Adenosine (a-den-o-sen)

Adenocard, Adenoscan

Classification
Therapeutic: antiarrhythmics

Pregnancy Category C

Indications
Conversion of paroxysmal supraventricular tachycardia (PSVT) to normal sinus rhythm when vagal maneuvers are unsuccessful. As a diagnostic agent (with noninvasive techniques) in known myocardial perfusion defects occurring as a consequence of coronary artery disease.

Action
Restores normal sinus rhythm by interrupting re-entrant pathways in the AV node. Slows conduction time through the AV node. Also produces coronary artery vasodilation.

Therapeutic Effects:
Restoration of normal sinus rhythm.

Pharmacokinetics
Absorption:
Following IV administration, absorption is complete.

Distribution:
Take up by erythrocytes and vascular endothelium.

Metabolism and Excretion:
Rapidly converted to inosine and adenosine monophosphate.

Half-life:
10 sec.

TIME/ACTION PROFILE (antiarrhythmic effect)

ROUTE ONSET PEAK DURATION
IV immediate unknown 1–2 min

Contraindications/Precautions
Contraindicated in:
Hypersensitivity; 2nd- or 3rd-degree AV block or sick sinus syndrome, unless a functional artificial pacemaker is present.

Use Cautiously in:
Patients with a history of asthma (may induce bronchospasm); Unstable angina; OB, Lactation: Safety not established.

Adverse Reactions/Side Effects
CNS:
Apprehension, dizziness, headache, head pressure, light-headedness.

EENT:
Blurred vision, throat tightness.

Resp:
Shortness of breath, chest pressure, hyperventilation.

CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations, GI:
Nausea, vomiting, diarrhea, abdominal discomfort, vomiting, hyperventilation, CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations,
GI:
Nausea, vomiting, diarrhea, abdominal discomfort, vomiting,
Resp:
Shortness of breath, chest pressure, hyperventilation,
CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations,
GI:
Nausea, vomiting, diarrhea, abdominal discomfort, vomiting,
Resp:
Shortness of breath, chest pressure, hyperventilation,
CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations,
GI:
Nausea, vomiting, diarrhea, abdominal discomfort, vomiting,
Resp:
Shortness of breath, chest pressure, hyperventilation,
CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations,
GI:
Nausea, vomiting, diarrhea, abdominal discomfort, vomiting,
Resp:
Shortness of breath, chest pressure, hyperventilation,
CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations,
GI:
Nausea, vomiting, diarrhea, abdominal discomfort, vomiting,
Resp:
Shortness of breath, chest pressure, hyperventilation,
CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations,
GI:
Nausea, vomiting, diarrhea, abdominal discomfort, vomiting,
Resp:
Shortness of breath, chest pressure, hyperventilation,
CV:
Facial flushing, transient arrhythmias, chest pain, hypotension, palpitations,

Interactions
Drug-Drug: Carbamazepine may ↑ risk of progressive heart block. Diprydiamole ↓ effects of adenosine (dose of adenosine recommended). Effects of adenosine ↓ by theophylline or caffeine (doses of adenosine may be required). Concurrent use with digoxin may ↑ risk of ventricular fibrillation.

Route/Dosage
IV (Adults and Children <50 kg): Antiarrhythmic—6 mg by rapid IV bolus; if no results, repeat 1–2 min later as 12-mg rapid bolus. This dose may be repeated (single dose not to exceed 12 mg). Diagnostic use—140 mcg/kg/min for 6 min (0.84 mg/kg total).

IV (Children <50 kg): Antiarrhythmic—0.05–0.1 mg/kg as a rapid bolus, may repeat in 1–2 min; if response is inadequate, may increase by 0.05–0.1 mg/kg until sinus rhythm is established or maximum dose of 0.3 mg/kg is used.

NURSING IMPLICATIONS
Assessment
• Monitor heart rate frequently (every 15–30 sec) and EKG continuously during therapy. A short, transient period of 1st-, 2nd-, or 3rd-degree AV block or asystole may occur following injection; usually resolves quickly due to short duration of adenosine. Once conversion to normal sinus rhythm is achieved, transient arrhythmias (presumptive ventricular contractions, atrial premature contractions, sinus tachycardia, sinus bradycardia, skipped beats, AV nodal block) may recur, but generally last a few seconds.
• Monitor BP during therapy.
• Assess respiratory status (breath sounds, rate) following administration. Patients with a history of asthma may experience bronchospasm. Patients with history of asthmatic experience bronchospasm.

Potential Nursing Diagnoses
Decreased cardiac output (Indications)

NURSING IMPLICATIONS
Assessment
• Monitor heart rate frequently (every 15–30 sec) and EKG continuously during therapy. A short, transient period of 1st-, 2nd-, or 3rd-degree AV block or asystole may occur following injection; usually resolves quickly due to short duration of adenosine. Once conversion to normal sinus rhythm is achieved, transient arrhythmias (presumptive ventricular contractions, atrial premature contractions, sinus tachycardia, sinus bradycardia, skipped beats, AV nodal block) may recur, but generally last a few seconds.
• Monitor BP during therapy.
• Assess respiratory status (breath sounds, rate) following administration. Patients with a history of asthma may experience bronchospasm. Patients with a history of asthmatic experience bronchospasm.

Potential Nursing Diagnoses
Decreased cardiac output (Indications)

NURSING IMPLICATIONS
Assessment
• Monitor heart rate frequently (every 15–30 sec) and EKG continuously during therapy. A short, transient period of 1st-, 2nd-, or 3rd-degree AV block or asystole may occur following injection; usually resolves quickly due to short duration of adenosine. Once conversion to normal sinus rhythm is achieved, transient arrhythmias (presumptive ventricular contractions, atrial premature contractions, sinus tachycardia, sinus bradycardia, skipped beats, AV nodal block) may recur, but generally last a few seconds.
• Monitor BP during therapy.
• Assess respiratory status (breath sounds, rate) following administration. Patients with a history of asthma may experience bronchospasm. Patients with a history of asthmatic experience bronchospasm.
Implementation

IV Administration

- **pH:** 4.5–7.5.
- **IV:** Crystals may occur if adenosine is refrigerated. Warm to room temperature to dissolve crystals. Solution must be clear before use. Do not administer solutions that are discolored or contain particulate matter. Discard unused portions.
- **Direct IV:** **Diluent:** Administer undiluted. **Concentration:** 5 mg/mL. **Rate:** Administer over 1–2 seconds via peripheral IV as proximal as possible to trunk. Slow administration may cause increased heart rate in response to vasodilation. Follow each dose with 20 mL rapid saline flush to ensure injection reaches systemic circulation.
- **Intermittent Infusion (for use in diagnostic testing):** **Diluent:** Administer 30 mL undiluted. **Concentration:** 5 mg/mL. **Rate:** Administer at a rate of 140 mcg/kg/min for a total dose of 0.84 mg/kg. Thallium-201 should be injected as close to the venous access as possible at the midpoint (after 3 min) of the infusion.

Patient/Family Teaching

- Caution patient to change positions slowly to minimize orthostatic hypotension.
- Instruct patient to report facial flushing, shortness of breath, or dizziness.

Evaluation/Desired Outcomes

- Conversion of supraventricular tachycardia to normal sinus rhythm.
- Diagnosis of myocardial perfusion defects.

Why was this drug prescribed for your patient?