

Assessment of Patient Satisfaction with a Formulary Switch from Omeprazole to Lansoprazole in Gastroesophageal Reflux Disease Maintenance Therapy

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Abstract

Objective: To determine if patients perceived a difference in the efficacy, side effects, and value of omeprazole versus lansoprazole for gastroesophageal reflux disease (GERD) maintenance therapy after a formulary conversion, and to evaluate the costs of the conversion.

Study Design: An unblinded questionnaire was mailed to patients who were currently receiving GERD maintenance therapy with lansoprazole from the Veterans Affairs San Diego Healthcare System.

Patients and Methods: Three hundred patients who had been on omeprazole for a minimum of 2 months prior to the formulary conversion and on lansoprazole for a minimum of 2 months after the formulary conversion were surveyed. Patients were asked to rate the severity and frequency of their symptoms (pain, heartburn, and regurgitation) on a scale from 0 to 9 for each medication. Questions regarding side effects, medication preference, and satisfaction with the formulary conversion process were also addressed.

Results: Fifty-two percent of the surveys were returned. There was no statistically significant difference between median total symptom scores for omeprazole and lansoprazole (1.33 vs. 1.34, respec-

tively). More patients reported side effects to lansoprazole ($P < 0.001$) than to omeprazole. Sixty-four percent of patients preferred omeprazole ($P < 0.005$). The formulary conversion was estimated to save \$29,000 per year.

Conclusions: Omeprazole was the medication preferred by patients for GERD maintenance therapy. Patients were willing to pay an additional fee for their preferred agent. Fewer adverse events were reported with omeprazole. The potential cost savings of the formulary conversion may have been at the expense of patient satisfaction.

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Gastroesophageal reflux disease (GERD) is a disorder in which the lower esophageal sphincter is either inappropriately relaxed or is at a reduced resting pressure. Reduced sphincter tone can result in gastric contents being refluxed into the esophagus, causing esophagitis and possibly leading to more serious sequelae such as esophageal ulcers, esophageal strictures, and Barrett's esophagus.¹⁻³ A common disorder, every day approximately 7% to 10% of US adults experience GERD symptoms, such as heartburn, epigastric pain, and regurgitation.^{1,2} When endoscopic evidence of esophageal mucosa damage is used to define the presence of GERD, the estimated prevalence is approximately 2%.¹ Patients often require chronic maintenance therapy.

The goals of GERD maintenance therapy include relieving symptoms, facilitating repair of the

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esophageal mucosa, and preventing complications. Initial therapeutic regimens involve lifestyle changes, such as limiting alcohol consumption, refraining from eating before bedtime, eating smaller meals, losing weight, and elevating the head of the bed, all of which are aimed at reducing the reflux of gastric contents.⁴ Despite these measures, for most patients GERD is a chronic, relapsing condition that requires medication that can suppress gastric acid production or stimulate the motility of the digestive tract. Medications typically used for GERD maintenance therapy include H₂-receptor antagonists, prokinetic agents such as cisapride and metoclopramide, and proton pump inhibitors (PPIs).⁴ Proton pump inhibitors have been demonstrated to be more effective than other agents for acute and chronic GERD therapy.⁵⁻¹¹

In many healthcare institutions, PPIs account for a large percentage of the drug budget. To reduce drug expenditures, several organizations have restricted the PPIs available on formulary based on the lowest acquisition cost. In February 1997, the Veterans Affairs Healthcare System signed a contract in which lansoprazole was selected to replace omeprazole as the PPI available on the national formulary. Because there were no head-to-head trials comparing the side effects and symptom control of these 2 agents in GERD maintenance therapy, the decision to make a formulary switch was based on data that demonstrated that omeprazole and lansoprazole had similar effects on gastric acid production and comparable efficacy in the treatment of ulcers and healing rates of erosive esophagitis.^{12,13}

Many different medications and dosages have been compared to each other for GERD maintenance therapy. In 1995, Vigneri et al compared omeprazole to nonproton pump inhibitors and concluded that omeprazole, either alone or in combination with cisapride, was more effective than the other regimens.¹⁴ Mee et al compared omeprazole 20 mg to lansoprazole 30 mg and noted that these doses were equivalent when comparing healing rates in patients with erosive esophagitis.¹³ Only 1 unpublished study to date has compared the control of chronic GERD symptoms between omeprazole and lansoprazole. Vivian and colleagues, in a randomized, blinded, cross-over design study performed at the VA San Diego Healthcare System (VASDHS), compared 15 mg and 30 mg of lansoprazole to 20 mg and 40 mg of omeprazole in patients with chronic GERD.¹⁵ The authors noted a trend toward patient preference of omeprazole versus lansoprazole for

GERD maintenance with regards to symptom control and side effects.

The purpose of the present study was to determine if patients perceived a difference in the efficacy, side effects, and value of omeprazole versus lansoprazole for GERD maintenance therapy after a formulary conversion, and to evaluate the costs of the conversion.

... METHODS ...

To answer these questions, an unblinded patient questionnaire, modified from the studies of Vigneri, Vivian, and colleagues,^{14,15} was developed. Pharmacy computer records were used to identify patients with GERD who had been on omeprazole for a minimum of 2 months prior to the formulary conversion and on lansoprazole for a minimum of 2 months following the conversion. Of these patients, 300 were randomly selected to receive a survey. The surveys were mailed between November 3, 1997, and January 10, 1998, and all patients were provided with a self-addressed, stamped envelope in order to return the survey.

To be included in the study, patients had to (1) have a diagnosis of GERD made by the patient's primary care provider; (2) have been treated with proton pump inhibitors for a minimum of 4 months (2 months on omeprazole followed by 2 months on lansoprazole); (3) be currently using lansoprazole for GERD maintenance therapy; and (4) return the survey. If any of these inclusion criteria were not met, the patient was excluded from the study. Patients who had previously complained of decreased efficacy or adverse drug reactions with lansoprazole were not included.

Patient Questionnaire

Patients were asked to rank the frequency and severity of their symptoms (pain, heartburn, and regurgitation) on a scale from 0 to 9 while on omeprazole and lansoprazole. Patients were also asked questions about the conversion process, side effects, their medication preference, and their perception of value with respect to their preferred PPI (Table 1).

Symptom Scores

Total symptom scores were calculated for omeprazole and lansoprazole. To calculate a total symptom score, the severity and frequency ratings given by a patient were divided by 3 to produce

Table 1. Patient Satisfaction Questionnaire

1. Why are you taking a proton pump inhibitor (circle one)

A. Acid reflux disease (heartburn)
 B. Ulcer treatment
 C. Don't know
 D. Other _____

2. If you are being treated for acid reflux disease (heartburn), please rate your frequency and severity of symptoms in the following areas with a score from 0 to 9 (0 = no symptoms, infrequent, 9 = intolerable, frequent symptoms)

On omeprazole (previous drug before the switch)

Frequency

Pain: 0 1 2 3 4 5 6 7 8 9
 Heartburn: 0 1 2 3 4 5 6 7 8 9
 Regurgitation: 0 1 2 3 4 5 6 7 8 9

Severity

Pain: 0 1 2 3 4 5 6 7 8 9
 Heartburn: 0 1 2 3 4 5 6 7 8 9
 Regurgitation: 0 1 2 3 4 5 6 7 8 9

On lansoprazole (new drug after the switch)

Frequency

Pain: 0 1 2 3 4 5 6 7 8 9
 Heartburn: 0 1 2 3 4 5 6 7 8 9
 Regurgitation: 0 1 2 3 4 5 6 7 8 9

Severity

Pain: 0 1 2 3 4 5 6 7 8 9
 Heartburn: 0 1 2 3 4 5 6 7 8 9
 Regurgitation: 0 1 2 3 4 5 6 7 8 9

3. Since converting from omeprazole to lansoprazole have your symptoms become (circle one)

A. Less frequent
 B. More frequent
 C. About the same

4. Since converting from omeprazole to lansoprazole have your symptoms become (circle one)

A. Less severe
 B. More severe
 C. About the same

5. If your symptoms are worse (answer 3B or 4B) has this affected your (circle all that apply)

A. Sleeping patterns
 B. Eating patterns (avoiding certain foods)
 C. Lifestyle

6. Are you satisfied with the way that the VA handled the conversion of your drugs (circle one)

A. Yes
 B. No
 C. Neutral

If no, how would you change it for the future?

7. Have you had any additional clinic visits because of this change (due to change in symptoms or side effects)

A. Yes—if yes, how many _____
 B. No
 C. About the same

8. Have you had any of the following side effects with either agent

Drug	<i>Omeprazole</i>	<i>Lansoprazole</i>
Diarrhea	_____	_____
Headache	_____	_____
Gas	_____	_____
Other (please specify)	_____	_____

9. If you had a choice would you prefer to be on (circle one)

A. Lansoprazole
 B. Omeprazole
 C. No preference

10. If you had a preference in Question 9 above and you had to pay for the preferred drug how much more would you be willing to pay (circle all that apply)

A. \$2 per month
 B. \$5 per month
 C. \$10 per month

adjusted ranks. Individual symptom scores for heartburn, pain, and regurgitation were calculated by multiplying the adjusted severity rank by the adjusted frequency rank for that particular symptom. The product of the adjusted severity and frequency ranks could range from 0 to 9. The total symptom score for each medication was calculated by summing the individual symptom scores for each of the 3 symptoms. Therefore, the possible range of a total symptom score for either lansoprazole or omeprazole is 0 to 27.

Statistical Analysis

In order to detect a 50% difference in total symptom scores, a power analysis ($\alpha = 0.05$, $\beta = 0.20$) demonstrated that approximately 100 patients would need to be surveyed. Nonparametric tests were used to analyze survey responses. The Wilcoxon signed rank test was used to evaluate total symptoms scores. The McNemar test was used to analyze the frequency of side effects. A one-sample chi-square test was used to analyze the frequency and severity of symptoms, patient satisfaction with the conversion, and proton pump inhibitor preference.

Cost Analysis

To estimate the annual cost savings as a result of the PPI conversion, the difference in cost between omeprazole and lansoprazole was multiplied by the number of GERD patients at our facility. This figure was then adjusted to account for the number of patients who were converted back to omeprazole because of an adverse drug reaction or treatment failure with lansoprazole and the additional clinic visits reported by the patients as a result of the PPI conversion.

... RESULTS ...

Three hundred surveys were mailed and 158 (52.6%) were returned. The demographics of the patients who completed the survey (responders) and those who did not (nonresponders) are shown in Table 2. The majority of the patients were male and the mean age of those who returned the survey was 65 years.

Total symptom scores of both PPIs were compared (Table 3). The median total symptom scores for omeprazole and lansoprazole were 1.33 and 1.34, respectively, and the difference between these scores was not statistically significant ($P = 0.28$).

The change in the frequency of symptoms after the conversion from omeprazole to lansoprazole was evaluated. Of the 153 patients who answered this question, 75 (49%) noted a change in the frequency of their symptoms; 31 (20%) reported less frequent symptoms, whereas 44 (29%) reported more frequent symptoms. The difference between these groups was not statistically significant ($P = 0.14$).

When asked if the severity of their symptoms had changed after converting from omeprazole to lansoprazole, 67 (44%) of the patients reported a change. When comparing those patients who reported less severe symptoms 25 (16%) to those who indicated their symptoms were more severe 42 (28%), a statistically significant difference was found between the 2 groups ($P < 0.03$).

The impact of the formulary conversion on the elements of quality of life was also assessed. A total of 65 patients reported 103 incidents where the conversion interfered with elements of quality of life. Of these patients, 40 (39%) noted a change in their sleeping patterns, 44 (43%) reported a change in their eating patterns, and 19 (18%) responded that they experienced a change in their overall lifestyle.

By survey response, a total of 17 patients reported that they required additional clinic visits as a result of the PPI conversion. Six patients reported 1 additional clinic visit, 5 patients reported 2 visits, 2 patients reported 3 visits, 2 patients reported more than 5 visits, and 2 patients could not remember the number of additional clinic visits.

With regards to adverse events, patients were divided into the following 4 groups: (1) those who experienced side effects to omeprazole but not lansoprazole (2%); (2) those who experienced side effects to lansoprazole but not omeprazole (28%); (3) those who experienced side effects with both omeprazole and lansoprazole (23%); and (4) those

Table 2. Patient Demographics

	Survey Responders	Survey Nonresponders
No.	158	142
Sex (M/F)	151/7	135/7
Age (y)		
Mean \pm SD	65 \pm 12	60 \pm 12
Range	37-92	28-89

who did not experience side effects with either agent (47%). The total number of patients who reported side effects to omeprazole and/or lansoprazole was 83. A statistically significant difference between the number of patients who reported side effects to only omeprazole (2%) versus those who experienced side effects with only lansoprazole (28%) was noted ($P < 0.001$).

The most commonly reported adverse events for both drugs were gas, headache, and diarrhea. Statistically, there were fewer patients who experienced gas (3 vs 29, $P < 0.001$), diarrhea (1 vs 15, $P < 0.01$) and headache (1 vs 22, $P < 0.001$) with omeprazole compared with lansoprazole. Table 4 summarizes the adverse events reported by the patients.

A total of 95 patients reported that if given a choice, they would choose 1 PPI over the other (Table 5). The difference between those patients who preferred omeprazole (64%) when compared to those who preferred lansoprazole (36%) was statistically significant ($P < 0.005$). Of the patients with a preference, 69% reported that they would be willing to pay an extra monthly fee in order to receive their preferred PPI. The majority of patients (62%) were willing to pay an additional \$2 per month for their preferred PPI. The percentages of patients who reported they would pay an additional \$5 or \$10 per month were 18% and 20%, respectively.

Overall, most patients were pleased with how the conversion from omeprazole to lansoprazole was managed by the VASDHS; 62% of patients reported they were satisfied, 22% reported they were unsatisfied, and 16% were neutral.

Cost Analysis

To estimate the annual cost savings as a result of the PPI conversion, we multiplied the difference in cost between omeprazole and lansoprazole by the 668 GERD patients at our facility. The acquisition cost is \$1.65 for either 15 mg or 30 mg of lansoprazole and \$1.87 and \$3.74 for 20 mg and 40 mg of omeprazole, respectively. To estimate the minimum expected cost savings, we used the 20-mg dose of omeprazole to calculate the difference in cost (\$0.16/day) between the PPIs assuming once-a-day dosing. The dose of 20 mg of omeprazole was used in the cost analysis because during the formulary conversion, patients who were receiving 20 mg of omeprazole were converted to 30 mg of lansoprazole. At a cost difference of

\$0.16/day, the potential savings per year is \$39,001. Because not all patients were successfully converted to omeprazole, the potential cost savings was adjusted to account for (1) the 100 patients who were switched back to omeprazole because of a documented adverse drug reaction or treatment failure with lansoprazole and (2) the estimated additional clinic visits associated with the PPI conversion. As previously stated, an additional 34 clinic visits were reported by 17 patients as a result of the conversion. This rate (34 visits per 158 patients surveyed) is equivalent to an extra 144 clinic visits for the 668 GERD patients. Also, if the 100 patients converted back to omeprazole needed at least 1 additional clinic visit, then the total number of additional clinic visits would be 244. Utilizing the Health Care Financing Administration reimbursement rate of \$40 per clinic visit, the potential cost savings of the conversion is offset by \$9,760 in additional costs. The final adjusted first year cost savings per year is \$29,251.

... DISCUSSION ...

Because of the high cost of proton pump inhibitors, many managed care organizations debate the issue of which PPI to select for formulary inclusion. In the 3 clinical trials that have compared omeprazole to lansoprazole in the treatment of GERD, the efficacy of these PPIs was assessed over a 4- to 8-week treatment period.¹⁶⁻¹⁸ None of these studies evaluated the efficacy of these PPIs in patients requiring chronic GERD maintenance therapy. Since there are no published, peer-reviewed, head-to-head trials comparing omeprazole and lansoprazole for GERD maintenance therapy, formulary decisions regarding the PPIs are often based on

Table 3. Total Symptom Scores for Omeprazole and Lansoprazole

	Omeprazole	Lansoprazole	P value
Median	1.33	1.34	0.28
Interquartile range	0-4.55	0.11-4.91	
Range	0-18.01	0-20.25	

Table 4. Adverse Events Reported by Patients

Adverse Event	Omeprazole Only (n)	Lansoprazole Only (n)	Omeprazole and Lansoprazole (n)	P Value*
Gas	3	29	27	<0.001
Diarrhea	1	15	8	<0.01
Headache	1	22	9	<0.001
Burning/pain	0	6	1	<0.05
Reflux	0	4	0	NS
Other	1	9	2	<0.02

*P value compares adverse events reported for omeprazole only to lansoprazole only.

gastric acid studies, ulcer efficacy studies, short-term (4- to 8-week treatment) GERD studies, and the PPI acquisition cost. A formulary switch from 1 PPI to another would be considered beneficial if it provided similar clinical outcomes, maintained patient satisfaction, and lowered drug costs. Using a patient questionnaire, we examined the impact of a formulary conversion from omeprazole to lansoprazole in patients requiring GERD maintenance therapy. We compared symptom control,

side effects, and medication preference between these 2 PPIs. We also assessed the patient's satisfaction with the conversion, the utilization of additional clinic visits, the interference with elements of quality of life, and the change in frequency and severity of symptoms after the PPI conversion.

The results of this study demonstrate that patients perceived no difference in total symptom control (heartburn, pain, and regurgitation) between omeprazole and lansoprazole ($P = 0.28$). Compared to omeprazole, the frequency of symptoms on lansoprazole therapy was not different ($P = 0.14$), yet the symptoms were more severe ($P < 0.03$).

Fewer patients reported adverse events with omeprazole compared to lansoprazole ($P < 0.001$). Although gas, diarrhea, and headache were the most common side effects reported for both PPIs, the incidence of all 3 side effects was significantly greater for lansoprazole (Table 4). More patients also reported burning, pain, and acid reflux with lansoprazole. These responses were included in the analysis of the adverse events, yet it is possible that they are not side effects but rather an indication of poor symptom control in these patients.

Forty-one percent of the patients who participated in this study reported the PPI conversion had impacted their activities of daily living. Most of these patients experienced a change in their sleeping patterns

Table 5. Survey Results

Frequency of Symptoms after Conversion		
Less frequent	20%	$(P = 0.14)$
More frequent	29%	
Severity of Symptoms after Conversion		
Less severe	16%	$(P < 0.05)$
More severe	28%	
Percentage of Patients Reporting Side Effects to Only One PPI		
Less severe	2%	$(P < 0.001)$
More severe	28%	
Percentage of Patients Reporting a PPI Preference		
Less severe	64%	$(P < 0.005)$
More severe	36%	

(39% of patients) and eating habits (43% of patients).

The majority of patients were satisfied with the manner in which the VASDHS handled the formulary conversion to lansoprazole. Although side effects were more common with lansoprazole, patients still continued therapy. Nevertheless, omeprazole was the preferred PPI ($P < 0.005$). Three factors may have contributed to this finding: (1) the increased severity of symptoms noted after the conversion, (2) the increased incidence of adverse events experienced with lansoprazole, and (3) the impact of the conversion on daily living activities, such as eating and sleeping. The finding that patients were willing to pay an extra fee for their preferred agent lends support to the idea that these 2 PPIs are not equivalent from the patient's perspective.

Although a few studies have examined the cost effectiveness of PPIs versus H₂-receptor antagonists in GERD maintenance therapy,^{19,20} none has compared omeprazole to lansoprazole. The cost effectiveness of PPI maintenance therapy is dependent on many factors, such as acquisition cost, GERD symptom control, the frequency of adverse events, and the increase in healthcare utilization resulting from medication failures. Depending on the institutional setting and the patient population, the impact of these variables in a cost-effectiveness analysis may differ. In this cost analysis study, the two variables that we examined were the PPI acquisition cost and the estimated increase in healthcare utilization (ie, increased clinic visits) as a result of the conversion. The estimated increase in the number of clinic visits due to the PPI conversion reduced the potential cost savings by 25%.

The results of this survey raise an important question faced by many managed care organizations today: how should the cost savings of a formulary conversion be weighed against patient preference and satisfaction? To date, there are no instruments we are aware of that can answer this question. From our survey, we learned that 64% of the patients preferred omeprazole. When this information is weighed against a savings of \$29,000, it appears that the PPI conversion may have lowered medication expenditures at the cost of patient satisfaction.

There are several limitations to this study. First, we used an unblinded questionnaire. Second, the patients who failed the conversion process were excluded from the study, thus biasing the study toward lansoprazole. Third, this was not a cross-over study in that all patients received omeprazole as the first proton pump inhibitor. Fourth, there is potential for recall bias because patients were asked to

remember the efficacy and side effects of omeprazole while currently receiving lansoprazole. For example, because the patients were currently receiving lansoprazole when they completed the survey, they could have better recall of their side effects from lansoprazole as compared to omeprazole. Also, patients who experienced side effects with lansoprazole could have biased memories of their experience with omeprazole just because of their current problems with lansoprazole. These memories might not accurately reflect the patient's true experience with either PPI. Fifth, bias toward omeprazole may have been introduced because of dissatisfaction with the conversion process. Sixth, the cost associated with long-term consequences of increased side effects or poor symptom control were not measured. Lastly, the cost of the pharmacist's time spent converting patients to lansoprazole, the cost of educating healthcare providers about the formulary conversion, and the cost of notifying patients by mail was not included in the cost analysis.

... CONCLUSIONS ...

Patients receiving maintenance therapy at the VASDHS for GERD preferred omeprazole. Fewer adverse events were reported with omeprazole. Patients were willing to pay an additional monthly fee for their preferred agent. Although the formulary conversion of omeprazole to lansoprazole has the potential to save approximately \$29,000 per year, this is a modest savings when compared to the annual drug budget of over \$10 million at the VASDHS. It appears that the cost savings may have come at the expense of patient satisfaction and suggests that healthcare facilities may want to pursue other strategies when attempting to lower medication expenditures for drugs that have not been thoroughly evaluated in head-to-head trials.

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