

**Conclusions:** Setting up and effective utilization of any new investigation modalities has its own challenges. Our experience shows that it takes multiple iteration of the shifting process, along with initial training session and mock drill, proper education of neurosurgical technicians and nursing staff, and meticulous data collection and auditing to analyze and smoothen the workflow.

#### A0038 A Rare Case of Cephalic Tetanus: Diagnostic Dilemma

Rahul Ghiya,<sup>1</sup> Bhibukalyani Das,<sup>1</sup> Indranil Ghosh<sup>1</sup>

<sup>1</sup>Department of Neuro-Critical Care, Institute of Neurosciences, Kolkata, West Bengal, India

**Background:** Tetanus is an acute toxemic illness caused by soluble exotoxin of *Clostridium tetani*. Localized tetanus, especially the cephalic component, is extremely rare.

**Case Description:** The case of a 64-year-old woman with cephalic tetanus is described who went through a stormy hospital stay but ultimately went home in a stable condition. She was admitted with deviation of mouth to the left and slurring of speech without any loss of consciousness or muscle weakness. Next day she was complaining of dysphagia and choking. She was started on methylprednisolone and immunoglobulin suspecting a diagnosis of acute infective demyelinating polyneuropathy with bulbar involvement. At this time, all investigations including CSF analysis and MRI were normal. Over the next day, her symptoms increased and she developed trismus with sudden laryngospasm and respiratory arrest. She was intubated after administration of succinylcholine and ventilated under sedation. Over the next 2 days, she continued to develop autonomic dysfunction and was administered anti-tetanus immunoglobulin 500 IU intramuscularly. She underwent tracheostomy after which she again received 2,000 IU of anti-tetanus immunoglobulin. After this she received magnesium infusion to target a serum magnesium of 3 to 4 mg/dL. She continued to receive magnesium till it was more than 4 mg/dL. As trismus and autonomic dysfunction continued, she was given diazepam 5 mg twice daily orally and dexmedetomidine infusion. Gradually, she was weaned off, and dose of diazepam was increased to 10 mg thrice daily. As a last resort, she was administered intrathecal anti-tetanus immunoglobulin 250 IU. After this she showed gradual improvement in her symptoms and was decannulated. Thus, after almost 4 weeks, she was fit for discharge.

**Conclusions:** Cephalic tetanus is characterized by frequent laryngeal spasms with danger of death from asphyxia. It was a difficult case with lots of diagnostic dilemma, successfully managed at our institute.

#### A0039 Effect of Perioperative Blood Pressure on Neurological Outcome in Patients Undergoing Clipping following Aneurysmal Subarachnoid Hemorrhage

Shailesh Gupta,<sup>1</sup> Prachi Agarwal,<sup>1</sup> Nidhi Panda,<sup>1</sup>

Kiran Jangra,<sup>1</sup> Sivashanmugam S. Dhandapani,<sup>2</sup>

Hemant Bhagat<sup>1</sup>

<sup>1</sup>Department of Anaesthesia and Intensive Care, Postgraduate Institute of Medical Education and Research, Chandigarh, India

<sup>2</sup>Department of Neurosurgery, Postgraduate Institute of Medical Education and Research, Chandigarh, India

**Background:** It is postulated that elevated blood pressure (BP) is a homeostatic response to elevated intracranial pressure serving to maintain cerebral blood flow. Low BP results in cerebral hypoperfusion, which may aggravate ischemic injury. Studies to define the optimum BP associated with good neurological outcome are lacking. Therefore, we sought to observe the effect of perioperative blood pressure on long-term neurological outcome of patients with aneurysmal SAH.

**Materials and Methods:** After Institute Ethics Committee approval and written informed consent from the patients or their nearest kin, 338 patients with SAH of all grades and age more than 18 years scheduled to undergo surgery were included in the study. The systolic, diastolic and mean blood pressures were recorded at admission, preoperatively and intraoperatively. Postoperative blood pressures were recorded till ICU stay of the patient.

**Results:** Higher values of SBP, DBP, and mean arterial pressure (MAP) at the time of admission and in the preoperative period were associated with favorable neurological outcome at 3 months. There was no effect of intraoperative BP on the postoperative long-term neurological outcome. In the early postoperative period, patients with higher SBP, DBP, and MAP were associated with unfavorable neurological outcome. However, multiple logistic regression analysis did not demonstrate the effect of perioperative BP as an independent risk factor for long-term neurological outcome in patients with aneurysmal SAH.

**Conclusions:** The perioperative blood pressure is not an independent predictor of long-term neurological outcome in patients undergoing aneurysmal neck clipping following SAH. Since admission, preoperative and early postoperative BPs have the potential to affect the outcome, BP should be meticulously observed and maintained within the normal physiological limits.

#### A0040 Evaluation of Cerebral Perfusion Pressure and Cerebral Blood Flow Velocities in Different Head Positions Using Transcranial Doppler in Neurosurgical Patients

Nisha Basker,<sup>1</sup> Sethuraman Manikandan,<sup>1</sup> Mathew Abraham<sup>2</sup>

<sup>1</sup>Department of Anaesthesia, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India

<sup>2</sup>Division of Neuroanaesthesiology, Department of Neurosurgery, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India

**Background:** Different head positions in neurosurgical patients in the postoperative unit may affect cerebral perfusion pressure. The primary aim of this study was to investigate the effects of various head positions on the cerebral blood flow velocities by transcranial Doppler (TCD) in these patients.

**Materials and Methods:** This study with observational, prospective repeated measures was designed to measure bilateral MCA (middle cerebral artery) flow velocities, pulsatility index using TCD at different head positions in 20 patients who underwent cranial surgery admitted in the NSICU within 24 hours of surgery. The data collection

was done in supine position with 0°, 30°–45° and 60°–70° head elevations. Postural changes in hemodynamic variables (HR, MAP) were recorded. Estimated cerebral perfusion pressure (eCPP) was calculated as  $MAP \times FVD/FVm + 14$ . Near-infrared spectroscopy, invasive blood pressure data at two different transducer locations, and changes in neurological status as the secondary outcomes were simultaneously recorded.

**Results:** Out of 20 patients who underwent craniotomy for intracranial lesion, 14 patients (mean age  $41 \pm 14$  years) were evaluated. Six patients were excluded due to poor cooperation and inadequate temporal window. On average, MCA mean flow velocity (mFV) on the right and left hemispheres decreased by 10% and 8%, respectively, due to the postural change from 0° to 60° with major change occurring at 60°. Mean mFV for the Rt MCA at 0 degree (mean  $44.9$ ,  $SD \pm 8.7$ ) decreased ( $p = 0.04$ ) at 60° (mean  $39.8$ ,  $SD \pm 7.2$ ). Mean mFV for the Lt MCA at 0° (mean  $44.0$ ,  $SD \pm 14$ ) decreased ( $p = 0.14$ ) at 60° (mean  $39.9$ ,  $SD \pm 12$ ). PI remained unchanged (mean  $1.0$  at 60°,  $1.0$  at 30°, and  $0.9$  at 0°) at each head position, indicating no distal increase in resistance to blood flow.

**Conclusions:** We found that up to 30° to 45° head elevation did not significantly affect the CBF velocity. Generalizability is limited by small sample size.

#### **A0041 Pineal Region Space-Occupying Lesion Surgery in Sitting Position in a 2.5- Year-Old Patient: A Case Report** **S. Ushakiran Singh,<sup>1</sup> Josemine Davies<sup>2</sup>**

<sup>1</sup>Department of Anaesthesiology, Armed Forces Medical College, Pune, Maharashtra, India

<sup>2</sup>Department of Anaesthesiology and Critical Care, Command Hospital, Southern Command, Pune, Maharashtra, India

**Background:** The sitting position for neurosurgery was first introduced by De Martel in 1931, and it provides ideal access to the surgeon for suboccipital craniotomy. Sitting position in pediatric population presents unique physiological challenges for the anesthesiologist with potential for serious complications like venous air embolism, postural hypotension, and serious cardiac arrhythmias due to surgical stimulation of cranial nerves and brainstem. The present case is one of the youngest cases reported so far.

**Case Description:** A 2.5- year-old girl presented with complaints of intermittent fever and vomiting for 30 days, weakness of left upper limb and lower limb for 3 days and two episodes of generalized seizure. On evaluation, a pineal space-occupying lesion (SOL) was diagnosed. A ventriculoperitoneal shunt was placed to relieve the mass effect and a suboccipital craniotomy with excision of SOL in sitting position under general anesthesia was decided. After detailed evaluation by the neuroanesthesiologist, the patient was accepted for surgery in ASA III. The patient underwent the procedure with invasive monitoring, in addition to standard ASA monitoring. Modified sitting position was achieved with elevation of lower limbs, and lower limbs were wrapped with elastic bandage to prevent venous pooling. Intraoperative period was uneventful. Patient was not extubated and shifted

to PICU for elective postoperative mechanical ventilation and monitoring. The patient was extubated next day without any complication. The patient recovered with some residual weakness.

**Conclusions:** The sitting position still has a role in modern neurosurgical practice but should be considered following consideration of its potential complications. Proper vigilance and monitoring with appropriate precautions can prevent complications both during and after the surgery.

#### **A0042 Incidence of Hypovolemia in Preoperative Period and Its Correlation with Induction Hypotension in Patients with Aneurysmal Subarachnoid Hemorrhage**

**Guru C. Dasari,<sup>1</sup> Kiran Jangra,<sup>1</sup> Virendra K. Arya,<sup>1</sup> Nidhi Panda,<sup>1</sup> Hemant Bhagat,<sup>1</sup> Ashish Aggarwal<sup>2</sup>**

<sup>1</sup>Department of Anaesthesia and Intensive care, Postgraduate Institute of Medical Education and Research, Chandigarh, India

<sup>2</sup>Department of Neurosurgery, Postgraduate Institute of Medical Education and Research, Chandigarh, India

**Background:** Volume status is an important factor in the clinical outcome of aneurysmal subarachnoid hemorrhage (aSAH) patients. Previous studies reported that 36% to 100% of these patients have low intravascular volume. Various causes of contracted intravascular volume include poor intake, use of decongestants, supine diuresis syndrome, and cerebral salt-wasting syndrome. Various dynamic and static parameters and both invasive and noninvasive monitors are available in the literature. We plan to evaluate the efficacy of transthoracic echocardiography (TTE) and inferior vena cava collapsibility index (IVCx) to determine the prevalence of preoperative hypovolemia and its association with induction hypotension.

**Materials and Methods:** Hundred patients of age group 18 to 65 years, ASA I or II, with aSAH scheduled to undergo clipping surgery were included. Patients with stunned myocardium or valvular abnormalities, end-organ damage, and pregnancy were excluded. Hypovolemia was defined by Kissing Papillary sign, left ventricular end-diastolic area  $< 10 \text{ cm}^2$ , VTI variations with spontaneous respiration  $> 12\%$ , and IVC Collapsibility index  $> 50\%$ . Induction hypotension was defined as mean arterial pressure (MAP)  $< 70 \text{ mm Hg}$  or  $> 40\%$  decrease in from baseline till 10 minutes after induction.

**Results:** A total of 98 patients were analyzed, and 2 were excluded. Incidence of hypovolemia was 70.4%. Out of 98 patients, 69 patients were found to be hypovolemic and 29 patients were euvoletic. VTI variations and IVC collapsibility index were most sensitive parameters (sensitivity 89.5% and 88.4%, respectively). MAP was lower in hypovolemic patients ( $p = 0.003$ ) during study period. Correlation between hypovolemia and hypotension was highly significant with  $p$  value of 0.001.

**Conclusions:** We conclude that noninvasive tools such as TTE and IVC collapsibility index should be used by anesthesiologists prior to induction for assessment of volume status and to facilitate fluid resuscitation so as to prevent hypotension in patients with a-SAHA.