

A CASE OF SALBUTAMOL POISONING WITH HYPOGLYCEMIA

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Abstract :

Salbutamol, also known as albuterol is a Beta agonist that [opens up the medium and large airways in the lungs](#). It is used to treat [asthma](#) including [asthma attacks](#), [exercise-induced bronchoconstriction](#), and [chronic obstructive pulmonary disease](#). The most common side effects are fine [tremor](#), [anxiety](#), [headache](#), [muscle cramps](#), [dry mouth](#), and [palpitations](#). In higher doses it causes hypokalemia leading to ECG changes and arrhythmias. Here we are reporting a case of 13 year female with intentional consumption of 20 tablets asthalin and presented with vomiting, tremors, tachycardia, hypotension and blood glucose level of 208 mg/dl. Gastric lavage, activated charcoal, intravenous hydration and electrocardiogram (ECG) were performed. She had 1 episode of hypoglycemia 4 hours after hospital admission. Her plasma potassium level, blood sugar and QT interval were closely monitored during hospitalisation and was discharged after 72 hours.

Introduction : Salbutamol is a commonly used and easily available drug. It is most commonly used for asthma. Salbutamol is sold as a racemic mixture. The (R)-(-)-enantiomer is responsible for the pharmacologic activity; the (S)-(+)-enantiomer (bottom) blocks metabolic pathways associated

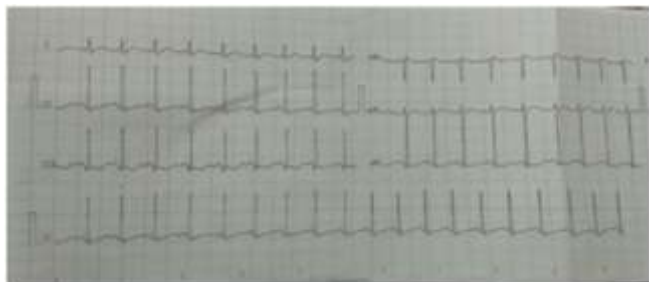
with elimination of itself and of the pharmacologically active enantiomer.⁽¹⁾ Commercially it is available as 2 and 4 mg tablets. Toxicity occurs after ingestion of more than 1 mg/kg/dose. Common symptoms and signs of overdose are agitation, vomiting, tachycardia, widened pulse pressure, hyperglycemia, and hypokalemia.⁽²⁾

Case report : A 13 year female brought to casualty with history of consumption of 20 tablets of Asthalin (Salbutamol) half hour ago. She was complaining of tremors, palpitation and nausea. On examination, she was conscious and co-operative. Her heart rate was 122 beats per minute, Respiratory rate of 24 cycles per minute and blood pressure of 94/52 mm of Hg and temperature of 98.5 degree Fahrenheit. Her blood glucose was 208 mg/dl. On systemic examination of cardiovascular system she had tachycardia. On examination of respiratory system, air entry was bilaterally equal. On Per abdomen, no significant finding. On examination of central nervous system, she had mild tremors and no other positive finding.

The patient was admitted and a through stomach wash was given with activated charcoal. IV access was obtained and fluids were started on full maintenance. Her basic blood investigations including complete blood count and liver and renal function tests were normal. Her serum sodium was normal but serum potassium was 2.9 mg/dl. Her clinical parameters, vital signs and ECG and BSL were continuously monitored. Blood glucose and serum potassium were monitored 4 hourly.

Hypokalemia was asymptomatic all through and serum potassium was 4.8 mEq/L 12 hours after the admission. Her blood glucose dropped down to 33 mg/dl 4 hours after admission but after giving a bolus of 2 ml/kg of 10% dextrose stat, her blood glucose was maintained throughout the course of hospital admission. She was kept Nil per oral for initial 24 hours and hydration maintained by IV fluid with potassium chloride. Oral feed was started the next day and potassium chloride discontinued after

serum potassium normalised. Her tremors stopped within 24 hours. She was discharged 72 hours after the admission when her blood glucose level and ECG were normalised.



Sinus tachycardia

Discussion : Salbutamol is a short-acting beta-2 adrenergic agonist that is primarily used as a bronchodilator agent to treat ASTHMA. Albuterol is prepared as a racemic mixture of R(-) and S(+) stereoisomers. Albuterol stimulates beta-2 adrenergic receptors in the lungs, thereby activating the enzyme adenylate cyclase that catalyzes the conversion of adenosine triphosphate (ATP) to cyclic-3',5'-adenosine monophosphate (cAMP). Increased cAMP concentrations relax bronchial smooth muscle, relieve bronchospasms, and reduce inflammatory cell mediator release.⁽³⁾

The toxicity dose is when more than 1 mg/kg of salbutamol is consumed. It clinically manifests with tachycardia, tremors, palpitations, nausea, vomiting, hypotension and hypokalemia. Hypokalemia can lead to tachycardia and arrhythmias.⁽⁴⁾ The treatment is to initially decontamination by gastric lavage with activated charcoal. Maintenance of hydration by IV access. Monitoring for blood pressure, blood glucose levels, ECG and levels of serum potassium. Most of the cases present with hyperglycemia but few cases can present with hypoglycemia when the effect of drug wanes off and there is reflex secretion of insulin due to hyperglycemia. Intravenous potassium chloride is given if hypokalemia is symptomatic.⁽⁵⁾

No specific antidote is available for salbutamol poisoning and treatment is symptomatic

management of the patient till the potassium and blood glucose and blood pressure levels normalise. Though most of the cases present with hyperglycemia, hypoglycemia can rarely be a presentation in case of salbutamol poisoning. Hence meticulous and prolonged monitoring is of paramount importance in such cases.⁽⁶⁾

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