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ketamine (ket-a-meen)
Ketalar

Classification
Therapeutic: general anesthetics
Pregnancy Category UK

Indications
Anesthesia for short-term diagnostic and surgical procedures. As induction before the use of other anesthetics. As a supplement to other anesthetics. Unlabeled Use: Prophylaxis iodination and analgesia.

Action
Blocks afferent impulses of pain perception. Suppresses spinal cord activity. Affects CNS transmitter systems.

Therapeutic Effects:
Anesthesia with profound analgesia, minimal respiratory depression, and minimal skeletal muscle relaxation.

Pharmacokinetics
Absorption: Rapidly absorbed after IM administration.
Distribution: Rapidly distributed. Enters the CNS; crosses the placenta.
Metabolism and Excretion: Mostly metabolized by the liver. Some conversion to another active compound.
Half-life: 2.5 hr.

TIME/ACTION PROFILE (anesthesia)

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>30 sec</td>
<td>unknown</td>
<td>5–10 min</td>
</tr>
<tr>
<td>IM</td>
<td>3–4 min</td>
<td>unknown</td>
<td>12–25 min</td>
</tr>
</tbody>
</table>

Contraindications/Precautions
Contraindicated in: Hypersensitivity; Psychiatric disturbances; Hypertension; ↑ intracranial pressure; OB, Lactation: Pregnancy or lactation.

Use Cautiously in: Cardiovascular disease; Procedures involving larynx, pharynx, or bronchial tree (muscle relaxants required); Gastroesophageal reflux; Hepatic dysfunction; History of alcohol abuse; Cerebral trauma; Intracerebral mass or hemorrhage; Hyperthyroidism; History of psychiatric problems; ↑ intramuscular pressure; Severe respiratory disease.

Adverse Reactions/Overdose
CNS: emergence reactions, ↑ intracranial pressure, encephalopathy, respiratory depression and apnea (rapid IV administration of large doses, CNS), hypotension, respiratory arrest, chest pain, bradycardia, hypotension, GI: excessive salivation, nystagmus, vomiting, MI, cyanosis, tachycardia, Local pain at injection site, MI, ↑ skeletal muscle tone.

Interactions
Drug-Drug: Use with barbiturates, hydroxyzine, and opioid analgesics may result in prolonged recovery time. Use with halothane may result in ↓ BP, cardiac output, and heart rate. Use with lidocaine or nondepolarizing neuromuscular blocking agents may result in prolonged respiratory depression. Concurrent use with thyroid hormone ↑ risk of tachycardia and hypertension. Concurrent administration with diazepam may ↑ incidence of emergence reactions. Concurrent administration with atropine may ↑ incidence of unpleasant dreams.

Route/Dosage

General Anesthesia
IV (Adults): Induction—1–2 mg/kg (range 1–4.5 mg/kg)—2 mg produces 5–10 min of surgical anesthesia or 1–2 mg/kg as a single injection or infused at 0.5 mg/min. May be used with concurrent diazepam. Maintenance—Increments of 0.5 to the full induction dose may be repeated as needed. If pain with concurrent diazepam, an infusion of 0.1–0.5 mg/min may be used, augmented by 2–5 mg doses of diazepam. IV (Children): 0.5–1 mg/kg, use smaller doses (0.5–1 mg/kg/liter) minor procedures.

IM (Adults): 3–8 mg/kg (10 mg/kg produces 12–25 min of surgical anesthesia).

Sedation/Analgesia (Unlabeled)

IV (Adults): 200–750 mcg (0.2–0.75 mg)/kg over 2–3 min initially, followed by 5–20 mcg (0.005–0.02 mg)/kg/min as an infusion.
IV (Children): 5–20 mcg/kg/min.

IM (Adults): 2–4 mg/kg initially, then 5–20 mcg (0.005–0.02 mg)/kg/min as an IV infusion.

NURSING IMPLICATIONS

Assessment

● Assess level of consciousness frequently throughout therapy. Ketamine produces a dissociative state. The patient does not appear to be asleep and experiences a feeling of dissociation from the environment.

● Monitor HR, BP, and respiratory status frequently throughout therapy. May cause hypotension and tachycardia. May cause increased CPP, increased IOP.

● Toxicity and Overdose: Respiratory depression or apnea may be treated with mechanical ventilation or analeptics.

Potential Nursing Diagnoses

Risk for injury (Side Effects)
Disturbed sensory perception (Adverse Reactions)

Implementation

● Do not confuse Ketalar (ketamine) with ketorolac.

● Administer on an empty stomach to prevent vomiting and aspiration.

● May be administered concurrently with a drying agent (atropine, scopolamine); ketamine increases saliva and tracheobronchial mucous gland secretions. Atropine may also increase the incidence of unpleasant dreams.

● Patients may experience a state of confusion (emergence delirium) during recovery from ketamine. Administering a benzodiazepine and minimizing verbal, tactile, and visual stimulation may prevent emergence delirium. Severe emergence delirium may be treated with short- or ultra-short-acting barbiturates.

● PO: Use 100 mg/mL IV solution and mix appropriate dose in 0.2–0.3 mL/kg of cola or other beverage.

IV Administration

● Direct IV: Dilute 100 mg/mL concentration with equal parts of sterile water for injection, 0.9% NaCl, or D5W. Concentration: Maximum concentration for slow IV push 50 mg/mL. Rate: Administration over 60 sec unless a rapid-sequence induction technique is indicated. More rapid administration may cause respiratory depression, apnea, and hypertension. Do not exceed 0.5 mg/kg/min.

● Continuous Infusion: Dilute: Dilute 10 mL of 50 mg/mL concentration with 50 mL of 0.9% NaCl or D5W and run with.

Concentration: 1 mg/mL. Infusion with 200 mL may be used if fluid restrictions is needed, for a maximum concentration of 2 mg/mL. Rate: Administer at a rate of 0.5 mg/kg/min for induction. Maintenance infusions may be administered at a rate of 1–2 mg/min or 0.1–0.5 mg/min given concurrently with diazepam. Dose must be titrated according to individual patient requirements. Tonic-clonic movements during anesthesia do not indicate the need for more ketamine.

● Y-Site Compatibility: albunin, amikacin, amiodarone, atropine, calcium chloride, calcium gluconate, cefazolin, cefepime, ceftriaxone, cefuroxime, cefotaxime, clindamycin, clonidine, dopamine, epinephrine, esmolol, fentanyl, hydrocortisone, hydromorphone, midazolam, morphine, norepinephrine, ondansetron, pancuronium, propofol, potassium chloride, sodium bicarbonate, sufentanil, tobramycin, vancomycin.

● Y-Site Incompatibility: acyclovir, ampicillin, bupivacaine, heparin, insulin, meperidine, metoclopramide, metronidazole, midazolam, morphine, methohexital, sodium, succinylcholine, pancuronium, pipacillin/tazobactam.

Patient/Family Teaching

● Psychomotor impairment may last for 24 hr after anesthesia. Caution patient to avoid driving or other activity requiring alertness until response to medication is known.

● Advise patients to avoid alcohol or other CNS depressants for 24 hr after anesthesia.

Evaluation/Desired Outcomes

● Sense of dissociation and general anesthesia without muscle relaxation.

Why was this drug prescribed for your patient?