

A006 Anesthetic Considerations for Multimodal Intraoperative Neurophysiological Monitoring in Predicting Early Position Related Neurological Insult during Cervical Myelopathy Surgery: An Institutional Review of 56 Consecutive Cases

Senthil Kumar,¹ Vijay S.,² Vishwaraj R.,² Nishanth S.,³ K.R. Suresh B.²

¹Institute of Anaesthesia, SIMS Hospitals, Chennai, Tamil Nadu, India

²Institute of Neurosurgery, SIMS Hospitals, Chennai, Tamil Nadu, India

³Division of Neurophysiology, SIMS Hospitals, Chennai, Tamil Nadu, India

Background: The risk of neurological injury is inherent during surgical positioning for patients with unstable surgical spine and patients with severe myelopathic changes. The role of Intraoperative neurophysiological monitoring (IONM) and anesthetic drug optimization in these scenarios are not well defined. This review is aimed to study the impact of choice and dosing of anesthetic drugs for obtaining consistent multimodal IONM signals and predicting early neurological deficits during surgical positioning of patients with cervical spine disorders.

Materials and Methods: Data from 56 adult patients undergoing cervical spine surgeries for spondylotic or traumatic myelopathy under IONM were reviewed (January 2017–June 2019). Data regarding anesthesia drugs, intubation technique, time to obtain consistent IONM signals, IONM data before and after positioning, and any corrective measures after positioning were collected and analyzed.

Results: Complete data were obtained from 46 patients. The patients were induced with fentanyl (2 µg/kg), propofol (2 mg/kg) and after checking mask ventilation atracurium (0.4 mg/kg) intravenous (IV) administration. All patients were intubated with manual inline stabilization. Anesthesia was maintained with propofol (75 µg/kg/min) and fentanyl (0.5 µg/kg/h). Motor and sensory evoked potentials (MEP and SSEP) were recorded every 10 minutes. The mean time required for obtaining SSEP signals were 15 ± 3 minutes and for MEP signals were 20 ± 5 minutes. In 43 patients, there was no significant change in IONM signals during positioning. In three patients, significant drop in IONM signals without change in EEG signals indicating local neurological injury. Surgical positioning was immediately adjusted to obtain baseline signals.

Conclusions: This study highlights the anesthetic feasibility of utilizing multimodal IONM during surgical positioning to predict and correct any position related neurological deficits prior to the start of definitive surgery. Prospective studies with adequate sample size will be needed to standardize the anesthetic protocol in these scenarios.

A007 Comparison of Total Intravenous Anesthesia (TIVA) versus Volatile Induction Maintenance Anesthesia (VIMA) Complemented by Controlled Hypotension on Quality of Surgical Field during Transsphenoidal Resection of Pituitary Tumor

Jonnakuti S. Kumar,¹ Gandhi K. Anil,¹ Nidhi B. Panda,¹ Apinderpreet Singh,¹ Divya Jain¹

¹Department of Anaesthesia and Intensive Care, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India

Background: To compare quality of surgical field assessed by the surgeon using Boezaart's score in patients receiving TIVA and VIMA complemented by controlled hypotension. Effect on the hemodynamic parameters, estimated blood loss, and recovery profile were recorded.

Materials and Methods: A prospective randomized controlled trial was conducted on 72 patients undergoing transsphenoidal resection of pituitary tumor after approval from Institute Ethics Committee and written informed consent from patients. TIVA group received propofol infusion and VIMA group received sevoflurane. Dexmedetomidine and lignocaine infusions were used for controlled hypotensive in both the groups. Primary objective was quality of surgical field assessed by the surgeon using Boezaart's score. Secondary objectives were to observe effect on the hemodynamic parameters, estimated blood loss and recovery profile.

Results: Thirty-six patients were included in each group. Quality of surgical field was good and comparable in both the groups. Both the groups have shown quality of surgical field with a median score of 1 in 15 minutes and a median score of 2 in the rest of the intraoperative period. Emergence time and extubation time were statistically shorter in TIVA group with a p-value of 0.005 and 0.038, respectively.

Conclusions: There was no difference in quality of surgical field using anesthetic technique TIVA or VIMA during transsphenoidal resection of pituitary tumor although emergence was faster in patients receiving TIVA.

A008 Comparison of Hemodynamics and Cardiac Function before and after Neurosurgery in Patients with and without Raised Intracranial Pressure: A Pilot Observational Study with Transthoracic Echocardiography

Neeraja Ajayan,¹ Unnikrishnan P.,¹ Ajay P. Hrishi,¹ Smita V.,¹ Ranganatha Praveen,¹ S. Manikandan¹

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

Background: Raised intracranial pressure (ICP) can have profound cardiovascular effects which can adversely affect the prognosis of neurosurgical patients. Intracranial

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

¹Division 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

¹Department 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

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