toxtidbits
the maryland poison center's monthly update. news. advances. information.
1-800-222-1222
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Benzocaine and Methemoglobinemia

Benzocaine is a local anesthetic commonly used as a topical pain reliever. Many popular over-the-counter products contain benzocaine as an active ingredient including Anbesol®, Orabase®, Orajel®and Blistex Burn®. It can also be found in otic drops to relieve ear pain such as Auralgan®. Severe toxicities have been reported with oral, rectal, and even dermal exposures. Benzocaine concentrations in many topical creams can be as high as 20%; as a result, it is not difficult to deliver a dose that can lead to toxicity.

The main toxic effect seen with the use of benzocaine products is methemoglobinemia. Methemoglobin is an oxidized form of hemoglobin incapable of binding to oxygen. When its concentration increases in red blood cells, tissue hypoxia can occur. Methhemoglobinemia also causes tachycardia, hypotension, hyperpnea, cyanosis, lethargy, and metabolic acidosis.

Methemoglobin is measured by co-oximetry. Pulse oximetry readings should *not* be used as criteria for initiating treatment because findings are misleading and portray an inaccurate depiction of hemoglobin oxygen-carrying capacity. All patients with symptomatic methemoglobinemia or methemoglobin levels greater than 20 percent should be admitted for treatment. Therapy consists of supportive measures, prevention of further absorption of methemoglobin-inducing agents, oxygen, and administration of methylene blue (reduces methemoglobin to hemoglobin) at 1-2 mg/kg/dose IV over 5 minutes with 30 mL flush of normal saline as needed every 4 hours. All symptomatic patients should be treated with methylene blue. It should be used with caution in G-6-PD deficient patients as it may cause hemolysis. Methylene blue is not likely to be effective if the patient is methemoglobin reductase deficient. Adverse effects of methylene blue include hypotension, vomiting, excessive sweating, anxiety, chest pain, hemolytic anemia, and blue-green urine. Severely toxic patients unresponsive to methylene blue should be treated with hyperbaric oxygen as adjunctive therapy and should be considered as candidates for exchange transfusion.

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DID YOU KNOW THAT… *methemoglobinemia can also be caused by other agents?*

Methemoglobinemia can also be induced by other agents that are commonly prescribed and used. A particularly common drug used as a genitourinary analgesic, phenazopyridine, has been associated with a number of cases of toxicity manifesting as methemoglobinemia in patients with acute overdose or chronic therapeutic use. Lidocaine, primaquine, chloroquine, nitroglycerin, sulfonamides, cyclophosphamide, dapsone, and nitroprusside are just some of the other drugs that can increase methemoglobin levels. If you suspect a patient is experiencing signs and symptoms of methemoglobinemia, contact the Maryland Poison Center at 1-800-222-1222.

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