edrophonium (e-droh-four-ee-um)

**Silent, Tension**

**Classification**
- Therapeutic: anticholinesterase
- Pharmacologic: anticholinesterases, cholinergics

**Pregnancy Category C**

**Indications**
- Diagnosis of myasthenia gravis.
- Assessment of adequacy of anticholinesterase therapy in myasthenia gravis.
- Differentiating myasthenic from cholinergic crisis.
- Reversal of muscle paralysis from nondepolarizing neuromuscular blocking agents.

**Action**
- Inhibits the breakdown of acetylcholine so that it accumulates and has a prolonged effect. Effects include miosis; increased intestinal and skeletal muscle tone; bronchial constriction; bradycardia; increased salivation, lacrimation, and sweating.

**Therapeutic Effects:** Short-lived improvement in muscular function in patients with myasthenia gravis. Reversal of nondepolarizing neuromuscular blocking agents.

**Pharmacokinetics**
- **Absorption:** Absorption following IM and subcut administration not known.
- **Distribution:** 1.1 L/kg.
- **Metabolism and Excretion:** Unknown.
- **Half-life:** 73–126 min.

**TIME/ACTION PROFILE (cholinergic activity)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM</td>
<td>2–10 min</td>
<td>unknown</td>
<td>5–30 min</td>
</tr>
<tr>
<td>IV</td>
<td>30–60 sec</td>
<td>unknown</td>
<td>10 min</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**

**Contraindicated in:**
- Hypersensitivity
- Mechanical obstruction of the GI or GU tract
- Hypersensitivity to bisulfites

**Use Cautiously in:**
- History of asthma
- Cardiovascular disease
- Because some patients may be extremely sensitive to the effects of anticholinesterases, atropine should be available in case of excessive dosage.

**Adverse Reactions/Side Effects**

- **CNS:** Seizures, dizziness, dysphasia, dysphonia, weakness.
- **EENT:** Diplopia, lacrimation, miosis.
- **Resp:** Bronchospasm, excess secretions.
- **CV:** Bradycardia, hypotension.
- **GI:** Diarrhea, abdominal cramps, dysphagia, excess salivation, vomiting, nausea.
- **GU:** Incontinence, urinary frequency.
- **Derm:** Sweating, rashes.
- **MS:** Fasciculation.

**Interactions**
- **Drug-Drug:** Action may be antagonized by drugs possessing anticholinergic properties, including antihistamines, antidepressants, atropine, haloperidol, phenothiazines, quinidine, and disopyramide. Prolongation of depolarizing muscle-relaxing agents (succinylcholine, decamethonium) may result. Bradycardia in patients receiving digoxin.

**Route/Dosage**

**Diagnosis of Myasthenia Gravis**
- **IV (Adults):** 2 mg; if no response, administer an additional 8 mg after 45 sec; may repeat test in 30 min. If cholinergic response occurs after initial 2 mg dose, administer atropine 0.4–0.5 mg IV. Patients >50 yr should be pretreated with atropine to prevent bradycardia/hypotension.
- **IV (Children >34 kg):** 2 mg; if no response after 45 sec, may administer 1 mg every 45–60 sec to a total of 10 mg.
- **IV (Children 34 kg):** 1 mg; if no response after 45 sec, may administer 1 mg every 45 sec to a total of 5 mg.
- **IV (Infants):** 0.5 mg.

**Assessment of Anticholinesterase Therapy**
- **IV (Adults):** 1–2 mg 1 hr after oral anticholinesterase dose.
Differentiation of Cholinergic from Myasthenic Crisis

IV (Adults): 1 mg; may give additional 1 mg 1 min later.

Reversal of Nondepolarizing Neuromuscular Blocking Agents

IV (Adults): 10 mg; may repeat as needed (not to exceed 40 mg). Doses of 0.5–1 mg/kg have been used.

NURSING IMPLICATIONS

Assessment

- Assess neuromuscular status (ptosis, diplopia, vital capacity, ability to swallow, extremity strength) prior to and immediately after administration.
- Reversal of nondepolarizing neuromuscular blocking agents is more rapid in pediatric patients.
- To differentiate myasthenic from cholinergic crisis, assess for increased weakness, diaphoresis, increased saliva and bronchial secretions, dyspnea, nausea, vomiting, diarrhea, and bradycardia. If these symptoms occur after administration of edrophonium, patient is in cholinergic crisis. If strength improves after administration of edrophonium, patient is in myasthenic crisis.

Toxicity and Overdose: Atropine may be used for treatment of cholinergic symptoms. Oxygen and resuscitation equipment should be available.

Potential Nursing Diagnoses

Ineffective breathing pattern (Indications)

Implementation

- For myasthenia gravis patients, diagnostic IV dose and dose to differentiate myasthenic from cholinergic crisis should be administered by a physician.
- Direct IV: Diltiazem: Administer undiluted with a tuberculin syringe. Concentration: 10 mg/mL. Rate: Administration does over 30–45 sec.
- Y-Site Compatibility: heparin, hydrocortisone, potassium chloride, vitamin B complex with C

Patient/Family Teaching

- Informs patient that the effects of this medication last up to 30 min.

Evaluation/Desired Outcomes

- Relief of myasthenic symptoms.
- Differentiation of myasthenic from cholinergic crisis.
- Reversal of paralysis after anesthesia.

Why was this drug prescribed for your patient?

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