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Prone positions influence on regional cerebral oxygen saturation in patients undergoing spinal neurosurgery

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Introduction: Cerebral hypoxia is a leading cause of adverse cerebral outcomes. Regional cerebral oxygenation intraoperative monitoring can prevent from complications like cognitive dysfunction, organ failure reducing hospitalization time.

Aim: The aim of the study was to determine whether prone position impacts cerebral oxygenation in spinal neurosurgical patients using near infrared spectroscopy device intraoperatively.

Materials & Methods: 25 patients (mean age 56 years) undergoing transpedicular fixation, microdiscectomy, removal of spinal tumors in prone position were included. Cerebral oxygen saturation (rScO₂) was continuously monitored using INVOS 4100 NIRS device. We assessed cognitive dysfunction, blood loss, postoperative complications (stroke, organ dysfunction, days spent in ICU). Anesthesia induction: fentanyl 0.1-0.2 mg, propofol 1-2 mg/kg, cisatracurium 0.2 mg/kg; maintenance-fentanyl 0.03-0.06 µg/kg/min, cisatracurium 0.06-0.1 mg/kg/h, sevoflurane to MAC 0.7-1.0, FiO₂ 0.5.

Results: Mean rScO₂ during induction was 72% for left side (L), 73% right side (R). In prone position L74%, R74%, was returning back to spinal position L74%, R73% during the whole surgery L73%, and R73%. Significant difference in calculated mean rScO₂ values between supine and prone position was not observed. Despite the calculated mean rScO₂ values 11/25 patients showed a slight up to significant decrease in rScO₂ in prone position. The minimum rScO₂ value observed was 55%. One patient with adipositas rScO₂ values decreased for 26% from baseline values when turned to prone position (from 85% supine to 58% in prone position). No incidence of cognitive dysfunction, stroke, organ dysfunction was observed, no patients were admitted to ICU.

Conclusions: Although our first experience revealed that the mean intraoperative cerebral oxygen saturation changes during spinal neurosurgery in prone position from baseline values is not significant, almost half of the patients experienced mild to moderate decrease in cerebral oxygen saturation. Near infrared spectroscopy devices can be served as a supplementary tool in spinal neurosurgery to maintain adequate cerebral oxygen saturation.

Biography

Sniedze Murniece is working as a Neuroanesthesiologist at Riga East University Hospital, Latvia. Currently, she is pursuing her PhD in Medicine and doing her research in Spinal Neurosurgery and Cerebral Oxygen Saturation Monitoring.

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