ACE Inhibitor Toxicity

ACE inhibitors are indicated for the treatment of hypertension, CHF, and diabetic nephropathy, and have several common toxicities. These toxicities include cough, angioedema, potassium changes, taste changes, hypotension, and pregnancy changes. Rash may also occur, along with increased renin and lower angiotensin II. As these drugs lower aldosterone, K⁺ is not secreted into the collecting duct, and patients may develop hyperkalemia.



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CAPTOPRIL Mnemonic
Captain-Pearl
The CAPTOPRIL mnemonic can be used to remember the side effects of ACE inhibitors: cough, angioedema, potassium changes, taste change, hyp-O-tension, pregnancy changes, rash, increased renin, and lower angiotensin II. Another side effect is hyperkalemia.

Cough
Coughing Coffee-pot
ACE inhibitors may cause a persistant dry cough, associated with the increased levels of bradykinin seen in patients.

Angioedema
Angel-edamame
These drugs are a leading cause of drug-induced angioedema, frequently due to increased bradykinin levels. This is seen especially in patients with genetic predisposition to degrade bradykinin more slowly.

Potassium Changes (Hyperkalemia)
Hiker-banana
ACE inhibitors may cause hyperkalemia, as decreased angiotensin also leads to decreased aldosterone. Aldosterone promotes excretion of potassium, so its inhibition leads to greater retention of these ions.

Taste Change
Tongue with Delta-sign
A possible toxicity includes taste abnormalities, associated with the sulfhydryl group found in ACE inhibitors. This side effect is more commonly seen with high doses of captopril.

Hypotension
Hippo-BP
Patients may experience hypotension, causing weakness, syncope or dizziness. Risk of these side effects may be minimized with a very low initial dose.

Pregnancy Changes
Pregnant-woman with Delta-sign
ACE inhibitors may pose significant risks throughout all stages of pregnancy, especially if exposure occurs during the first trimester. Anomalies include stillbirths, fetal renal damage and congenital malformations.

Rash
Dermatologist examining Rash
Rash may be seen with high doses of captopril, and is associated with the sulfhydryl group found in ACE inhibitors. Decreasing the maximum dose have made sulfhydryl-related complications less common.

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Increased Renin

Up-arrow Wrenches

Increased renin concentrations in the blood may occur due to negative feedback of angiotensin I to angiotensin II conversion.

Lower Angiotensin II

Down-arrow Angel-tennis with (2) Tutu

These drugs inhibit angiotensin converting enzyme, which is responsible for the conversion of angiotensin I to angiotensin II.

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