Mannitol (Osmitrol)

Mannitol is an osmotic diuretic which works to increase urine flow. It is often used as an acute treatment until more definitive treatment can be procured. This holds true for its administration in cases of intracranial hypertension (usually from head trauma), primary open angle glaucoma and drug overdose. A side effect of mannitol use is dehydration, and patients should be monitored for this. It is contraindicated in anuria and CHF.



PLAY PICMONIC

Indications

Increased Intracranial Pressure (ICP)
Up-arrow Pressure-cooker Cranium
This drug is used for its osmotic properties to reduce acutely increased intracranial pressure, such as head trauma. Mannitol is often given in a bolus form until a more definitive treatment can be applied.

Glaucoma
Glock-eye
Mannitol is often used as an acute treatment in primary open angle glaucoma until a more definitive treatment can be used. This medication decreases intraocular pressure by decreasing vitreous humor volume. Mannitol does not cross the blood-ocular barrier and thus exerts oncotic pressure which dehydrates the vitreous.

Drug Overdose
Overdose-pill-bottle
As mannitol is an osmotic diuretic, it helps promote excretion of substances such as aspirin and barbiturates in overdose situations.

Mechanism of Action

Osmotic diuretic
Water Die-rocket
Mannitol is filtered by the kidney glomeruli, but is incapable of being reabsorbed from the renal tubule. This results in decreased water and Na+ reabsorption via its osmotic effect. Consequently, mannitol increases water and Na+ excretion, thereby decreasing extracellular fluid volume.

Increased Urine Flow
Up-arrow Urinal
Mannitol increases tubular fluid osmolarity, which leads to increased Na⁺ and water flow through the collecting duct, resulting in increased urine flow.

Side Effects

Dehydration
Empty-canteen
This drug promotes fluid loss and can lead to dehydration if patients are not adequately monitored.

Contraindications

Sign up for FREE at picmonic.com

Anuria

Anchor-urinal

This drug is contraindicated in anuric patients secondary to renal disease. Mannitol does not influence urine production, only enhances existing urine output. If there is no production (as in ARF) you would have hyperosmotic plasma due to mannitol since it would be trapped in that compartment (and thus be of no benefit and possible harm).

CHF

CHF Heart-balloon

Mannitol is contraindicated in CHF because this drug causes the retention of fluid in the plasma. It extracts water from the intracellular compartment and increases blood volume, which can worsen CHF and pulmonary edema.

Sign up for FREE at picmonic.com