Guidelines on the use of Octreotide for Treatment of Postoperative Chylothorax in Paediatric Cardiothoracic Patients – 2019 Update

Indications
Octreotide to be used for treatment of a chylothorax after cardiothoracic surgery. It should be used in conjunction with nutritional modifications i.e. MCT (medium-chain triglyceride) diet or with TPN.

Note: This is for short term treatment only. Treatment should not be continued for more than 4 weeks.

Cautions (1-3)
- Hepatic impairment
- Diabetes
- Gut Ischaemia (due to reduced blood flow to gut)

Side-effects (1-3)
Octreotide is general well tolerated, however there are some serious adverse reactions:
- Anaphylaxis has been reported
- Gastro-intestinal disturbances (nausea, vomiting, abdominal pain, bloating diarrhoea and constipation)
- Hepatobiliary disturbances (hyperglycaemia, pancreatitis, raised alanine transaminase, hepatitis and jaundice)
- Cardiovascular disturbances (bradycardia)
- Thyroid disturbances (hypothyroidism, altered thyroid function tests)
- Pain and irritation at injection site

Mode of action (4-7)
Octreotide is a long acting synthetic analogue of somatostatin. Octreotide acts directly on vascular somatostatin receptors to reduce lymph fluid excretion. Somatostatin has been shown to reduce splanchnic, hepatic and portal blood flow and to inhibit intestinal motility. This reduces lymph flow and subsequent chyle formation.

Octreotide is well described in the literature, although the quality of data is fairly limited, comprising of mainly case report, case series and systematic reviews. A systemic review revealed marked variations of the treatment regimens, with the octreotide given either subcutaneously or as a continuous intravenous infusion. However, either route of administration showed octreotide to be a useful additional therapy in the management of postoperative chylothorax. Octreotide is not licensed for children less than 18 years old and for postoperative chylothorax.
Dosing Regime and Administration

Note: If the child is still having large losses through their drains even though they are on the optimum subcutaneous regime, then consider changing administration and dosage to the intravenous infusion.

Subcutaneous (1-9) (use the 200microgram/mL multidose vial)
Starting dose: 5microgram/kg/dose 12hourly (maximum dose is 200microgram tds)
After 24hours if drainage has not stopped increase dose to;
10microgram/kg/dose 12hourly (maximum dose is 200microgram tds)
After 24hours if drainage has not stopped increase dose to;
20microgram/kg/dose 12hourly (maximum dose is 200microgram tds)

- For subcutaneous administration use the 1mg in 5mL (200microgram/mL) multidose vial; it is recommended to puncture the cap of the vial a maximum of 10 times
- Allow the injection to reach room temperature before commencing administration
- Administer between meals or at bedtime. Do not give around meal times.
- Consider TDS dosing if unresponsive due to short half life (see pharmacokinetics).
- In exceptional circumstances, 20micrograms/kg/dose every 8 hours may be used (8). This should be at the direction of a Consultant.

Intravenous infusion (1, 3-7, 9) (use the 100microgram/mL vial)
1 to 4 microgram/kg/hour (In a small number of cases doses up to 10microgram/kg/hour have been used)

For children weighing less than 10kg: 300microgram in 24mL sodium chloride 0.9%
Draw up 3mL of 100microgram/mL octreotide and add to 21mL of sodium chloride 0.9%
For children weighing equal to or greater than 10kg: 500 microgram in 40mL sodium chloride 0.9%
Draw up 5mL of 100microgram/mL octreotide and add to 35mL of sodium chloride 0.9%

- 0.08mL/kg/hr of this preparation gives a dose of 1microgram/kg/hour
- Once it is prepared it stable at room temperature for 24 hours.
- Octreotide is compatible with parenteral nutrition
- If an alternative concentration is required please contact pharmacy for advice

Stopping Octreotide Treatment
Wean the octreotide down over 2 to 3 days to stop. Do this by halving the dose each day, until down to 10microgram/kg/dose subcutaneously or 0.5microgram/kg/hour intravenously and then stop.
Parameters to Monitor (1-3)
- Daily blood sugar test to monitor for hypoglycaemia or hyperglycaemia
- Monitor for sign of anaphylaxis after 1st and 2nd dose subcutaneously or during continuous infusion. This is very rare.
- Monitor LFT’s twice a week.
- Monitor for symptoms of arrhythmias, bradycardia and tachycardia.

Pharmacokinetics (1-3)
- Octreotide is rapidly absorbed after both subcutaneous and intravenous injection, with peak plasma levels occurring after 30 to 60 minutes and 4 minutes respectively.
- Plasma protein binding 65%.
- There is evidence of extensive hepatic metabolism. 32% is excreted as unchanged drug in the urine and 2% as unchanged drug in the faeces.
- The elimination half-life after subcutaneous administration is 100 minutes. After intravenous injection the elimination is biphasic with half-lives of 10 and 90 minutes.
- No dose adjustment is required in renal failure.

References