Mannitol

Classification

Osmotic diuretic

Indications

CCP: Reduction of intracranial pressure and cerebral edema

Contraindications

- Patients with well-established anuria as a result of severe renal disease, and who do not respond to two test doses
- Severe pulmonary congestion or frank pulmonary edema
- Severe congestive heart failure
- Dehydration states
- Metabolic edema associated with capillary fragility or membrane permeability
- Progressive renal disease

Adult dosages

CCP: Reduction of intracranial pressure and cerebral edema

- 1.5-2 g/kg IV infused as a 15%, 20%, or 25% solution
- 0.25 g/kg IV not more frequently than every 6-8 hours

Pediatric Considerations And Dosing

CCP: Reduction of intracranial pressure and cerebral edema

- 2 g/kg IV infused as a 15% or 20% solution

Mechanism Of Action

Mannitol increases extracellular fluid volume and dilutes extracellular stores of sodium, drawing water out of the cells into the plasma. Fluid shifts result in the reduction of cerebral edema and lowering of cerebrospinal fluid pressure.

Pharmocokinetics

Intravenous:

- CSF pressure is reduced within 15 minutes
- Diuresis generally develops after 1-3 hours
- Intraocular pressure reduces within 30-60 minutes

Adverse Effects

Mannitol use may disturb other fluid and electrolyte balances.

Overdose

Accumulation of mannitol caused by inadequate urinary output, or rapid adminsitration of large volumes, may result in the overexpansion of extracellular fluid and circulatory overload causing signs and symptoms of water intoxication. Overhydration may be corrected by hemodialysis, or administration of a diuretic.

Warning And Precautions

There is a risk of serious electrolyte disturbances, which may be severe enough to alter the acid-base balance, or to depress respirations. Thiazides may be used if hypernatremia, or hyperosmolality occurs.