



CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

Acute Stroke Management during Pregnancy Consensus Statement *Anesthetic Management*

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Published Guidelines

Guideline	Recommendations
<p>Practice Guidelines for Obstetric Anesthesia: An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and the Society for Obstetric Anesthesia and Perinatology</p> <p>Anesthesiology 2016; 124 (2): 00-00</p>	<p>General guidelines-none are stroke-specific</p>

Evidence Table

Anaesthetic Considerations

Study/Type	Sample Description	Method	Outcomes	Key Findings and Recommendations
Yoshitani et al. 2013 Japan Review	NA	NA		<p>Cesarean delivery should be considered before neurosurgical intervention because most fetuses can survive without sequelae.</p> <p>Cesarean delivery should be performed before craniotomy (after 28-32 weeks of gestation) as intervention during neurosurgery (e.g. management of hypotension, use of osmotic diuretics, and mechanical hyperventilation) are risks for the fetus.</p> <p>Anesthetic management for Cesarean delivery and craniotomy:</p> <ol style="list-style-type: none"> I. Premedication <ul style="list-style-type: none"> • Non-particulate antacids and H2 blockers should be administered to minimize risk of vomiting and aspiration of gastric contents • Sedative agents may be appropriate for patients with extreme anxiety; however, risk of hypoventilation, hypercarbia and subsequent high intracranial pressure should be taken into account. II. Anesthesia induction <ul style="list-style-type: none"> • Rapid sequence induction is recommendation to prevent regurgitation and aspiration of gastric contents • Cricoid pressure should be maintained until tracheal intubation is confirmed by capnography; note that there is risk of hemodynamic response to intubation • Opioids, e.g. fentanyl should be administered to prevent maternal and fetal hemodynamic deterioration • Smaller tracheal intubation tubes (6.0mm) are recommended due to increased aldosterone levels and total body water and accumulation of extracellular fluid during pregnancy; additional equipment for managing a constricted airway should be on hand. • At least 2 minutes of pre-oxygenation and denitrogenation with 100% oxygen administered through a tightly fitted face mask is strongly recommended before tracheal intubation of pregnant patients. III. Anesthetic management <ul style="list-style-type: none"> • Every effort should be made to maintain hemodynamic stability during neurosurgical intervention • Blood pressure should be maintained within a narrow range, from 140/90 to 160/110 mmHg. • Due to increased ventilation and progesterone, normal range of PaCO₂ during pregnancy decreases to 30-32 mmHg; hyperventilation to reduce IP should be kept in the range of 25-30 mmHg.

Study/Type	Sample Description	Method	Outcomes	Key Findings and Recommendations
			<ul style="list-style-type: none"> Excessively deep anesthesia should be avoided to prevent hemodynamic instability; measurement of anesthetic depth is an important using bispectral index monitoring or an alternative method of monitoring consciousness Fluid management has yielded conflicting recommendations: Mannitol used to control ICP is associated with risk of fetal dehydration; however, individual case reports have shown that 0.2 to 0.5mg/kg of mannitol has no significant effect on fetal fluid balance. 	
<p>Huang et al. 2010</p> <p>Taiwan</p> <p>Retrospective study</p>	<p>303 862 women who had underwent Cesarean delivery between 2002-2007.</p>	<p>To determine whether there was an increased risk of future stroke associated with type of anesthesia (general, spinal or epidural), data from National administrative databases were used to identify women who had delivered via Cesarean delivery, mode of anesthesia, diagnosis of stroke and presence of preeclampsia. For those who suffered a stroke, only the first stroke event after delivery was included. Stroke-free survival time was defined as the period between the index delivery and admission for any type of stroke.</p>	<p>Stroke-free survival according to type of anesthesia</p> <p>Possible confounding variables included age, multiple gestation, comorbidities, and history of Cesarean deliveries.</p>	<p>Duration of follow-up was 6 years.</p> <p>Of the total sample, 8,567 had preeclampsia, of which 75 had suffered a stroke Of the 292, 295 women who were free of preeclampsia, there were 303 stroke cases</p> <p>Among all women, the risk of stroke associated with general anesthetic was significantly higher compared with neuraxial anesthesia (Adjusted HR=1.49, 95% CI 1.02-2.18, p=0.041)</p> <p>The risk of stroke for mothers with preeclampsia was significantly higher (Adjusted HR=7.00; 95% CI 5.30-9.25, p<0.001).</p> <p>Stroke-free survival rate was significantly lower in preeclamptic women who received general anesthesia compared to those who received either epidural, (p=0.008) or spinal an aesthesia (p<0.001)</p> <p>There was no significant difference in the rate of stroke between women who received spinal and epidural anesthesia, p=0.143.</p> <p>The risk of stroke was significantly higher among preeclamptic women who received general anesthesia vs. neuraxial anesthesia: Adjusted</p>

Study/Type	Sample Description	Method	Outcomes	Key Findings and Recommendations
				HR=2.38, 95% CI 1.33-4.28, p=0.004 Among women without preeclampsia, the type of anesthesia was not associated with an increased risk of stroke.

Reference List

Huang CJ, Fan YC, Tsai PS. Differential impacts of modes of anaesthesia on the risk of stroke among preeclamptic women who undergo Caesarean delivery: a population-based study. *Br J Anaesth* 2010;105(6):818-26.

Yoshitani K, Yuzuru I, Kuwajima K, Ohnishi Y. Anesthetic management of pregnant women with stroke. *Neurol Med Chir (Tokoyo)* 2013; 53: 537-540.