Leeds Teaching Hospitals

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

Indications
Octreotide to be used for treatment of a chylo thorax 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 \(^{(1,2)}\)
- Hepatic impairment
- Diabetes

Side-effects \(^{(1,2)}\)
- Gastro-intestinal disturbances (nausea, vomiting, abdominal pain, bloating, diarrhoea and constipation)
- Both hyperglycaemia and hypoglycaemia has been reported
- Pain and irritation at injection site
- Rarely pancreatitis has been reported
- Rarely arrhythmias have been reported

Mode of action \(^{(3,4)}\)
Octreotide is a long acting synthetic analogue of somatostatin. It has been shown that that somatostatin at a near physiologic dose reduces canine thoracic duct lymph flow rate. Octreotide may act directly on vascular somatostatin receptors to reduce lymph fluid excretion. Lymph flow in the thoracic duct depends on, among other factors, the state of splanchnic circulation and gastrointestinal motility. Somatostatin has been shown to reduce splanchnic, hepatic and portal blood flow and to inhibit intestinal motility. Indirect effects on the haemodynamics of splanchnic circulation and intestinal motility may have a role in reducing lymph flow. Apart from reducing chyle output, octreotide reduces the ratio of triglyceride concentrations in the lymph to that in the serum thereby reducing their contents in the pleural fluid.

There are currently no large randomised controlled trials (RCT) assessing the use of octreotide for postoperative chylothorax in paediatric patients although a number of case reports \(^{(3,5)}\) and single centre experiences have been published \(^{(4,6,7)}\). A recent systemic review revealed marked variations of the treatment regimens, with the octreotide given either subcutaneously or as a continuous intravenous infusion \(^{(9)}\). 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 \(^{(1,2)}\).
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, 2, 3, 6, 8, 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.

Intravenous infusion (1, 2, 4, 5, 8, 9, 10) (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 only 8 hours.
- If an alternative concentration is required please contact pharmacy for advice
- Octreotide is incompatible with glucose 5%

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\(^{(1,2)}\)
- 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\(^{(2,10)}\)
- 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
1. BNF for Children Online Accessed March 2016
2. emc.medicines.org.uk, Novartis Pharmaceuticals UK Ltd, Sandostatin
10. RCPCH. Medicines for Children. 2003