DOPAMINE HYDROCHLORIDE

Action-
At varying dosages (low, medium, or high) dopamine hydrochloride stimulates alpha, beta and dopaminergic receptors to have differing effects on renal, cardiac or venous vasculature.

Dosages and these effects are as follows;
- **Low Dose** 2-5 microgram/kg/min
  Dopamine receptors may be selectively activated to stimulate renal and mesenteric vasodilation increasing urine output and sodium excretion. Blood pressure does not change.
- **Medium Dose** 5-10 microgram/kg/min
  β1 receptors are activated and cardiac output and systolic blood pressure increase.
- **High Dose** >10 microgram/kg/min
  α receptors are activated causing vasoconstriction and both systolic and diastolic blood pressure increase.

Indications
- Hypotension/ haemodynamic compromise due to myocardial infarction, trauma, sepsis or congestive cardiac failure.
- Persistent hypotension after correction of hypovoleamia.
- Increase mesenteric blood flow in mesenteric ischaemia.
- Oliguria secondary to renal blood flow impairment.

Presentation
200mg/5ml ampoule

Dosage and Administration
- Dopamine hydrochloride is a potent drug. It must be diluted before administration and administered into a large vein via a central venous line. Extravasation can result in tissue necrosis.
  - NB A peripheral line may be used for short periods until central venous access is available
- An arterial line should be inserted for accurate BP recordings
- Dopamine hydrochloride is calculated according to patient’s weight. See attached chart for rates of infusion and calculation.
- Dopamine hydrochloride 200mg is diluted into 100mL of sodium chloride 0.9% (2000mcg/mL).
- Dopamine is to be ordered on the fluid order chart including strength, fluid infusion rate (mLs/hr), and the corresponding drug infusion rate (microgam/kg/min).
- On the intravenous fluid orders obtain minimum and maximum rates for titration and MAP parameters. Titrate to effect as per prescribed therapeutic endpoints.
- The rate of infusion must be controlled by an infusion pump in order to prevent an inadvertent bolus or flush of infusate.
- Onset of action is five minutes and half life is two minutes.
- Avoid co- infusing with variable rate infusions. Use a dedicated IV line and clearly label the line, ie do not administer other drugs through the same line.
- The infusion is changed after 24 hours.

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DOPAMINE HYDROCHLORIDE  cont’d

Observations
- Continuous haemodynamic observation. ECG and oxygen saturation monitoring is required.
- Five minute blood pressure recordings until set parameters have been met then hourly observations.
- Hourly urine measures are required with an accurate recording of fluid input.

Adverse Effects
- Arrhythmias/ tachycardia
- Headache
- Vasoconstriction/ renal failure
- Nausea/ Vomiting
- May cause hypotension if incorrectly used.

Precautions
- Patients taking monoamine oxidase inhibitors or who have taken them in the last two weeks require a substantially reduced dose.
- Hypovoleamia should be fully corrected prior treatment with dopamine.
- Patients with preexisting peripheral vascular disease may be more susceptible to peripheral ischaemia due to vasoconstriction. Ischaemia may be reversed by decreasing the rate or discontinuation of the infusion or by intravenous administration of phentolamine.
- Care with ischaemic heart disease patients, as it may exacerbate ischaemia.
- Pregnancy Category; B3.
- Breastfeeding-dopamine is not recommended for breastfeeding mothers unless the expected benefits outweigh any potential risks.
- Extravasation can cause tissue necrosis when administered peripherally

References:
Product Information Leaflet
http://mims.hcn.net.au/ifmx-nsapi/mims-data/?Mlval=2MIMS_abbr_pi&product_code=245&product_name=Dopamine+Concentrate+%28Sterile%29+%28DBL%29
POWH policy on administration of Dopamine Hydrochloride.

RISK RATING: Low- review in 5 years

REVISION & APPROVAL HISTORY
Reviewed and Endorsed Therapeutic & Drug Utilisation Committee 14/10/14
Approved Quality & Patient Safety Committee 18/2/10
Reviewed and Endorsed Therapeutic & Drug Utilisation Committee 15/12/09
Approved Quality Council 21/11/05

FOR REVIEW : OCTOBER 2019
FLOW RATE (ML/HOUR) OF DOPAMINE

Below calculations based on: Dopamine 200mg in 100mL sodium chloride 0.9% IV solution.

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Calculation example:
Patient prescribed: 5 microgram/kg/minute
Patient weight: 70kg
Dilution: 200mg in 100mL

Rate = Dose (microgram) x Pt weight (kg) x 60 min x volume (mL) / 1000 x strength (mg)
Rate (mL/hour) = 5 x 70 x 60 x 100 / 1000 x 200
= 10.5 mL/hour