Comparing the Cost of Treatment with Octreotide Long-Acting Release versus Lanreotide in Patients with Metastatic Gastrointestinal Neuroendocrine Tumors

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BACKGROUND: The 2 somatostatin analogs currently recommended by the National Comprehensive Cancer Network for the treatment of gastrointestinal (GI) neuroendocrine tumors (NETs) include octreotide long-acting release (Sandostatin LAR) for injectable suspension and lanreotide (Somatuline Depot) injection for subcutaneous use.

OBJECTIVE: To estimate the costs to payers associated with 30-mg octreotide LAR and 120-mg lanreotide treatment among patients with metastatic GI-NETs.

METHODS: The costs to payers associated with the 2 drugs were estimated by including the costs of each drug, drug administration, and adverse events. The unit drug costs for octreotide LAR and for lanreotide were obtained from ReadyPrice Wholesale Acquisition Cost; the doses were obtained from published studies. The adverse event rates were obtained from 2 phase 3 clinical trials, PROMID and CLARINET. Deterministic one-way sensitivity analyses were used to assess the impact of modifying assumptions and inputs on the results, including the 2017 Average Sales Price (ASP). All costs were estimated in 2016 US dollars, with a constant discount of 3%.

RESULTS: The costs to payers associated with the treatment of GI-NETs during 1-, 3-, and 5-year horizons were $74,566, $180,082, and $262,344, respectively, for octreotide LAR and $84,856, $205,562, and $299,667, respectively, for lanreotide. Thus, octreotide LAR was associated with lower costs by $10,290 (1 year), $25,480 (3 years), and $37,323 (5 years) compared with lanreotide. Over a 5-year horizon, the costs of adverse events and administration accounted for 0.72% of the total cost for octreotide LAR and 0.51% of the total cost for lanreotide. Sensitivity analyses confirmed that the main factor affecting the cost difference was the price of the drugs; analyses using the ASP yielded similar results.

CONCLUSION: For the management of metastatic GI-NETs, the cost to payers of treatment with 30-mg octreotide LAR is considerably lower than with 120-mg lanreotide over 1-, 3-, and 5-year horizons. In the presence of healthcare resource constraints, these findings may support decision-making when considering the care of patients with metastatic GI-NETs.

KEY WORDS: adverse events, Average Sales Price, CLARINET, GI-NETs, lanreotide, octreotide LAR, PROMID, sensitivity analyses, treatment cost, Wholesale Acquisition Cost

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Comparing the Cost of Treatment of Metastatic GI-NETs

KEY POINTS

➤ The 2 somatostatin analogs octreotide long-acting release (Sandostatin LAR) and lanreotide (Somatuline Depot) are recommended for the treatment of GI-NETs.

➤ In this study, data from published studies are used to estimate the costs related to 30-mg octreotide LAR and 120-mg lanreotide in patients with metastatic GI-NETs.

➤ The costs of treatment with each drug included the drug cost, drug administration, and adverse events associated with each drug, and were examined over 1-, 3-, and 5-year horizons.

➤ Drug cost accounted for approximately 99% of the treatment cost for each agent.

➤ The per-patient cost of treatment was lower with octreotide LAR than with lanreotide by $10,290 (1 year), $25,480 (3 years), and $37,323 (5 years).

➤ Sensitivity analyses confirmed that treatment with octreotide LAR is less costly than with lanreotide, and that the key driver of the cost difference is drug pricing.

➤ These findings may help decision makers, including payers and providers, when considering the care of patients with metastatic GI-NETs.

100,000 in 2012,2,3 reflecting a trend of rising incidence.1,3,4 Approximately 61% of NETs occur in the gastrointestinal (GI) tract,5 comprising 1% to 2% of all GI malignancies.5 In 2004, the prevalence of GI-NETs in the United States was 103,213 cases.1

GI-NETs are categorized as functional (biologically and hormonally active) or nonfunctional tumors (inactive).7,8 Functioning tumors are rarer than nonfunctional tumors, and they secrete biogenic amines and peptide hormones, which may lead to carcinoid syndrome.9,10 The symptoms of carcinoid syndrome include flushing, diarrhea, abdominal pain, and right-sided valvular heart disease.7,11 The majority of GI-NETs are nonfunctional and indolent; as a result, patients may not present with clinical symptoms for several years.5

The diagnosis of GI-NETs often occurs at an average of 5 to 7 years after the onset of symptoms, but time the development of metastasis or significant local invasion may have occurred.5 Based on the published literature, 40% to 90% of tumors are metastatic at diagnosis.5,12,13

Metastatic GI-NETs present with a poor prognosis, and the potentially curative treatments, including radical dissection, radiation, and chemotherapy, are often not acceptable options.14 For metastatic or inoperable tumors, the National Comprehensive Cancer Network (NCCN) guidelines recommend somatostatin analogs for first-line therapy, specifically octreotide long-acting release (Sandostatin LAR) and lanreotide (Somatuline Depot), to control hormone-related symptoms in patients with functional GI-NETs.7,15,16 Somatostatin is a growth hormone release–inhibiting factor that suppresses physiologic functions of the GI tract, such as the secretion of pancreatic and intestinal hormones and GI motility.15 Somatostatin analogs are effective in inhibiting GI-NET growth and stabilizing tumor size, primarily by reducing the production of growth hormones and serotonin by the tumor.17,18 (Because several formulations of these 2 somatostatin analogs are available, this article uses “octreotide LAR” and “lanreotide” to avoid confusion.)

Octreotide LAR is indicated for the long-term management of symptoms associated with metastatic GI-NETs, with a recommended dose of 10, 20, or 30 mg every 4 weeks, which is administered intramuscularly.8,19 In patients with nonresectable metastatic NETs, dose escalation of octreotide LAR of more than 30 mg monthly (maximal dose, 60 mg monthly) may reduce the symptoms of diarrhea, flushing, and abdominal pain.20 In the placebo-controlled, double-blind, randomized phase 3 clinical trial PROMID, patients with metastatic midgut NETs who received 30-mg octreotide LAR monthly showed significantly slower rates of tumor progression and a higher prevalence of stable disease than patients who received placebo.17 However, overall survival (OS) was not statistically significant, and both treatment groups had comparable levels of global quality of life after 6 months of follow-up. The tumor control effect of octreotide LAR has been well-documented in studies performed in real-world clinical settings.7,11,22

Lanreotide is indicated for the treatment of patients with nonresectable, well- or moderately differentiated, locally advanced or metastatic gastroenteropancreatic NETs to improve progression-free survival (PFS). The recommended dose for lanreotide is 120 mg every 4 weeks, which is administered by subcutaneous injection.21 In the phase 3, placebo-controlled clinical trial CLARINET, patients with grade 1 or 2 sporadic NETs originating in the midgut who received 120-mg lanreotide monthly had significantly improved PFS, but not significantly improved OS, without compromised quality of life compared with patients receiving placebo.22 Another placebo-controlled trial, ELECT, demonstrated that 120-mg lanreotide monthly significantly delayed the use of rescue medication with short-acting octreotide LAR in patients with carcinoid syndromes.23 Because of the increasing incidence of NETs,2,3 the large percentage of NETs occurring in the GI system,5...
and the high cost of treatment, understanding the economic burden of the treatment of GI-NETs is important. Octreotide LAR and lanreotide are synthetic somatostatin analogs with similar mechanisms of action. Octreotide LAR has a long history of effectiveness and safety in the treatment of metastatic GI-NETs, and lanreotide has recently been approved for pancreatic NET in 2014 and for carcinoid syndrome in 2017.

The comparative costs of GI-NET treatment with these drugs to payers have not been previously assessed from a payer’s perspective. Therefore, the purpose of this study was to evaluate the costs to payers and the adverse events associated with octreotide LAR treatment compared with lanreotide treatment in patients with metastatic GI-NETs.

### Methods

We estimated the per-patient costs to payers of treatment and treatment-related adverse events for patients receiving 30-mg octreotide LAR or 120-mg lanreotide for the treatment of metastatic GI-NETs over 1-, 3-, and 5-year horizons. The starting age of patients receiving treatment was assumed to be 50 years, and patients were assumed to continue treatment until death. Based on clinical experts’ opinions and the NCCN guidelines, octreotide LAR and lanreotide were deemed to have similar effectiveness. Hence, only drug acquisition costs, drug administration costs (Table 1), and the costs of treatment-related adverse events (Table 2) were included in the calculation, because other costs (ie, for procedures and tests, physician visits, hospitalizations, end-of-life care, and additional medical treatments) were assumed to be identical. The costs included in the model were converted and/or inflated to 2016 US dollars per the Consumer Price Index, All Urban Consumers. The costs were calculated using an annual discount rate of 3%.

### Treatment Duration and Survival Assumptions

The treatment algorithm in this analysis was based on the NCCN’s guidelines for NETs. The patients in each treatment arm were assumed to have received the active agent (ie, octreotide LAR or lanreotide) until death, based on reported OS data. The median OS was considered to be the same between the 2 drugs, based on expert clinical opinion, and the NCCN’s guidelines treat these drugs as interchangeable, their mechanism of action is the same, and there are no clinical data to suggest a difference in OS. A literature review was undertaken, and an indirect treatment comparison was considered to quantify the differences in OS between the 2 treatments.

The primary clinical trials, PROMID and CLARINET, were identified as the most suitable data sources for the comparison. However, a detailed review of the trials’ data revealed substantial differences in study population and design that could not be resolved by making post-hoc adjustments. For example, only 85 patients were randomized to 30-mg octreotide LAR or placebo in the PROMID study, which focused on treatment-naïve patients with metastatic midgut carcinoid tumors. CLARINET included 204 patients with a wider variety of NETs and previous exposure to treatment who were randomized to receive placebo or 120-mg lanreotide every 4 weeks for 96 weeks or until disease progression or death. No other studies were identified to compare OS between the 2 drugs.

The OS for patients was assumed to be exponentially distributed, with a median of 94.49 months for both drugs, assessed as a weighted average of the medians for patients with functionally active and inactive tumors in

### Table 1 Costs of Octreotide LAR and Lanreotide and Their Administration

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Indicated dose</th>
<th>Indicated frequency</th>
<th>Administrations per cycle (28 days), N</th>
<th>Unit price (2016 US dollars), $</th>
<th>Cost of administration, $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Octreotide LAR</td>
<td>30 mg</td>
<td>Every cycle (28 days)</td>
<td>1</td>
<td>5241.73</td>
<td>25.42</td>
</tr>
<tr>
<td>Lanreotide</td>
<td>120 mg</td>
<td>Every cycle (28 days)</td>
<td>1</td>
<td>6000.00</td>
<td>25.42</td>
</tr>
</tbody>
</table>

*The costs of somatostatin analog treatments estimated per cycle were based on the ReadyPrice Wholesale Acquisition Cost, which was accessed July 11, 2016. LAR indicates long-acting release.

### Table 2 Rates and Cost of Adverse Events Associated with Octreotide LAR and Lanreotide

<table>
<thead>
<tr>
<th>Adverse event</th>
<th>Cost per episode, 2016 US $</th>
<th>Condition</th>
<th>Octreotide LAR rate, %</th>
<th>Lanreotide rate, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal pain</td>
<td>1997.73</td>
<td>Other GI</td>
<td>4.8</td>
<td>6</td>
</tr>
<tr>
<td>Cardiac failure</td>
<td>4094.64</td>
<td>Heart conditions</td>
<td>4.8</td>
<td>—</td>
</tr>
<tr>
<td>Cholelithiasis</td>
<td>7839.24</td>
<td>Gallbladder, pancreatic, and liver disease</td>
<td>2.4</td>
<td>1</td>
</tr>
<tr>
<td>Constipation</td>
<td>1997.73</td>
<td>Other GI</td>
<td>2.4</td>
<td>—</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>1997.73</td>
<td>Other GI</td>
<td>2.4</td>
<td>—</td>
</tr>
<tr>
<td>Hypertension</td>
<td>795.40</td>
<td>Hypertension</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>Insomnia</td>
<td>824.10</td>
<td>Other care and screening</td>
<td>2.4</td>
<td>—</td>
</tr>
<tr>
<td>Musculoskeletal pain</td>
<td>1979.28</td>
<td>Other bone and musculoskeletal disease</td>
<td>—</td>
<td>2</td>
</tr>
<tr>
<td>Pyrexia</td>
<td>484.83</td>
<td>Influenza</td>
<td>4.8</td>
<td>—</td>
</tr>
<tr>
<td>Vomiting</td>
<td>824.10</td>
<td>Other care and screening</td>
<td>—</td>
<td>2</td>
</tr>
</tbody>
</table>

*The cost per episode was taken from the Medical Expenditure Panel Survey. Adverse event rates are from the PROMID clinical study report and are grade 3 or higher, occurring more often than with placebo, and in >5% of patients. Adverse events are from the drug’s prescribing information, occurring more often than with placebo, and in >5% of patients.

GI indicates gastrointestinal; LAR, long-acting release.
the PROMID study,17 OS, in addition to the time horizon, determined the duration of treatment for patients.

Drug Costs
The estimated per-cycle (ie, 28 days) costs of a somatostatin analog treatment were $5241.73 for 30-mg octreotide LAR and $6000 for 120-mg lanreotide, based on the ReadyPrice Wholesale Acquisition Cost, which was accessed on July 17, 2016.31 A sensitivity analysis was performed using the Average Sales Price (ASP) from the Centers for Medicare & Medicaid Services (CMS),32 with a price of $5266.50 for 30-mg octreotide LAR and $6481.32 for 120-mg lanreotide. The administration of lanreotide and of octreotide LAR requires healthcare professional services. The cost of administration was derived from CMS’s Physician Fee Schedule33 for 1 doctor visit, and was $25.42 for octreotide LAR and for lanreotide (Current Procedural Terminology code 96372; Table 1).

Adverse Event Rates and Costs
The proportions of patients experiencing an adverse event while treated with octreotide LAR or with lanreotide came from the PROMID and CLARINET studies17,24; octreotide LAR–related events were obtained from PROMID,17 whereas lanreotide–related events came from the drug’s prescribing information.23 Grade ≥3 adverse events reported in PROMID were included for octreotide LAR, and severe adverse events listed in the prescribing information were included for lanreotide, because the listed definitions of these 2 categories were similar. This choice provided the most similar criteria for defining adverse event lists based on the available data in the published literature.23,34

Data on the use of grade ≥3 adverse events for octreotide LAR were used from the PROMID trial, such as the Common Terminology Criteria for Adverse Events, which defines grade 3 adverse events as “severe or medically significant but not immediately life-threatening,” and grade 4 adverse events as “life-threatening consequences” that require urgent intervention.14 The adverse events included for lanreotide came from the adverse event rates listed in the prescribing information for lanreotide; adverse events were defined as adverse events that are hazardous to well-being or resulting in significant impairment of function or incapacitation.23 The adverse events for the 2 drugs that were evaluated in our study were those that occurred more often than in the respective placebo arms, because this information was available from the PROMID and CLARINET trials. Our analysis assumed that for each patient, every adverse event occurred once at most.

The adverse event unit costs were derived from the Medical Expenditure Panel Survey (MEPS).15 The cost obtained from MEPS for each event was applied as a unit cost to the corresponding rate of occurrence of each adverse event for both treatment arms. The overall mean cost of adverse events per patient receiving treatment in each arm was calculated by aggregating the total costs for each event. The Healthcare Cost and Utilization Project provides the mean unit inpatient cost for serious adverse events in the United States, which was applied to the serious adverse event rate for both treatment arms and was included in the sensitivity analysis.16

Sensitivity Analysis
Deterministic one-way sensitivity analyses were conducted to assess the impact of modifying assumptions on overall costs. The variables in the sensitivity analysis included the costs of 30-mg octreotide LAR and 120-mg

| Table 3 Estimated Costs of Octreotide LAR and Lanreotide Over 3 Periods

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1-year</td>
<td>3-year</td>
<td>5-year</td>
</tr>
<tr>
<td>Treatment costs, $ (%)</td>
<td>73,949</td>
<td>179,464</td>
<td>261,726</td>
</tr>
<tr>
<td>Drug, $ (%)</td>
<td>73,992</td>
<td>179,598</td>
<td>263,460</td>
</tr>
<tr>
<td>Administration, $ (%)</td>
<td>357 (0.48)</td>
<td>866 (0.48)</td>
<td>1263 (0.48)</td>
</tr>
<tr>
<td>Adverse event costs, $ (%)</td>
<td>618 (0.03)</td>
<td>618 (0.34)</td>
<td>618 (0.03)</td>
</tr>
<tr>
<td>Total costs associated with treatment, $</td>
<td>74,566</td>
<td>180,082</td>
<td>262,344</td>
</tr>
</tbody>
</table>

Notes:

1 Costs of drug acquisition, drug administration, and treatment-related adverse events; costs were converted and/or inflated to 2016 US dollars per the Consumer Price Index, All Urban Consumers,30 with an annual discount rate of 3%.
2 WAC from ReadyPrice; accessed July 11, 2016.31
3 Centers for Medicare & Medicaid Services Physician Fee Schedule33 ($25.42/visit for octreotide LAR and for lanreotide).
4 Adverse event costs were calculated using the Medical Expenditure Panel Survey.35
5 The sum from this column is rounded.

LAR indicates long-acting release; WAC, Wholesale Acquisition Cost.
lanreotide, the annual discount rate, the type of adverse event, and the rate of adverse events (assuming the same adverse events for both drugs based on rates from the PROMID trial). The analysis was programmed using Excel 2010 (Microsoft; Redwood, WA), and no statistical comparisons were performed in this study.

**Results**

Compared with 120-mg lanreotide, 30-mg octreotide LAR was associated with lower costs of treatment by $10,290 in a 1-year period (Table 3). Specifically, the 1-year direct cost related to octreotide LAR treatment was $74,566. Of that, $73,592 (98.69%) was for drug costs, $357 (0.48%) was for administration costs, and $618 (0.83%) was for adverse event–related costs. The total cost to payers related to lanreotide was $84,856, which comprised $84,238 (99.27%) of drug costs, $357 (0.42%) of administration costs, and $262 (0.31%) of adverse event–related costs.

Similarly, 30-mg octreotide LAR was also associated with lower costs of treatment by $25,480 in a 3-year period compared with 120-mg lanreotide (Table 3). Specifically, the 3-year cost related to octreotide LAR treatment was $205,562, which comprised $204,434 (99.45%) related to drug costs, $866 (0.42%) to administration costs, and $262 (0.13%) to adverse event–related costs.

Consistent with the trend observed in 1-year and 3-year costs, the estimated 5-year cost of treatment with octreotide LAR was $37,323 lower than the estimated treatment costs of lanreotide (Table 3). Specifically, the 5-year cost related to octreotide LAR treatment was estimated to be $262,344. Of that, $260,463 (99.28%) was linked to drug costs, $1263 (0.48%) to administration costs, and $618 (0.24%) to adverse event–related costs. The 5-year cost associated with lanreotide treatment was $299,667, which comprised $298,142 (99.49%) of drug costs, $1263 (0.42%) of administration costs, and $262 (0.09%) of adverse event–related costs.

The conclusions in the core analyses were found to hold in deterministic one-way sensitivity analyses, in which the annual discount rate, method of estimating adverse event–related costs, and drug price were varied. Because the annual discount rate varied from 1% to 5% over a 5-year horizon, the cost difference (the cost of octreotide LAR minus the cost of lanreotide) ranged from –$39,044 to –$35,737. Using only serious adverse events to estimate the adverse event–related cost led to a cost difference of –$38,073, whereas assuming that both trials had the same adverse event–related costs (based on PROMID trial data) led to a cost difference of –$37,679. The full results of the sensitivity analysis for each time horizon can be found in Table 4 and in the Figure.

Across the 3 time horizons, the cost difference was most sensitive to the cost of the 2 drugs. Because the cost of octreotide LAR varied from 75% to 125% of its actual value, the cost differences between the drugs ranged from –$102,438 to $27,793 over a 5-year horizon. Using the
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ASP instead of the Wholesale Acquisition Cost (WAC) led to a cost difference of $48,289. The corresponding range as the cost of lanreotide was varied was $37,213 to $111,858 using the WAC (Table 4).

Discussion

Compared with octreotide LAR, treatment with lanreotide was estimated to incur higher costs by $10,290, $25,480, and $37,323 over 1-, 3-, and 5-year horizons, respectively. These results show that for patients with metastatic GI-NETs, the cost of treatment with octreotide LAR is substantially lower than with lanreotide, with the difference predominantly driven by the cost of the drugs. The costs of administration and treatment-related adverse events were similar between the groups, and comprised <1% of the total costs in all time horizons.

To date, no studies have performed detailed comparative economic evaluations of octreotide LAR and lanreotide in patients with metastatic GI-NETs. One recent study compared the annual drug costs of octreotide LAR and lanreotide, although it did not account for death rates, administration costs, and adverse event–related
costs. That study concluded that compared with 30-mg octreotide LAR, 120-mg lanreotide was more costly by approximately $12,500 (2016 US dollars) annually based on a monthly cost difference of $1045, which is similar to the findings of our analysis.

In addition, some studies have evaluated the cost-effectiveness of the 2 drugs in patients with acromegaly. Acromegaly is a hormonal disorder that results from the hypersecretion of growth hormones, which is primarily caused by pituitary tumors, but can also be caused by NETs. These studies have shown that octreotide LAR is a more cost-effective treatment for acromegaly than lanreotide.

In terms of efficacy, no studies have directly compared octreotide LAR with lanreotide for the treatment of metastatic GI-NETs. A literature review identified the 2 randomized controlled trials of these treatments—PROMID and CLARINET—that reported information on survival and adverse events for GI-NETs. Although indirect comparisons are often used to compare treatments when head-to-head clinical trial comparisons are unavailable, these pivotal studies exhibit important and significant differences in their sample populations. Some key differences were: the median PFS in the placebo group in CLARINET was 18 months versus 6 months in PROMID; CLARINET included nonfunctional NETs only, whereas PROMID included functional and nonfunctional NETs; and CLARINET included midgut, hindgut, and pancreatic NETs, whereas PROMID only included midgut NETs.

Subgroup analyses and adjustments for population differences did not mitigate the difference in PFS in the placebo arms. Hence, an indirect comparison was considered infeasible for this study. In addition, the NCCN’s guidelines do not differentiate between the 2 drug formulations. For these reasons, our study focused on costs with the assumption of equivalent efficacy.

The robustness of our results was tested in sensitivity analyses, in which the estimated total cost differences comparing treatment with octreotide LAR to lanreotide ranged from $31,349 to $10,770, $76,589 to $25,628, and $111,858 to $37,213 over 1-, 3-, and 5-year horizons, respectively (Table 4). Only under the hypothetical scenarios that the price of octreotide LAR increases (ie, 125% of current price) or that the price of lanreotide decreases (ie, 75% of current price) would the total costs of lanreotide be lower than for octreotide LAR; under all remaining scenarios, octreotide LAR was considerably less costly.

Limitations

This study has several limitations as a result of the assumptions used regarding disease, treatment patterns, and costs. First, although sensitivity analyses are designed to account for uncertainties, the one-way sensitivity analyses may not reflect all aspects of the relationships of these factors.

Second is the lack of a head-to-head efficacy comparison of octreotide LAR versus lanreotide in the literature. The PROMID and CLARINET trials are known to have considerably different populations. Thus, OS data for octreotide LAR were obtained from the PROMID study and were assumed to be the same for lanreotide, because of similarities in their mechanisms of action and their interchangeability in the NCCN’s guidelines. Given the lack of comparative data, the use of efficacy data based on this assumption may not reflect the true relative effectiveness of these drugs.

Third, OS data used in this analysis were derived from 1 clinical trial, PROMID, that has a relatively small patient sample size (ie, 85 patients with metastatic midgut NETs). Therefore, the results of this analysis cannot necessarily be generalized to other patient populations with metastatic GI-NETs.

Fourth, based on descriptions in the source documents, the analysis assumed that the definitions of grade 3 adverse events in PROMID and severe adverse events in CLARINET were similar; however, although the definitions are similar, the adverse events captured by these definitions may not be identical and any differences may affect the calculation of adverse event–related costs. In addition, the known population differences between the 2 trials may affect the comparability of the adverse events in the studies. However, because adverse event–related costs were a small contributor to the overall costs compared with the drug costs, this is not expected to impact the overall conclusions. In addition, the robustness of the results to the assumptions regarding the adverse event rates was tested in sensitivity analyses (one analysis in which serious adverse events were compared and another in which the drugs were assumed to have the same adverse events, based on those reported in the PROMID trial), and the overall conclusion was unchanged.

Finally, the possible costs related to unsuccessful injections were not included in this analysis, but may influence the overall costs related to these medications. Through a review of published literature, it is not clear what the differences in clinical outcomes may be between successful and unsuccessful intramuscular injections, and it is unknown whether a mildly unsuccessful injection may still yield acceptable clinical benefit. These uncertainties make it impossible to determine the extent of the impact, if any, that unsuccessful injections may have on the total costs of either octreotide LAR or lanreotide.
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Conclusions

The findings of this analysis are robust and provide valuable information to all relevant stakeholders, including patients, physicians, and payers, regarding the use of lanreotide and octreotide LAR, which are clinically comparable agents in the treatment of GI-NETs. Specifically, our findings suggest that in patients with metastatic GI-NETs, the per-patient cost of treatment with octreotide LAR is considerably lower over 1-, 3-, and 5-year horizons by $10,290, $25,480, and $37,323, respectively, compared with treatment with lanreotide. In the presence of healthcare resource constraints, these findings may help the decision-making when considering the care of patients with metastatic GI-NETs.

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Author Disclosure Statement

Dr Ayyagari, Mr Li, Ms Rokito, Dr Yang, and Dr Xie are employees of Analysis Group, Inc, which received funding from Novartis for this study. Dr Neary is an employee of Novartis. Dr Benson is a consultant to several pharmaceutical companies (see list at www.AHDBonline.com).

References


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