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THE MARYLAND POISON CENTER'S MONTHLY UPDATE.
NEWS. ADVANCES. INFORMATION

ACE Inhibitor Overdoses

Angiotensin converting enzyme (ACE) inhibitors, such as lisinopril, enalapril, ramipril, benazepril, and captopril, block the conversion of angiotensin I to angiotensin II, thereby lowering arteriolar resistance and subsequently reducing blood pressure. Overdoses have been widely reported and mild toxicity may be produced with a single, supra-therapeutic dose; however, severe toxic effects and deaths rarely occur and are often attributed to co-ingestants. There are reports of children 6 years of age and younger who have ingested up to 8mg/kg captopril or up to 2mg/kg enalapril or lisinopril and remained asymptomatic. Most pediatric ingestions may be managed at home.

It's well known that cough, angioedema and bronchoconstriction are adverse effects with therapeutic use of ACE inhibitors. However, the primary toxic effect of ACE inhibitors in overdoses is an extension of their pharmacologic effect (hypotension). Aldosterone promotes excretion of potassium and because ACE inhibitors decrease the release of aldosterone, potassium may accumulate in the body causing clinically significant hyperkalemia. Potassium retention enhances sodium excretion producing hyponatremia. Acute renal failure has rarely been reported in hypotensive patients. Monitoring of BUN and serum creatinine is important, particularly if significant hypotension is present or if the patient has preexisting renal disease, congestive heart failure or hypovolemia.

Asymptomatic patients should be observed for at least four hours post ingestion with frequent monitoring of vital signs. Symptomatic or hypotensive patients should be admitted for at least 24 hours post ingestion or until symptoms have completely resolved. Patients should be given adequate IV fluids to maintain a satisfactory blood pressure and a good urine output. Oral activated charcoal may be given to patients who have ingested a large overdose, given they present within 1-2 hours. ACE inhibitors may also inhibit the metabolism of enkephalins and potentiate their opioid effect which includes lowering of blood pressure. Naloxone, an opioid receptor antagonist, has been shown to increase blood pressure in ACE inhibitor overdoses. Although the role of naloxone in the setting of ACE inhibitor overdose remains unclear, it may be considered, especially in cases of severe hypotension where fluid overload is a concern.

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Did you know?

2012 marks the 40th anniversary of the Maryland Poison Center!

Since 1972, the mission of the Maryland Poison Center has been to save lives and save dollars by providing triage and treatment recommendations, education, and prevention services to the public and health care providers in our state. You've probably noticed that ToxTidbits has a new design...look for other newly designed education materials and a new website in 2012. One thing that won't change... 24/7 expert advice from our pharmacists and nurses who are nationally certified as Specialists in Poison Information!

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