unit (ICU). **Conduct:** The study was conducted in 50 patients undergoing emergency neurosurgery at National Institute of Mental Health

Table 1: The differences in heamoglobin values obtained through the device and lab analysis are not significant

Pair 1 heamoglobin device values-heamoglobin lab values			
Difference mean	t	df	P
-0.29	-0.266	48	0.79

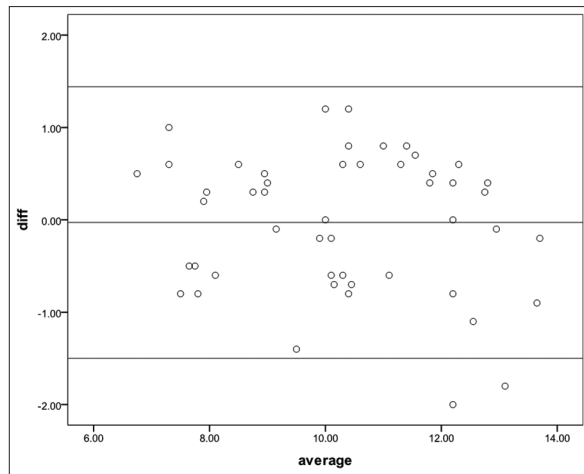


Figure 1: The Bland Altman analysis shows good agreement between the device and lab haemoglobin values

and Neurosciences and in Neurosurgical ICU. Blood sample was collected intraoperatively and Hb value was obtained using HemoCue Hb analyser immediately, and the same sample was sent for lab analysis. **Analysis of the Study:** SPSS 19 was used for the study. Paired sample *t*-test for comparison and Bland Altman plot was used to find the agreement between the two methods. **Results:** Paired samples *t*-test. **Conclusion:** HemoCue Hb analyser can be useful to guide blood transfusion in emergency neurosurgery and neurocritical care. **Limitations:** Availability of the device and small sample size **Applicability:** Simple and useful device to obtain instant Hb values in a high volume centre where lab reports are usually delayed and can be performed even by paramedical staff anytime of the day.

ISNACC-S-29

Effect of anaesthetics on glioblastoma cell line migration, proliferation and matrix metalloproteinase-2

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Introduction: Anaesthetic technique and other perioperative factors have the potential to impact the invasion and migration ability of tumour cells that can affect long-term outcome after cancer surgery. The aim of this study is to investigate the effect of sevoflurane and thiopentone on cell migration, proliferation and matrix metalloproteinase (MMP)-2 of glioblastoma cell line. **Methodology:** Human glioblastoma U87MG cell line was chosen for the study. The study comprised a study group (cell line exposed to different concentration

of sevoflurane/thiopentone) and a control group (cell line not exposed to sevoflurane/thiopentone). In the thiopentone group, cells were treated with 100 μ M, 500 μ M and 1000 μ M concentrations of thiopentone for 30 min. In these sevoflurane group, the cells were exposed to 2.5% sevoflurane in air-oxygen mixture with a FiO_2 of 45–55% in an incubator chamber for 90 min. Cells in control group for sevoflurane were only exposed to mixture of 45–55% O_2 . Migration and activity of MMP-2 were assessed by wound healing migration assay and gelatin zymography assay, respectively, after incubation for 24 h whereas proliferation was assessed by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide assay after 48 h of incubation. **Results:** Various concentrations of thiopentone and 2.5% sevoflurane significantly lowered the migration of the U87MG glioma cells and MMP-2 activity ($P < 0.05$) compared to controls. However, there was no significant effect of both thiopentone and sevoflurane on proliferation. **Discussion:** Anaesthetics at increasing concentration cause a decrease in cell migration and MMP activity essential for metastasis. This study may have implications for future development of anti-malignant therapy and can influence the choice of anaesthetic agent in cancer surgeries.

ISNACC-S-30

Intraoperative haemodynamic changes during emergency surgical decompression in head injury patients

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Background: Intraoperative hypotension is associated with worse outcomes in head injury patients. We intended to study the intraoperative haemodynamic changes in traumatic brain injury (TBI) patients undergoing emergency surgery. **Methodology:** Twenty adult patients undergoing surgery for TBI within 48 h of insult were recruited. Patients' demographics and clinical findings were recorded. After induction, the radial arterial line was secured and cardiac output was monitored with FloTrac/EV1000 sensor to obtain cardiac index (CI), stroke volume index (SVI), pulse rate (PR) and mean arterial pressure (MAP). Systemic vascular resistance index (SVRI) was measured in patients who had central venous catheter *in situ*. Data were collected at following time points – incision, craniotomy beginning, end, durotomy and after decompression. **Results:** CI decreased during