

Southern Illinois Regional EMS System

JJ-19 MAGNESIUM SULFATE

1. Class:
 - 1.1. Electrolyte, anticonvulsant.
2. Description:
 - 2.1. Magnesium sulfate reduces strained muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction. In emergency care, magnesium sulfate is used in the management of seizures associated with toxemia of pregnancy. Other uses of magnesium sulfate include uterine relaxation (to inhibit contractions of premature labor), as a bronchodilator after beta-agonist and anticholinergic agents have been used, and replacement therapy for magnesium deficiency. Magnesium sulfate is gaining popularity as an initial treatment in the management of various dysrhythmias caused by tricyclic antidepressant overdose or digitalis toxicity. The drug also is considered as a Class IIA agent (American Heart Association guidelines; probably helpful) for ventricular fibrillation/ventricular tachycardia refractory to Lidocaine.
3. Onset and Duration:
 - 3.1. Onset:
 - 3.1.1. IV Immediate.
 - 3.1.2. IM 1 hour.
 - 3.2. Duration:
 - 3.2.1. IV 30 minutes.
 - 3.2.2. IM 3-4 hours.
4. Indications:
 - 4.1. Seizures of eclampsia (toxemia of pregnancy).
 - 4.2. Torsades de pointes.
 - 4.3. Suspected hypomagnesemia.
 - 4.4. Refractory ventricular fibrillation.
 - 4.5. Status asthmaticus not responsive to beta-adrenergic drugs.
5. Contraindications:
 - 5.1. Heart block.
 - 5.2. Myocardial damage.
6. Adverse Reactions:
 - 6.1. Diaphoresis.
 - 6.2. Facial flushing.
 - 6.3. Hypotension.
 - 6.4. Depressed reflexes.
 - 6.5. Hypothermia.
 - 6.6. Reduced heart rate.
 - 6.7. Circulatory collapse.
 - 6.8. Respiratory depression.
 - 6.9. Diarrhea.

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(continued)

7. Drug Interactions:
 - 7.1. Central nervous system depressant effects may be enhanced if the patient is taking other central nervous system depressants.
 - 7.2. Serious changes in cardiac function may occur with cardiac glycosides (avoid excess magnesium administration).
8. How Supplied:
 - 8.1. 10%, 12.5%, 50% solution in 40, 80, 100, and 125mg/ml.
9. Dosage and Administration:
 - 9.1. Seizure Activity Associated with Pregnancy:
 - 9.1.1. Adult:
 - 9.1.1.1. 1-4g (8-32mEq) IV – maximum dose 30-40g/day.
 - 9.2. Pulseless Arrest (for Hypomagnesemia or Torsades de Pointes):
 - 9.2.1. Adult:
 - 9.2.1.1. 1-2g (2-4ml of 50% solution) diluted in 10ml of NS, IV push.
 - 9.2.2. Pediatrics:
 - 9.2.2.1. 25-50mg/kg (maximum 2g) over 10-20 minutes.
 - 9.3. Torsades de Pointes (Not in Cardiac Arrest) and Myocardial Infarction (If Indicated):
 - 9.3.1. Adult:
 - 9.3.1.1. Loading dose of 1-2g in 50-100ml NS over 5-60 minutes IV.
 - 9.3.1.2. Follow with 0.5-1g/hour/IV (titrate dose to control the Torsades).
 - 9.3.2. Pediatrics:
 - 9.3.2.1. Same as pulseless arrest.
10. Special Considerations:
 - 10.1. Pregnancy Category B.
 - 10.2. Magnesium sulfate is administered for the treatment of toxemia of pregnancy:
 - 10.2.1. It is recommended that the medication not be administered in the 2 hours before delivery.
 - 10.2.2. IV calcium gluconate or calcium chloride should be available as an antagonist to magnesium if needed.
 - 10.3. Convulsions may occur up to 48 hours after delivery, necessitating continued therapy.
 - 10.4. The “cure” for toxemia is delivery of the baby.
 - 10.5. Magnesium must be used with caution in patients with renal failure because it is cleared by the kidneys and can reach toxic levels easily in those patients.