Pseudocholinesterase Deficiency

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PSEUDOCHOLINESTERASE DEFICIENCY
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Introduction
Pseudocholinesterase deficiency is a rare hereditary disorder caused by mutations in the enzyme that metabolizes the anesthetic succinylcholine. This results in a prolonged neuromuscular blockade, which can lead to increased patient risk and treatment challenges. The diagnosis of pseudocholinesterase deficiency should be considered in patients with symptoms such as apnea, delayed emergence, or prolonged paralysis. This condition highlights the importance of preoperative assessment and informed consent in preparing for surgery.

Differential Diagnosis

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<th>Drug Effects</th>
<th>Residual anesthetic, including over sedation and large amounts of narcotics.</th>
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<tr>
<th>Metabolic causes</th>
<th>Hyperthyroidism, Hypothyroidism, Hypoaemia, Hypoglycemia, Hyperglycemia</th>
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<th>Neurological causes</th>
<th>Increased cerebral herniation resulting in intracranial pressure</th>
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<td>Isoelectric seizure occurring in a post-ischemic state</td>
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Case Study
A 34-year-old female was scheduled for a rotator cuff repair surgery. She has no known drug allergies. Her medical history includes a history of diabetes and hypertension, which she takes 50mg metformin and 20mg lisinopril. Past surgery for rotator cuff tear. Family history of anesthetic problems: States that her brother had delayed emergence due to lack of airway management. Indication: Rotator cuff repair. The patient presented with a history of delayed emergence and was treated with neostigmine and atropine. This case highlights the importance of thorough preoperative assessment and the need for adequate reversal agents in patients with potential pseudocholinesterase deficiency.

Pathophysiology
Pseudocholinesterase is an enzyme produced in the liver. The plasma, platelets, and red blood cells contain pseudocholinesterase. It is essential for the hydrolysis of succinylcholine, which is rapidly metabolized to succinylmonocholine, which is then broken down to succinate and carbon dioxide. Elimination of succinylcholine is complex, with a first-pass metabolism in the liver, followed by rapid inactivation of about 90% to 95% in the lungs. Pseudocholinesterase deficiency is an inherited condition that affects the ability of the body to break down succinylcholine, leading to prolonged neuromuscular blockade and respiratory depression.

Nursing Implications
Diagnosis of Pseudocholinesterase Deficiency
- Arrive promptly after receiving a medication administration report.
- Conduct thorough presurgical assessment, including medical history, allergies, and current medications.
- Notify the anesthesia team of the potential pseudocholinesterase deficiency.
- Monitor for signs of respiratory depression and adjust ventilation as needed.
- Use rapid sequence induction with alternative anesthetics such as propofol or desflurane if necessary.

Conclusion
Pseudocholinesterase deficiency is a rare cause of prolonged paralysis. The potential risks of this condition can be life-threatening, thus requiring the activation of emergency protocols. A thorough presurgical evaluation is crucial in identifying a patient with Pseudocholinesterase Deficiency. Always communicate with the anesthesia team and inform the patient and their family. This case study highlights the importance of thorough preoperative assessment and the need for adequate reversal agents in patients with potential Pseudocholinesterase Deficiency.

References