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Barium Toxicity - A Rare Presentation of Fireworks Ingestion

Barium toxicity is reported in exposure to explosives, fireworks, chemical compounds and presents as severe hypokalemia due to redistribution of potassium in the body. We report a 16-year-old boy who ingested fireworks and presented with acute quadriplegia and respiratory failure due to severe hypokalemia. He had gastroenteritis, pain abdomen, difficulty in breathing, and generalized weakness. Investigations showed serum potassium of 0.2 meq/L. He was ventilated and received rapid potassium correction. He subsequently developed ventricular tachycardia, which reverted with rapid potassium infusion. A total of 360 meq of potassium was supplemented in first 20 hours. He regained complete muscle power by day 3. Barium nitrate, commonly used in fireworks, is highly toxic and can lead to hypokalemia. We suspected barium poisoning in our index case and samples of blood and urine were sent for toxicological analysis. Blood barium levels were 98.5 mcg/dL (normal 3-20 mcg/dL).

Barium compounds are highly toxic when ingested with the exception of barium sulphate which is not absorbed from gut and hence commonly used as radiographic contrast. Fireworks contain Barium chlorate and nitrate which gives the yellow green flame on igniting [1]. Barium interferes with potassium transport, causing intracellular sequestration of the ion and severe

hypokalemia. Effects of barium include gastroenteritis, cardiac instability, wide complex arrhythmias, muscle weakness, hypertension and respiratory failure [1-4]. Renal toxicity with ingestion of large amounts of barium is also reported [5]. Barium carbonate poisoning from rodenticide ingestion has been reported to cause acute rhabdomyolysis and hypophosphatemia. No specific antidote is known for barium toxicity. Patients requires large doses of potassium supplementation and respiratory support [1-5]. Use of oral magnesium sulphate to form barium sulphate prevents further absorption of barium from GI tract. In refractory cases with cardiac instability or renal toxicity hemodialysis can be effective [5].

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