

hypertension in brain death is associated with cardiac dysfunction; when such a heart is transplanted, cardiac dysfunction often resolves. This scenario offers insight into the mechanisms of reversible forms of cardiac injury and suggests that treatment of the extracardiac milieu can result in the recovery of cardiac function. Thus, we hypothesized that if the milieu of raised ICP is removed by neurosurgical procedures, the cardiac dysfunction in such conditions may resolve. The objective was to evaluate our hypothesis whether normalization of ICP after neurosurgery will revert the effects of intracranial hypertension on hemodynamics and cardiac mechanical function.

Materials and Methods: This pilot prospective observational study included 50 patients; 25 patients with raised intracranial pressure (ICP) and 25 patients without raised ICP for whom transthoracic echocardiography was performed before and after neurosurgery. Hemodynamic and echocardiographic parameters were collected during pre-, intra-, and postoperative periods and used for statistical analysis.

Results: An increased incidence of markers of diastolic dysfunction (40%) and systolic dysfunction (20%), which was statistically significant ($p < 0.001$) was found in the raised ICP group. Though markers of systolic dysfunction improved, diastolic dysfunction did not revert with neurosurgery.

Conclusions: Our study suggests that raised ICP might contribute to the pathophysiology of sympathetic overactivity and sympathetically driven cardiac dysfunction, which does not entirely revert in the immediate postoperative period.

A009 Anesthetic Requirements in Patients with Medically Refractory Seizures Undergoing Neurosurgery

Nagmoti S. Vikasrao,¹ Smita V.,¹ Ajay P. Hrishik,¹ Manikandan S.¹

¹*Division of Neuroanesthesia and Neurocritical Care, Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Trivandrum, Kerala, India*

Background: Antiepileptic drugs (AEDs) are known to alter the requirement of anesthetic agents depending on their interaction with these agents. We performed a study to test the hypothesis that the requirement of propofol for induction and maintenance of anesthesia in patients with medically refractory seizures (MRS) on multiple AEDs will be altered when compared with that in patients on single AED.

Materials and Methods: We conducted a prospective observational study on neurosurgical patients in our hospital. Anesthesia was induced and maintained with propofol using Schnider's protocol using a target control infusion (TCI) pump, along with fentanyl and atracurium in all patients. The effect site concentration of propofol (Ce) was titrated to target a bispectral index (BIS) of 45 to 55. The dose of propofol required for induction, Ce of propofol for maintenance, fentanyl requirement, and emergence parameters were noted and compared with that of patients on levetiracetam. Data were analyzed using unpaired student t-test for parametric data and Chi-square test for nonparametric data.

Results: We recruited 34 patients with MRS on multiple AEDs and 10 patients with levetiracetam in our study. Patients with MRS were found to have significantly lower requirement of propofol for induction and maintenance, and had rapid emergence, when compared with patients on levetiracetam ($p < 0.05$). Requirement of fentanyl was also less in patients with MRS, when compared with levetiracetam group, but this was not statistically significant.

Conclusions: Patients with MRS on multiple AEDs have lower propofol requirements during induction and maintenance of anesthesia.

A010 Evaluation of Analgesic Effect of Ropivacaine versus Ropivacaine with Clonidine in Caudal Epidural Block in Lumbosacral Spine Surgery

Reena Dave,¹ Sunita Meena,¹ Shobha Purohit¹

¹*Department of Anaesthesiology, SMS Medical College and Hospital, Jaipur, Rajasthan, India*

Background: To compare effect of 0.2% ropivacaine alone versus 1 µg/kg of Clonidine with 0.2% ropivacaine in caudal epidural block in lumbosacral spine surgery with respect to VAS score, duration of analgesia, hemodynamics, and associated side effects.

Materials and Methods: A double blinded controlled interventional study was performed in which a total of 72 patients of lumbosacral spine surgery were studied and randomized into two groups. Each group received 20 mL of caudal epidural injection either of 0.2% ropivacaine alone (group A) or 1 mg/kg of injection clonidine with 0.2% ropivacaine (group B) according to group allocation after patient was placed prone for surgery after general anesthesia. VAS score, duration of analgesia, sedation score, and side effects were recorded at regular interval postoperatively up to 24 hours and hemodynamics were recorded in both intraoperative and postoperative period.

Results: Mean VAS scores were significantly lower in group B as compared with group A for the first 12 hours postoperatively. Significant difference was observed in duration of analgesia between both the groups. Group B showed prolonged duration of analgesia. There were no significant differences observed with respect to hemodynamics, sedation score, and side effect profile of patients in both groups.

Conclusions: The results suggested that injection clonidine is a good and effective adjuvant for analgesia to 0.2% injection ropivacaine for caudal epidural block in lumbosacral spine surgery.

A011 Effect of Phenylephrine versus Mephentermine Treatment on Frontal Lobe Oxygenation during Correction of Hypotension in Supratentorial Cerebral Tumor Patients under General Anesthesia: A Randomized Controlled Study

Roshan K. Nisal,¹ Ramesh V. J.,¹ Sudhir V.¹

¹*Department of Neuroanesthesiology and Neurocritical Care, National Institute of Mental Health and Neuro Sciences (NIMHANS), Bengaluru, Karnataka, India*

Background: To evaluate the changes in cerebral oxygenation (ScO₂) as measured by near-infrared spectroscopy (NIRS) between bolus doses of phenylephrine and mephentermine when used to treat hypotension in patients undergoing supratentorial tumor surgery under general anesthesia.

Materials and Methods: This was a randomized controlled study including 80 ASA-1 and -2 patients between 18 and 65 years scheduled for supratentorial tumor surgery. Patients were anesthetized with propofol (1.5–2 mg/kg) and fentanyl (1.5–2 µg/kg); and were randomized after hypotension during anesthesia induction to receive bolus dose of either phenylephrine (100 µg) or mephentermine (6 mg). Ipsilateral and contralateral ScO₂ using NIRS, cardiac output using NICOM, mean arterial pressure, systemic vascular resistance, and heart rate were recorded at hypotension, at drug administration and every minute for a total duration of 10 minutes after achieving desired MAP level with study drug.

Results: Both ipsilateral and contralateral ScO₂ decreased significantly in phenylephrine group after drug administration at all 10-minute time points as compared with hypotension time point (<0.001). While in mephentermine group, ipsilateral and contralateral ScO₂ increased significantly at all time points (<0.001). On intergroup comparison, difference of cerebral oxygenation value between two groups was significant at all time points after hypotension for both ipsilateral and contralateral ScO₂ ($p < 0.001$). CO decreased significantly in phenylephrine group (<0.001), while increased significantly in mephentermine group at time points of 3 to 10 minutes (<0.001). Cardiac output had statistically significant effect on ScO₂ ($p = 0.005$).

Conclusions: Associated with changes in cardiac output, ScO₂ decreased after phenylephrine treatment while increased after mephentermine treatment.

A012 Comparison of Effect of Ketofol (Ketamine and Propofol) versus Propofol on Jugular Venous Oxygen Saturation in Moderate to Severe Traumatic Brain Injury: A Prospective Randomized Trial

Tania Singh,¹ Nidhi Panda,¹ Ankur Luthra,¹ Rajeev Chauhan¹

¹Department of Anaesthesia and Intensive care, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India

Background: Comparison of effect of ketofol with respect to propofol on jugular venous oxygen saturation when used for maintenance of general anesthesia in moderate to severe traumatic brain injury patients as the primary outcome.

Materials and Methods: A prospective randomized controlled trial was done on 40 TBI patients undergoing decompressive hemicraniectomy. Patients in group P ($n = 20$) received propofol, while patients in group KP ($n = 20$) received combination of ketamine and propofol (1:5) for maintenance of anesthesia. SjvO₂ monitoring, intraoperative hemodynamic parameters, ONSD, brain relaxation score,

S100B levels, MRS at discharge, and extended Glasgow outcome scale (GOSE) at 1 and 3 months were observed.

Results: No statistically significant difference was found with respect to jugular venous oxygen saturation in either group. However, intraoperative hemodynamic parameters were better maintained in patients receiving ketofol compared with those receiving propofol ($p < 0.05$) with decreased requirement of phenylephrine or mephentermine in ketofol group. There was no statistically significant difference in quality of brain relaxation, preoperative and postoperative ONSD, MRS, GOSE at 1 month and 3 months, SB100 levels, and number of ventilator days in the either group.

Conclusions: Ketofol (combination of ketamine and propofol in the ratio 1:5) and propofol similarly maintain cerebral oxygenation. However, hemodynamics appears to be better maintained with ketofol as the maintenance agent.

A013 Effect of Different Surgical Positions on the Changes in Cerebral Venous Drainage (CVD) and Intracranial Pressure (ICP) in Patients Undergoing Elective Neurosurgery

Keta Thakkar,¹ Manikandan S.,¹ Ranganatha,¹ Praveen C.S.¹

¹Division of Neuroanesthesia and Neurocritical Care, Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Trivandrum, Kerala, India

Background: Various positions employed to facilitate neurosurgical procedures can compromise the cerebral venous return and can cause increase in ICP. There are no direct indices of CVD. We aimed to use ultrasound (USG) and Doppler indices to assess the changes in CVD during positioning (supine, prone, and lateral) of patients undergoing neurosurgical procedures.

Materials and Methods: After IEC approval, consented ASA I/II patients with GCS 14 to 15 undergoing elective primary brain tumor resection surgery were included. Internal jugular vein (IJV) cross-sectional areas and peak Doppler velocities were recorded on both sides with USG at three different time intervals (before induction of anesthesia (T₀), 10 minutes after induction (T₁), and 10 minutes after final positioning (T₂)). In addition, optic nerve sheath diameter (ONSD) was measured as an estimate of ICP at T₁ and T₂. Forty-five patients were included in all three groups, that is, supine, lateral, and prone (15 each).

Results: We found a significant change in flow from supine 0 to 30 degrees head tilt. In prone position, in spite of increase in IJV cross-sectional area, flow did not change. In lateral, the dependent side showed a severe decrease in IJV flow ($p < 0.05$). The maximum increase in ONSD was found in lateral position. The right IJV was dominant in 88% patients.

Conclusion Decrease in IJV flow was seen after final positioning, more significantly in dependent side of lateral position and supine with head tilt. This warrants careful positioning during neurosurgical procedures to prevent iatrogenic increase in ICP which can lead to brain bulge and increased bleeding.