
Vasopressin: Use in Septic Shock in Critical Care [Unlicensed Indication]

Vasopressin is at Consultant Intensivist request only.

Background

Vasopressin (also called Argipressin) is Anti Diuretic Hormone (ADH) and improves blood pressure by constriction of vascular smooth muscle. The use of vasopressin in septic shock is suggested by the Surviving Sepsis Guidelines in cases where the use of noradrenaline is not achieving the target MAP, or as a noradrenaline sparing agent when noradrenaline doses are high.

Vasopressin may be **added** to noradrenaline in **resistant septic shock** where the noradrenaline dose has reached 0.5 mcg/kg/min or more and steroids have been considered.

Vasopressin is added with the aim of either raising the MAP or decreasing the noradrenaline dose.

Vasopressin is not to be used as the sole vasopressor in septic shock.

Cautions & Contraindications

Vasopressin should not be used in shock states not related to sepsis

It is contraindicated in:

- Vascular disease, particularly coronary artery disease
- Patients with signs of digital / peripheral ischaemia
- Low cardiac output states
- Bradycardia
- Splanchnic ischaemia
- Intravascular depletion

Adverse Effects & Monitoring

General monitoring is as for any patient requiring vasopressors. Consider Cardiac Output monitoring.

Peripheries: Peripheral ischaemia - monitor closely for any signs of reduced peripheral perfusion

CVS: Myocardial ischaemia, infarction and cardiac arrest, arrhythmias, bradycardia

GI: Gastrointestinal ischaemia, nausea, vomiting and abdominal cramps

Renal: Fluid retention

Weaning: Rebound hypotension on discontinuation – wean infusion off slowly (see below)

Method of administration

Vasopressin is stored in the fridge.

Administer as a continuous intravenous infusion via central venous access device. If access is limited, vasopressin is compatible with noradrenaline if the infusions meet close to the vascular access device.

The half-life of vasopressin is around 10-20 minutes so double pumping is **not** required when renewing the syringe.

Dilute one ampoule of 20 units to 50mL with glucose 5% to produce a solution of 20 units/50mL (0.4units per mL)

Dose

A low dose vasopressin infusion of up to 0.03units/minute (4.5mL/hour of the 0.4units/mL solution) is recommended by the Surviving Sepsis Guidelines. The dose may be titrated to between 0.01units/minute (1.5mL/hour) and 0.04units/minute (6mL/hour). Doses higher than 0.04units/minute are reserved for salvage therapy and must be discussed with the Consultant Intensivist.

Discontinuing the Infusion

As the patient's condition improves the vasopressin should be slowly weaned down and off before the noradrenaline is stopped. Reduce the vasopressin infusion by half every 30 minutes down to 0.01units/hour (1.5mL/hour) then stop.

Terlipressin as an alternative if Vasopressin is unavailable [Unlicensed Indication]

Cautions & Contraindications

As for vasopressin above

Adverse Effects & Monitoring

As for vasopressin above.

Method of administration

Terlipressin is stored in the fridge.

Administer as a continuous intravenous infusion via central venous access device.

This is a different method of administration to the IV boluses given for oesophageal varices.

Continuous infusion of terlipressin is associated with fewer adverse effects than intermittent boluses.

The half-life of terlipressin is around 4-6 hours so double pumping is **not** required when renewing the syringe.

Dilute one ampoule of 1mg to 50mL with glucose 5% or sodium chloride 0.9% to produce a solution of 1mg/50mL (0.02mg per mL)

Dose

Start infusion at 0.05mg/hour (2.5mL/hour of the 0.02mg/mL solution). Titrate up to 0.2mg/hour (10mL/hour) as necessary.

Terlipressin will take around 20-30 minutes to clinical effect.

Discontinuing the Infusion

As the patient's condition improves the terlipressin should be weaned down and off before the noradrenaline is stopped. Reduce the terlipressin infusion by half every 30 minutes down to 0.05units/hour (2.5mL/hour) then stop.

References:

- Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. Intensive Care Med (2017) 43:304–377
- Intensive Care Society. Medication Concentrations in Critical Care Areas 2010
- Injectable Medicines Guide Vasopressin Monograph. Accessed on 18/09/2017 via <http://medusa.wales.nhs.uk>
- Paw H and Shulman R (2010) Handbook of Drugs in Intensive Care (4th ed.) University Press, Cambridge.
- BNF online accessed on 18/09/2017.
- Summary of Product Characteristics Argipressin 20units/ml Solution for Injection. Concordia International last revised 24/01/2017
- Summary of Product Characteristics Variquel 0.2 mg/ml, solution for injection. Alliance Pharmaceuticals last revised 15/08/2016
- Martindale accessed via MedicinesComplete on 21/09/2017
- Neto, A.S. et al. 2012. Vasopressin and terlipressin in adult vasodilatory shock: a systematic review and meta-analysis of nine randomized controlled trials. Critical Care. 16: R154

The use of this guideline is subject to professional judgment and accountability. This guideline has been prepared carefully and in good faith for use within the Department of Critical Care at University Hospitals Sussex NHS Foundation Trust (which includes Royal Sussex County Hospital, Princess Royal Hospital, Worthing General Hospital and St Richard's Hospital).

The decision to implement this guideline is at the discretion of the on-call critical care consultant in conjunction with appropriate critical care medical / nursing staff.