Seizures, Absence (Petit Mal)

Melissa Brockerville | Lashmi Venkatraghavan

Risk

- Incidence of absence seizures in USA is 1.9–8 cases per 100,000 population.
- Seizures are most common in children aged 4–14 y but rare in adults.

Perioperative Risks

- Risk of transition of absence seizures into tonic-clonic seizures or SE is low but still possible.
- Seizure induced sequelae, including physical injuries, tachycardia, hypertension, hypoxia, metabolic acidosis, pulm aspiration, elevated ICP, and cerebral edema.

Worry About

- Seizure induction with periop drugs and hyperventilation can occur, especially with sevoflurane induction.
- Altered pharmacokinetics and dynamics with anticonvulsants: Resistance to neuromuscular blockers and opioids with chronic therapy
- Maintain serum anticonvulsant levels.

Overview

- Absence seizures are a common seizure disorder of childhood; up to two-thirds of pts are girls.
- Age of onset has bimodal distribution, with the first peak at 6–7 y (childhood) and the second around 12 y (juvenile).
- International League against Epilepsy classification of absence seizures:
  - Absence seizures: Typical or atypical.
  - Absence with special features: Includes myoclonic absence and eyelid myoclonia.
- Typical absence seizures are brief absence (5–20 sec), with impairment of consciousness and an abrupt onset/offset, often accompanied by one or more mild motor manifestations: staring, behavioral arrest, eyelid fluttering, or hand/face automatisms.
- Atypical seizures have a less rapid onset/offset with more motor features and prolonged seizures.
- Hyperventilation and bright flickering lights are common triggers for absence seizures, except for atypical absence seizures, which often occur during drowsiness.
- Attacks may be few or occur >100 times per d.
- Accidental injuries are rare.
- Minimal postictal sequelae occurs: EEG and consciousness return immediately.
- SE may occur: Convulsive and nonconvulsive SE are possible
- Remission rate for childhood absence epilepsy is 80%; juvenile myoclonic epilepsy carries a high risk of generalized tonic-clonic seizures.

Etiology

- Strong genetic predisposition in otherwise normal children.
- A mutation in the GABA (A) receptor gene was found in some pts with childhood absence epilepsy.
- Structural lesions in adults.

Usual Treatment

- ESM or VPA are first-line drugs. If there is a high risk of generalized tonic clonic seizures, VPA should be used.
- LTG is an alternative agent. Often a combination treatment may be needed.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEME	Agranulocytosis (ESM, VPA) Thrombocytopenia (VPA) Pancytopenia (ESM)			CBC with plt count
RESP	Hyperventilation may induce seizure			
GI	Hepatotoxicity (ESM, VPA) GI upset (VPA)	GI Sx		Liver enzymes
CNS	EEG typically normal between seizures Normal development is rule			EEG
ENDO	Insulin resistance and metabolic syndrome (VPA) Subclinical hypothyroidism (VPA)			Blood sugar TSH
MS	Mild myoclonic movements		Movements	

Key References: Barakat A, Mallory S: Anaesthesia and childhood epilepsy, *Contin Educ Anaesth Crit Care Pain* 11:93–98, 2011; Tenney JR, Glauser TA: The current state of absence epilepsy: can we have your attention? *Epilepsy Curr* 13(3): 135–140, 2013.

Perioperative Implications

Preoperative Preparation

- Continue anticonvulsants on the day of surgery.
- Determine characteristics of typical seizures and frequency, compliance with anticonvulsants therapy.
- Ensure therapeutic anticonvulsant levels.
- Avoid triggers (e.g., bright flashing lights, hyperventilation, crying).

Monitoring

- Routine
- Depth of anesthesia monitors

Airway

- No issues

Induction (General Anesthesia)

- Standard induction drugs provide anticonvulsant action.
- Sevoflurane induction in conjunction with hypocapnia can produce epileptiform spikes and seizure activity in children.
- Avoid etomidate and ketamine; these lower seizure threshold.

Maintenance

- Normocarbia unless otherwise indicated
- Interaction between NMBs and anticonvulsants

Extubation

- Delayed emergence could be because of sedation from periop anticonvulsant use and nonconvulsive SE.

Regional Anesthesia

- Check coagulation profile; use lowest effective LA dose.
- Avoid transarterial injections.

Postoperative Period

- Anticonvulsants should be restarted as soon as possible.
- Adequate pain management is important to avoid stress-induced hyperventilation.

Anticipated Problems/Concerns

- Major periop morbidity is rare.
- Transition of absence seizures into tonic-clonic seizures or SE is the major concern, which would modify the periop risk.

Seizures, Epileptic

R. Alexander Schlichter | Guy Kositratna | W. Andrew Kofke

Risk

- Incidence of epilepsy estimated to be 0.5–2.3%.
- 30–40% of pts with epilepsy will develop intractable seizures (>1/mo refractory to two or more medications).
- Approx 400,000 people in USA have medically uncontrolled epilepsy.

Perioperative Risks

- Epilepsy has causality with a variety of syndromes throughout multiple systems.
- Various psychiatric disorders are assoc with epilepsy (e.g., migraines, depression, psychosis), and antiepileptic drugs are associated with mood, behavior, or cognition disturbances.
- 2 cases per 1000 pt-years result in sudden death associated with epilepsy.
- Many antiepileptic drugs induce hepatic enzymes (p450) or inhibitors which may affect blood levels of drugs such as warfarin, tricyclic antidepressants, statins, chemotherapeutic agents, and antivirals. Specific to anesthesia are NDMRs.