The antidiarrheal efficacy of a proprietary amino acid mixture (enterade) in neuroendocrine tumor (NET) patients

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AMINO ACID ORAL REHYDRATION SOLUTION

Enterade is an amino acid-based, glucose-free medical food/beverage with electrolytes. It comprises amino acids (Valine, Aspartic Acid, Serine, Threonine, Tyrosine) selected to rebuild villi, protect the GI tract and promote hydration. It has been shown in studies with mice to mitigate radiation-induced acute gastrointestinal syndrome related to reduced electrolyte and nutrient absorption .

INTRODUCTION

- Based on SEER database, **gastroenteropancreatic neuroendocrine tumor (GEPNET) incidence has increased 6-fold** over past 3 decades.
- North American Neuroendocrine Tumor Society estimates that over 150,000 GEPNET patients are currently living in the United States.
- Diarrhea is a common symptom seen in GEPNET patients, usually caused by: excessive serotonin production, secondary to post-operative short gut syndrome, steatorrhea from somatostatin analogs, bile acid colitis or intestinal bacterial overgrowth.
- We conducted a retrospective study to evaluate antidiarrheal efficacy of enterade in neuroendocrine tumor patients with quality of life limiting diarrhea.**

METHODS

- Medical records of all the GEPNET patients treated with Enterade for symptomatic diarrhea were evaluated.
- Patients were treated at Markey Cancer Center between May 2017-January 2018.
- Enterade is classified as a medical food and is available over the counter.

DEMOGRAPHICS/RESULTS

- A total of **35 patients** were treated with enterade.
- Enterade was administered as an 8oz bottle BID for 1 week.
- Antidiarrheal efficacy data was available on 23 patients.
- 7 patients had small bowel neuroendocrine tumors (NET), 5 had bronchial NETs, 2 had colorectal NETs, 3 had NETs of unknown primary, 3 had gastric NETS, 2 had pancreatic NETs and one was high grade neuroendocrine carcinoma of prostate.
- 14 patients had history of prior bowel resection either for primary neuroendocrine tumor resection or debulking.
- 15 patients were on somatostatin analogs at the time of initiation of enterade.
- 17 out of 23 (73.9%) patients reported subjective improvement in diarrheal symptoms (Table 1).**
- 12 out of these 17 responders reported at least 50 percent reduction in diarrhea frequency.

Patient	Dx	SSA	Baseline BM	Post RX BM	Concurrent treatment at present
1	NET-Unknown Primary	Yes	9	4	Lanreotide; SSA Rescue
2	PNET-G1	No	6	4	No
3	Mid Gut-G1	Yes	9	6	Sandostatin
4	Gastric NET-G1	No	7	2	No
5	Gastrinoma-G1	Yes	10	10	Sandostatin/Octreotide
6	Lung- Typical Carcinoid	Yes	8	4	Sandostatin/Octreotide
7	Bronchial NET- Typical Carcinoid	Yes	7	3	Sandostatin/Octreotide
8	Midgut NET- G1	Yes	5	3	Sandostatin/Xermelo
9	NET unknown primary-G1	Yes	6	6	Sandostatin
10	PNET, VIPoma- G1	Yes	7	3	Sandostatin
11	Lung-Atypical carcinoid	Yes	5	0	Sandostatin
12	G-3 Prostatic NEC	No	3	0	Carbo/Irino, Pembrolizumab
13	Midgut- G1	Yes	6-8	6-8	Sandostatin
14	Colon NET-G1	Yes	7-9	7	Sandostatin, Xermelo
15	Midgut NET-G1	No	4	2	
16	Midgut NET-G1	Yes	6	10	Sandostatin/Octreotide
17	Midgut NET-G1	Yes	3	2	Sandostatin, Everolimus
18	Lung-LCNEC	No	20	0	Capecitabine/Temozolomide
19	Midgut NET G1	Yes	3	1	Lanreotide
20	MiNEN-Colon	No	12	4	Capecitabine
21	Unknown primary, VIPoma-G2	Yes	7	7	Sandostatin, capecitabine, temozolomide
22	Gastric NET-G2	No	10	4	Not started SSA yet
23	Lung G-2 NET	No	4	4	Pembrolizumab

Table 1. Stool frequency pre and post treatment with enterade; diagnoses and concurrent treatment included. Data for 23 responders to enterade as of January 2018.

CONCLUSIONS

73.9% (17/23) neuroendocrine tumor patients reported improvement in diarrhea with enterade.
52.2% (12/23) reported more than 50% reduction in diarrhea frequency.
A prospective Phase II study of enterade in gastroenteropancreatic neuroendocrine tumor patients with quality of life limiting diarrhea is planned.