Clonidine: Use as a sedative in Critical Care

Background
Clonidine is an alpha₂ receptor agonist which is licensed for the treatment of hypertension. Due to its sedative and antihypertensive effects, clonidine may also be used as an unlicensed treatment, with the consent of a Consultant Intensivist for:

- Alcohol withdrawal reactions
- Opiate withdrawal reactions
- Agitation with tachycardia and hypertension, especially during weaning from the ventilator.
- Autonomic storm after traumatic brain injury.
- As an additional sedative when adequate sedation cannot be maintained using standard drugs.

The half-life of clonidine is 10 – 20 hours, rising to up to 41 hours in end stage renal failure.

Cautions
Clonidine should be used with extreme caution in patients with hypotension, bradycardia, low cardiac output or impaired left ventricular function.

Enhanced hypotensive effects will be seen when other hypotensive drugs are given concurrently.

Concurrent use with haloperidol may produce QT prolongation.

Use with caution in Raynaud’s syndrome or other occlusive peripheral vascular disease.

Use with caution in patients with a history of depression as it can worsen the condition.

Unsafe in porphyria.

Continuous Intravenous Infusion

Method of administration
Dilute 750micrograms of clonidine (5 ampoules of 150micrograms/mL) to 50mL with sodium chloride 0.9% to produce a solution of 750micrograms/50mL (15micrograms/mL).

Can be administered peripherally or centrally.

Dose
An initial dose of 75 micrograms (5mL of the 150microgram/mL solution) may be given by slow intravenous injection over 10 minutes followed by a continuous infusion of 0.5 – 2 microgram/kg/hour.

The dose should be titrated up quickly, as the patient’s blood pressure and heart rate allows.

Higher doses may occasionally be needed in some patients, up to a maximum 4microgram/kg/hr. This must be discussed with the consultant intensivist.

When clonidine is no longer required, gradually wean off the infusion by reducing the rate by 0.25 - 0.5 mcg/kg/hr every hour to minimise rebound hypertension and agitation. A slower rate of dose reduction may be required in some patients.

Example calculation

**Infusion rate**: The infusion rate can be calculated from the following equation:

\[
\text{Clonidine infusion rate (mL/hour) = } \frac{\text{Dose (micrograms/kg/hour) } \times \text{ Patient weight (kg)}}{\text{Concentration (micrograms/mL)}}
\]

**For example**: To administer a dose of 2 micrograms/kg/hour of clonidine to a 70kg patient using a standard solution of 750microgram in 50mL (= 15 microgram/mL), the calculation would be as follows:

\[
\text{Clonidine infusion rate } = \frac{2(\text{micrograms/kg/hour}) \times 70(\text{kg})}{15(\text{micrograms/mL})} = 9.33\text{mL/hour}
\]
Using a 750 microgram in 50 mL (15 micrograms/mL) clonidine solution the following specifies the infusion rate (mL per hour) required for different patient weights:

<table>
<thead>
<tr>
<th>Patient weight (kg)</th>
<th>Dose: 0.5 mcg/kg/hr</th>
<th>Dose: 1 mcg/kg/hr</th>
<th>Dose: 2 mcg/kg/hr</th>
<th>Dose: 4 mcg/kg/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 kg</td>
<td>1.3 mL/hr</td>
<td>2.7 mL/hr</td>
<td>5.3 mL/hr</td>
<td>10.7 mL/hr</td>
</tr>
<tr>
<td>60 kg</td>
<td>2 mL/hr</td>
<td>4 mL/hr</td>
<td>8 mL/hr</td>
<td>16 mL/hr</td>
</tr>
<tr>
<td>80 kg</td>
<td>2.7 mL/hr</td>
<td>5.3 mL/hr</td>
<td>10.7 mL/hr</td>
<td>21.3 mL/hr</td>
</tr>
<tr>
<td>100 kg</td>
<td>3.3 mL/hr</td>
<td>6.7 mL/hr</td>
<td>13.3 mL/hr</td>
<td>26.7 mL/hr</td>
</tr>
<tr>
<td>120 kg</td>
<td>4 mL/hr</td>
<td>8 mL/hr</td>
<td>16 mL/hr</td>
<td>32 mL/hr</td>
</tr>
<tr>
<td>140 kg</td>
<td>4.7 mL/hr</td>
<td>9.3 mL/hr</td>
<td>18.7 mL/hr</td>
<td>37.3 mL/hr</td>
</tr>
</tbody>
</table>

**Infusion rates (mL/hr) have been rounded down for ease of administration.

** Intravenous Bolus

**Method of administration**

Appropriate in acute agitation in a hypertensive, tachycardia patient. Dilute dose to 10 mL with sodium chloride 0.9% to facilitate slow administration and give by slow IV injection over 10-15 minutes to avoid a possible transient hypertensive effect.

Ideally administer centrally due to low pH. Alternatively if giving peripherally, it is less likely to cause damage on extravasation when diluted in sodium chloride.

50 micrograms tds may be titrated to a maximum of 250 micrograms tds.

Dose must not be withdrawn suddenly. Wean off gradually to minimise rebound hypertension and agitation.

**Enteral Route / Via Enteral Feeding Tube**

**Method of administration**

First choice is 150 microgram/mL injection can be given enterally as this is easier to administer NG. If unavailable disperse 100 microgram tablets in 10 mL water.

25 microgram tablets are film coated and do not readily disperse. Avoid if possible.

A prolonged break in feeding is not required.

**Dose**

Usual starting dose of 50 micrograms tds may be titrated gradually to a maximum 400 micrograms tds.

If converting from the intravenous route the doses are equivalent. Divide the current total daily dose and 3 doses and administer enterally.

Dose must not be withdrawn suddenly. Wean off gradually to minimise rebound hypertension and agitation.

**References**

1. Intensive Care Society. Medication Concentrations in Critical Care Areas 2010
5. Pharmaceutical Press. BNF online accessed on 18/06/2016.

The use of this guideline is subject to professional judgement and accountability. This guideline has been prepared carefully and in good faith for use within the Department of Critical Care at Brighton and Sussex University Hospitals. 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.

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