

## **A case of $^{177}\text{Lu}$ -DOTATATE (LUTATHERA) therapy without the use of antiemetics**

Justin G. Peacock, MD, PhD (1,2)

Brendan O'Sullivan (3)

Michael R. Povlow, MD (1)

1 – Department of Radiology, Brooke Army Medical Center, San Antonio, TX

2 – Department of Radiology, Uniformed Services University of the Health Sciences, Bethesda, MD

3 – Chicago College of Osteopathic Medicine, Midwestern University, Downers Grove, IL

Corresponding author:

Justin G. Peacock, MD, PhD

Brooke Army Medical Center

3551 Roger Brooke Dr.

San Antonio, TX 78234

(210) 916-3290

[justin.g.peacock@gmail.com](mailto:justin.g.peacock@gmail.com)

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Department of the Army, the Department of the Air Force, Department of Defense, the Defense Health Agency, or the US Government.

Case reports, such as this one, are not considered research and therefore do not require institutional IRB approval.

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## **Abstract**

Recommended  $^{177}\text{Lu}$ -DOTATATE (LUTATHERA) treatment regimens involve prophylaxis with antiemetics to counteract the emetogenic properties of the nephroprotective amino acid solution infusion. We describe a 58-year-old female treated with LUTATHERA for metastatic small bowel carcinoid, who was allergic to many classes of antiemetics. Therefore, she was treated with LUTATHERA without antiemetic prophylaxis. She tolerated the compounded amino acid infusion of lysine/arginine, followed by LUTATHERA, without significant nausea or any vomiting. We hypothesize that aggressive antiemetic prophylaxis may not be necessary if a LUTATHERA patient receives compounded lysine/arginine amino acid solutions. The omission would decrease overall healthcare costs and limit possible medication side effects.

## **Keywords**

LUTATHERA, antiemetics, amino acid, nausea, vomiting

## **Abbreviations**

Amino Acids (AA)

## **Introduction**

<sup>177</sup>Lu-DOTATATE (LUTATHERA) is a peptide receptor radionuclide therapy used in the treatment of gastroenteropancreatic neuroendocrine tumors. The treatment regimen includes pretreatment with positively-charged amino acids (AA) to prevent possible nephrotoxicity from LUTATHERA retention. Nausea and vomiting are unfortunate side effects of the AA solution (1). Historically, commercial AA solutions resulted in significant nausea; however, new data suggests that compounded L-arginine and L-lysine AA solutions are significantly less emetogenic (2). Due to historic severe nausea and vomiting with commercial AA solutions, aggressive pretreatment with anti-emetics is recommended (3). We present a case of a patient allergic to many antiemetic drugs, who successfully underwent LUTATHERA therapy without the use of antiemetics.

## **Case Report**

The typical prophylactic antiemetic at our institution for LUTATHERA patients is the combination drug Neupitant/Palonosetron (Akynzeo). We administer Akynzeo 30 minutes prior to the AA infusion, followed by LUTATHERA infusion 30 minutes later. For the AA renal-protective solution, we use a compounded lysine/arginine solution, rather than the commercial AA solutions.

A 58-year-old female presented to our clinic for her first LUTATHERA cycle with progressive metastatic small bowel carcinoid despite chronic long-acting octreotide therapy (Figure 1). She had a resection of a low grade ileal carcinoid tumor in 2005, followed by long-acting octreotide therapy. During consultation for the first treatment dose, the patient reported severe allergies to many classes of antiemetics, including the anti-serotonergic class that we typically give patients. After discussion with the patient regarding the risks of not administering antiemetics, we decided to proceed with standard AA and LUTATHERA (7.3 Gbq) infusion without antiemetic prophylaxis. LUTATHERA infusion was performed using the standard technique outlined by the manufacturer. The patient denied significant nausea or any vomiting throughout her infusion and at approximately 2 hour intervals throughout her overnight hospital admission. We imaged the patient the next morning per standard protocol and released her to home (Figure 2). She denied nausea the next morning as well.

## **Discussion**

Although our patient was at a higher risk for developing symptoms of nausea and vomiting due to antiemetic omission, the compounded lysine/arginine AA solution likely lowered the symptom likelihood (2). She was monitored closely but did not develop any significant nausea or vomiting symptoms throughout her clinical course.

The recommended LUTATHERA treatment regimen includes aggressive and potentially expensive antiemetic prophylaxis. The cash-paying cost of a single dose of the combination antiemetic Akynzeo is \$683. Another possible problem with these antiemetics are side effects, including headache and fatigue.

## Conclusion

In this study, we report a case of a patient with metastatic small bowel carcinoid undergoing successful Lutathera therapy without anti-emetics due to allergies. We hypothesize that aggressive and potentially expensive antiemetic prophylaxis may not be necessary when infusing patients with the compounded lysine/arginine AA solution. Further research into this matter is important to improve patient care and to reduce treatment costs.

## References

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## Figures

**Figure 1.**  $^{68}\text{Ga}$ -DOTATATE PET/CT MIP image demonstrating multiple radiotracer-avid abdominopelvic lymph nodes (arrows). Incidental mediastinal and hilar nodal uptake (dashed arrows) felt to be due to an underlying inflammatory condition, such as sarcoidosis. Scale bar represents 10 cm.



**Figure 2.** LUTATHERA (7.3 Gbq) post-treatment anterior planar gamma image demonstrating a similar pattern of uptake as the prior <sup>68</sup>Ga-DOTATATE PET/CT, with abdominopelvic (arrows) and incidental mediastinal and hilar (dashed arrows) nodal uptake again noted (**Figure 1**). Scale bar represents 10 cm.

