Carcinoid syndrome is characterized by cutaneous flushing, gut hypermobility with diarrhoea and bronchospasm. Refractory carcinoid syndrome occurs when symptoms are no longer controlled by standard doses of somatostatin analogues (SSAs) (Octreotide LAR 30mg i.m. or Lanreotide autogel 120mg s.c. every 28 days).

**Control of symptoms**

Evaluate for tachyphylaxis and absorption issues such as fibrosis at injection site

**Tumour control**

Yes

High tumour burden in liver

No

**Dose escalation of SSA**
- Increase frequency of long acting SSA to every 3 weeks or 2 weeks (1,2)
- Continuous subcutaneous infusion of octreotide
- Short acting octreotide s.c. can be used in addition for intermittently increased symptoms
- Could consider antihistamines (cyproheptadine or chlorphenamine) +/- oral steroids (i.v. if carcinoid crisis)

**Liver-directed therapies and tumour debulking to reduce the volume of tumour producing hormones** (9,10)
- Embolisation, resection, RFA, Liver transplantation (in very selected cases, see UKINETS bitesize guidance)*# following MDT discussion
- *Patients with carcinoid syndrome are at risk for developing carcinoid crisis during surgery or other types of intervention (See perioperative management of patients with neuroendocrine tumours, UKINETS bitesize guidance).
- #Carcinoid heart disease must be managed prior to surgery

**Dose escalation of SSA**

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**Telotristat ethyl 250mg t.i.d.** An oral tryptophan hydroxylase inhibitor. Approved for treatment of diarrhoea associated with CS in combination with SSA in patients insufficiently controlled by SSA. Not for routine commissioning in the NHS (7,8) depending on local access

**SSA should be continued throughout treatment lines**

**Peptide receptor radionuclide therapy (3)**

**Everolimus and SSA (off label) (4)**

- Interferon alpha (3-5 million IU sc three times weekly) in combination with SSA
- Associated with significant toxicity (5)

**Pasireotide LAR may be considered off label in very select patients when other treatments fail or are not feasible (6)**


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