Assessment of Clinical, Service, and Cost Outcomes of a Conversion Program of Sumatriptan to Rizatriptan ODT in Primary Care Patients With Migraine Headaches

OLGA E. GERSHOVICH, PharmD; SARAH J. BILLUPS, PharmD; THOMAS DELATE, PhD; CAROLINE KICKLIGHTER HOFFMAN, PharmD, BCPS, CDE; and NIKKI CARROLL, MS

ABSTRACT

OBJECTIVE: Managed care organizations can increase the value of drug therapy by negotiating discounts on drug acquisition costs with pharmaceutical manufacturers and promoting use of preferred drugs, including the conversion of patients to preferred medications. This investigation was designed to assess conversion success, migraine drug utilizations, and patient satisfaction with a clinical pharmacist-managed conversion program from sumatriptan to rizatriptan ODT, both formulary drugs.

METHODS: This was a retrospective cohort study conducted in a managed care organization for patients aged 18 years or older who had picked up at least one outpatient prescription for any sumatriptan dosage form at the pharmacy between January 2002 and June 2002. Patients’ pharmacy and medical data were reviewed to assess eligibility (e.g., no history of rizatriptan failure) for conversion from sumatriptan to rizatriptan orally disintegrating tablet (ODT). There was no copayment difference for members for rizatriptan ODT versus sumatriptan. A questionnaire was developed to assess 2 domains: (1) patient satisfaction with the medication conversion process and (2) preference for rizatriptan ODT or sumatriptan. A random sample of 315 patients who initiated conversion to rizatriptan ODT was surveyed. Electronic pharmacy claims were reviewed to determine the number of patients who were successfully converted from sumatriptan to rizatriptan ODT. Pharmacy expenditures and total health care utilization and expenditures in the 180 days prior to baseline and after the conversion (follow-up) to rizatriptan ODT were compared for the cohorts of subjects who were successfully converted and those patients who were not successfully converted.

RESULTS: Therapeutic conversion from sumatriptan to rizatriptan ODT was attempted in 457 patients; 214 (47%) were successfully converted. The only difference between the 2 cohorts at baseline for the 6 months prior to attempted conversion was a higher mean number of sumatriptan doses per patient per month (PPPM) in the 243 failed conversions (mean 3.5, SD 2.9) compared with the 214 successful conversions (mean 2.8, SD 2.8; P = 0.003). The median triptan doses increased by 1.0 PPPM in both cohorts (P = 0.861) from 2.0 to 3.0 doses PPPM in the group of successful conversions and from 2.7 to 4.0 in the group of unsuccessful conversions. The survey response rate was 55% for both successful and unsuccessful conversions. More than 90% of the patients in both cohorts were satisfied with the level of care provided by the clinical pharmacy staff during medication conversion, and there was no difference between the 2 cohorts in patient satisfaction (P = 0.761). Rizatriptan ODT was preferred by 68.0% and 8.5% of successful and failed conversion subjects, respectively (P = 0.001). Using representative group purchase prices, triptan expenditures for successful conversion subjects were reduced by a median of $2.6% PPPM (P = 0.001) while triptan expenditures for unsuccessful conversions increased by a median of $8.2% PPPM (P = 0.001). There were no differences for either cohort in median PPPM changes in migraine-related office visits (0.0 median change in office visits, P = 0.748) or office-visit costs ($0 median change, P = 0.861) preconversion versus postconversion attempts. Regression modeling identified that lower total counts of sumatriptan doses filled during baseline period was an independent predictor of successful conversion to rizatriptan ODT (P < 0.001). There was an average of 3.5 triptan medication fills per patient for successful conversion during the 6-month follow-up period, with 76% of these subjects filling at least 2 prescriptions for rizatriptan ODT during this period.

CONCLUSIONS: This conversion program for sumatriptan to rizatriptan ODT was successful in converting almost half of primary care patients to the preferred product despite the absence of a copayment incentive for members to agree to the conversion. There were no measurable medical or economic consequences of the conversion, and patient satisfaction with the quality of care was maintained. Future efforts are likely to have a higher success rate if focused on converting patients with less-severe migraine headaches, as measured by the need for baseline rescue medication, since lower acuity was the only independent predictor of successful conversion in this conversion program for 2 triptan drugs.

KEYWORDS: Clinical pharmacy specialist, Triptans, Therapeutic interchange, Patient satisfaction

It is estimated that 6% of men and 18% of women in the United States suffer from migraine headaches. Approximately 10% of primary care office visits are for headaches, with the majority being for migraines.1 The impact of migraine headaches on pain, disability, and general health results in a significant financial burden as it is estimated that the U.S. spends $14 billion annually on migraine treatment, including missed workdays and associated loss of productivity.1

Migraine treatment consists of preventive and abortive therapy. The goals of preventive treatment are to decrease the severity, duration, and frequency of migraine attacks.2 Abortive therapy is required to treat migraine headaches when or if prophylactic medications do not prevent attacks. Patient preference surveys reveal that an ideal antimigraine agent would treat a migraine attack quickly and consistently while minimizing related symptoms such as nausea and vomiting, have minimal side effects, and be easy to use.2

Serotonin agonists, more commonly known as triptans, are most often used for abortive treatment of moderate to severe migraines. Several different triptan agents are available in a range of dosage forms. Unfortunately, among the agents, there are few direct comparisons with adequate sample sizes and power that support recommending one agent over another.3 When no clear evidence of superiority exists, economic pressures may encourage substitution of one agent over another in this high-cost medication class. Reports assessing patient satisfaction with migraine medications and medication conversion strategies within the triptan class are limited.3-5

Authors

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Due to changes in drug purchase contracts, it became economically advantageous in late 2001 to consider using rizatriptan orally disintegrating tablets (ODT, Maxalt MLT) for Kaiser Permanente Colorado (KP CO) patients who were using sumatriptan (Imitrex) products. Given that triptans can account for a significant percentage of a health care organization’s drug budget and efficacy and tolerability profiles appear equal among triptans, a decision was made to actively intervene to shift drug use from sumatriptan to rizatriptan ODT in patients who were naïve to the alternative product and willing to make this change. Both of these products remained on KP CO’s formulary, and there was no copayment incentive for members to convert to rizatriptan ODT from sumatriptan. A clinical pharmacy specialist-managed program to actively convert patients utilizing sumatriptan to rizatriptan ODT was undertaken within this health maintenance organization (HMO) from January to June 2002.

The purpose of this study was to examine, among sumatriptan-receiving migraine sufferers who initiated conversion to rizatriptan ODT, the following: (1) satisfaction with the care they received from their clinical pharmacy specialist during the conversion process, (2) preference for and satisfaction with the efficacy and tolerability of rizatriptan ODT versus sumatriptan, (3) medication and health care services utilization and expenditures associated with the conversion process, and (4) patient characteristics predictive of a successful conversion to rizatriptan ODT.

Methods

Setting

This study was conducted in a not-for-profit group-model HMO with enrolled members receiving care at 16 medical offices in the Denver/Boulder metropolitan area. Each medical office is staffed by 1 to 3 primary care clinical pharmacy specialists (PCCPSs) who assist health care providers and patients with medication-related problems and promote cost-effective use of medications. Approval was obtained from the KP CO Institutional Review Board for this study.

Study Design

This study used a retrospective cohort design. Patients were surveyed regardless of whether they were successfully or unsuccessfully converted from sumatriptan to rizatriptan ODT. The 2 principal domains of the survey were satisfaction with clinical pharmacy services and satisfaction with the triptan medications that the patients used. In addition, integrated electronic pharmacy and medical record data were examined to assess the successful conversion rates during the 180 days after the conversion attempt and to measure changes in migraine medication and health care service utilization and expenditures during the 180 days before and after conversion initiation. An a priori sample size calculation revealed that for an ±8% survey sampling error, a minimal sample size of 150 patients was required. Assuming an estimated 50% response rate, questionnaires were sent to 315 patients.

Patient Population

Patients aged ≥18 years who had picked up at least one prescription for any sumatriptan dosage form (tablet, nasal spray, or subcutaneous injection) at the pharmacy between the dates of January 1, 2002, and June 30, 2002, were identified from electronic pharmacy claims data. Patients whose membership had been terminated or who had died within 6 months of the program being initiated were excluded. Patients’ electronic medical records were reviewed by PCCPS staff to assess eligibility for conversion from sumatriptan to rizatriptan ODT. Patients with a history of failing rizatriptan ODT due to intolerance or self-reported lack of efficacy or whose provider did not authorize conversion were ineligible for medication conversion. PCCPS staff contacted eligible patients by telephone, starting in August 2002, and offered conversion from sumatriptan to rizatriptan ODT. Patients who agreed to convert were instructed to finish their sumatriptan doses before filling their new prescription for rizatriptan ODT.

Outcome—Patient Satisfaction

To assess patient satisfaction with the conversion process, a questionnaire was developed to assess 2 domains: (1) patient satisfaction with the medication conversion process, including an assessment of care given by the primary care clinical pharmacy specialist, and (2) preference for rizatriptan ODT or any sumatriptan product, including oral tablet, intranasal spray, or subcutaneous injection. Items for these domains were compiled from validated questionnaires. Domain #2 was assessed only among patients who had received at least 1 prescription for rizatriptan ODT after conversion from sumatriptan. Responses to the questions were recorded on a 5-point scale ranging from “completely disagree” to “completely agree.” These responses were converted to a 3-point scale combining “completely agree [or disagree]” and “somewhat agree [or disagree]” and maintaining a neutral response.

Questionnaires were mailed to a sample of patients randomly selected from the eligible patients who were contacted by the PCCPS. Each questionnaire was coded with a unique patient identification number different from the KP CO health record number in order to maintain patient confidentiality. The first mailing of the questionnaire took place in October 2002, followed by a second mailing one month later to patients who failed to respond to the first survey. An introduction letter that explained in detail the background history and the reasons for the mailing was mailed together with the questionnaire.

Outcome—Conversion Rate

Electronic pharmacy claims data were analyzed to determine if patients were successfully converted from sumatriptan to rizatriptan ODT. Patients were categorized as “initiated conversion to rizatriptan ODT” if they had received one or more prescriptions for rizatriptan ODT or if a prescription had been ordered but not picked up at the pharmacy and there was a note in the patient’s
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### TABLE 1
ICD-9-CM Codes Used to Capture Migraine-Related Office Visits and Costs

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
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<tr>
<td>307.81</td>
<td>Tension headache</td>
</tr>
<tr>
<td>784.0</td>
<td>Headache</td>
</tr>
<tr>
<td>346.20</td>
<td>Variants of migraine without mention of intractable migraine</td>
</tr>
<tr>
<td>346.00</td>
<td>Classical migraine without mention of intractable migraine</td>
</tr>
<tr>
<td>346.01</td>
<td>Classical migraine with intractable migraine, so stated</td>
</tr>
<tr>
<td>346.02</td>
<td>Classical migraine with intractable migraine, so stated</td>
</tr>
<tr>
<td>346.10</td>
<td>Common migraine without mention of intractable migraine</td>
</tr>
<tr>
<td>346.11</td>
<td>Common migraine with intractable migraine, so stated</td>
</tr>
<tr>
<td>346.81</td>
<td>Other forms of migraine without mention of intractable migraine</td>
</tr>
<tr>
<td>346.80</td>
<td>Other forms of migraine with intractable migraine</td>
</tr>
<tr>
<td>346.9</td>
<td>Unspecified migraine</td>
</tr>
<tr>
<td>346.90</td>
<td>Unspecified migraine without mention of intractable migraine</td>
</tr>
<tr>
<td>346.91</td>
<td>Unspecified migraine with intractable migraine, so stated</td>
</tr>
</tbody>
</table>


### FIGURE 1
Adjusted Odds Ratios for Atomoxetine Initiation Based on Diagnostic History and Demographics

- 84 Disenrolled or Deceased
- 260 Excluded:
  - Low Sumatriptan Utilizer (34%)
  - Patient Wasn’t Contacted (30%)
  - Prior Rizatriptan ODT Failure (14%)
  - Patient Refusal (13%)
  - Followed by Neurology (7%)
  - Other (2%)
- 717 Continuously Eligible
- 457 Initiated Conversion From Sumatriptan to Rizatriptan ODT
- 214 Successful Conversions
- 243 Failed Conversions:
  - 146 Switched Back to Sumatriptan (60%)
  - 63 Taking Both Medications (26%)
  - 34 Never Picked Up Rizatriptan ODT (14%)
- 315 Sampled for Satisfaction Questionnaire
- 173 (54.9%) Returned Questionnaires
- 82 Successful Conversions (55.0% Response Rate)
- 91 Failed Conversions (54.8% Response Rate)

Outcome—Drug and Medical Visit Utilization and Expenditures

The perspective of the payer was used for the economic analyses. Medication expenditures were calculated as the total cost of triptan medications and other medications indicated for migraine-abortive therapy in the Kaiser Permanente Management of Migraine Headaches Guidelines (i.e., isometheptine compound, dihydroergotamine, ergotamine and caffeine suppositories, ketorolac, and meperidine). Expenditures for these medications dispersed 180 days prior to (baseline) and after (follow-up) the switch date for each patient were tabulated in 2002 U.S. dollars. Pharmacy expenditures for rizatriptan ODT were calculated using representative group purchasing costs (i.e., 2002 Federal Ceiling Prices, which are the average manufacturer’s price [approximately 8% less than average wholesale prices (AWPs)] less 24% for brand-name medications).

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### Statistical Analysis

The distributions of observations for interval-level and ratio-level baseline and outcome variables were assessed. Mean differences between groups for normally distributed data were compared using the independent samples *t* tests. Median differences between groups for nonnormally distributed data (i.e., office visits,
expenditures, doses) were compared using the nonparametric Wilcoxon rank sum test. Proportional differences between groups for dichotomous variables (i.e., gender, sumatriptan dosage forms, and survey responses) were compared using chi-square tests. Modeling of conversion success was performed utilizing logistic regression. The model regressed age, gender, and total baseline counts of sumatriptan doses and other migraine medications and migraine-related office visits on conversion success. The alpha level for all statistical tests was set at 0.05.

Results

A total of 801 patients were screened for conversion from sumatriptan to rizatriptan ODT (Figure 1). PCCPS staff successfully contacted and initiated conversion in 457 of these patients. Nearly one half (47%) of these conversions were successful. The reasons for not initiating conversion were: (1) low sumatriptan utilization (defined as less than one sumatriptan refill per 4 months) (34%), (2) unable to contact the patient (30%), (3) history of failing treatment with rizatriptan ODT (14%), (4) patient refusal (13%), and (5) patient required care from a specialist (i.e., neurologist) (7%).

The majority of subjects were middle-aged and female (Table 2). The mean number of sumatriptan doses received per patient per month (PPPM) in the 180 days prior to conversion initiation was 2.7 and 3.5 for successfully converted subjects versus failures, respectively (P = 0.003). One hundred seventy-three (55%) of the 315 questionnaires were returned. The proportion of successful conversions in the group that returned a questionnaire (82 of 173, 47%) was equivalent to that in the entire sample evaluated (214 of 457, 47%) (P = 0.969).

Characteristics of the 173 patients who responded to the questionnaire (responders) were compared with the 142 patients who did not respond (nonresponders). The 2 groups did not differ in terms of gender (P = 0.811); baseline dosage form of sumatriptan (tablets P = 0.100, spray P = 0.414, injection P = 0.475); and total count of baseline sumatriptan doses (tablets P = 0.443, spray P = 0.826, injection P = 0.661). Responders were slightly older than the nonresponders (mean age = 49.9 vs. 46.8 years, respectively; P = 0.017); however, this did not appear to be clinically meaningful.

The majority of respondents were satisfied with the level of care provided by their PCCPS, regardless of whether they converted to rizatriptan ODT successfully or not (Figure 2). Most respondents rated the care they received from the clinical pharmacist the same as that from other health care professionals (64.6% and 59.4% for conversion failures and successes, respectively, P = 0.761). Sixty-eight percent of the successfully converted respondents preferred rizatriptan ODT to sumatriptan, while only 8.5% of respondents who failed conversion rated rizatriptan ODT as the preferred medication (P < 0.001, Figure 3). Successful conversion respondents rated rizatriptan ODT as providing faster and more complete headache relief (51.9% and 45.0%, respectively) while failure respondents reported that sumatriptan provided faster and more complete headache relief (78.3% and 75.9%, respectively, both P < 0.001). As an additional measure of satisfaction, refill rates for rizatriptan ODT in the follow-up period were assessed. Seventy-eight percent of successfully converted subjects filled at least 2 rizatriptan ODT prescriptions, suggesting that most patients were sufficiently satisfied with rizatriptan ODT to refill their prescription for this medication.

Using group purchase costs estimated to be representative, triptan expenditures in the 180 days after conversion attempt were reduced compared with baseline in successful conversions but not in failed conversions (a median reduction of -$2 PPPM in successful conversions versus an increase of $8 PPPM in failed conversions, P < 0.001) (Table 3). There were no differences in the baseline and follow-up changes between the cohorts in (1) nontrip坦 migraine doses received (P = 0.970) and migraine medication expenditures (P = 0.748) and (2) migraine-related office visits (P = 0.611) and migraine-related office visit expenditures (P = 0.861). Regression modeling identified the total count of sumatriptan doses filled during the 180 days prior to conversion attempt as an independent predictor of successful conversion to rizatriptan ODT (β-coefficient = -0.016, P = 0.006). The negative correlation indicates that, with all other characteristics being equivalent, fewer sumatriptan doses received during the baseline period increased the likelihood of successful conversion (Table 4).

Discussion

Converting patients from a given medication to a “preferred” agent within the same class has become a common practice in the health care community when opportunities exist for same or better clinical or humanistic outcomes at lower cost.6,17 To our knowledge, this is

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Successful Conversions (n = 214)</th>
<th>Failed Conversions (n = 243)</th>
<th>P Value</th>
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<tr>
<td>Mean age (years) [SD]</td>
<td>48.3 [11.7]</td>
<td>49.7 [10.4]</td>
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<tr>
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<td>10.8</td>
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<td>% of patients who used this sumatriptan dose form</td>
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<tr>
<td>Nasal spray</td>
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<td>10.7</td>
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<tr>
<td>Total</td>
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<td>Mean no. of sumatriptan doses PPPM [SD]</td>
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* At time of conversion initiation.
† The totals exceed 100% because some patients were using more than one sumatriptan dose form.
‡ PPPM = per patient per month.
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the first evaluation of patient preference, satisfaction, and conversion rates in the conversion of migraine medications in a managed care patient population.

Overall, we found that respondents were satisfied with the care they received from their clinical pharmacy specialist during the conversion process. This is an important finding since headache sufferers, as a group, tend to be among the most dissatisfied patients.18 Even respondents in our study who failed medication conversion reported satisfaction with the care they received from the clinical pharmacy specialist. Medication conversion programs utilizing different types of medications have evaluated patient satisfaction with care and reported mixed results. Grace et al. performed a medication conversion program with HMG-CoA reductase inhibitors in 942 patients in a Veteran's Administration medical center.19 Like ours, this program involved clinical pharmacists in the conversion process. Unlike our study, where satisfaction was measured in both successful and unsuccessful conversions, patient satisfaction was measured only in subjects who continued on their new medication and met their low-density lipoprotein cholesterol goal. Of the 755 subjects surveyed, 93.6% reported satisfaction with the care they received at the clinic.19

We found that a large majority of subjects (87%) in our program who failed conversion to rizatriptan ODT expressed an overall preference for sumatriptan. This is not a surprising finding considering that all of the subjects who initiated conversion in our study had been sumatriptan users, and most had been using this medication for months or even years. Clinical trials with triptans have reported comparable patient preference, efficacy, and tolerability between sumatriptan and rizatriptan ODT,14,15 but the design of these clinical trials were substantially different from our study in that they compared parallel groups of subjects who were not stabilized on one of the study medications (as was the case in our study). Research with 2 medications from a different class of drugs also with no significant differences in efficacy or safety found that about half of the patients converted from omeprazole to lansoprazole reported worsening symptoms of heartburn.20

Nearly half of the subjects (47%) in our study who initiated conversion were successfully converted from sumatriptan to rizatriptan ODT. This result was accomplished without change in the number or cost of migraine-related office visits. A similar conversion rate (41%) was reported by Savani et al. in a conversion program for sumatriptan to other triptans.21 However, Savani et al. found that medication and health care cost savings were generated only among the subjects for whom the switch was successful, leading the authors to conclude that there was no economic justification for switching from sumatriptan to another triptan.21 Our study differed in that our conversion program was carried out by clinical pharmacy specialists who, if desired, were available to

* The response rate was 55.0% in the successful conversions and 54.8% in the failed conversions.

F=failed conversions  S = successful conversions.
patients for personal consultation. The medication conversions made by Savani et al. were carried out in a general practitioner's office and didn't necessarily include the same education and opportunity for direct telephone follow-up provided in our study.21

We found important decreases in medication expenditures, using estimated representative group purchasing costs, for the subjects successfully converted to rizatriptan ODT that offset the small rise detected among conversion failure subjects. We expected no effect of this triptan conversion program on migraine-related office visit utilization or expenditures and found no evidence for a change in migraine-related office visit use or expenditures. Thus, our findings support implementation of pharmacist-directed conversion programs for triptan medications when health plans are able to reduce the acquisition costs of preferred drugs through negotiation with pharmaceutical manufacturers.

We found that subjects who had received greater numbers of sumatriptan doses in the 180 days prior to conversion initiation tended to be less likely to convert to rizatriptan ODT. This finding suggests that a triptan conversion intervention may be less successful with patients who use more of the triptan medication due to reasons that might include poor control of migraines, higher severity of illness, or simply more familiarity with the triptan that is the target of the intervention. Furthermore, this suggests that triptan conversion programs may require more than passive intervention to be successful with higher-use patients, particularly in the absence of a copayment or other incentive for members to participate in the conversion. Previously published research in this group-model HMO for statin, cholesterol-lowering statin drugs found that a clinical-pharmacy-directed conversion program for simvastatin to lovastatin in which members had a copayment incentive to use the preferred drug was associated with a 95.5% success rate in conversions, with improved clinical outcomes and cost savings.22

While we did convert nearly half of the enrolled migraine patients from sumatriptan to rizatriptan ODT, we believe that this result could be improved. Given the substantial number of migraine patients in this HMO who were not contacted during this program, it is possible that a systematic contact system utilizing mail or phone would increase the number of conversions. Systematically providing prophylactic medications to patients could

* The response rate was 55.0% in the successful conversions and 54.8% in the failed conversions.

F = failed conversions   S = successful conversions.

![Figure 3: Triptan Preference in Conversion Failures versus Conversion Successes](image-url)
TABLE 3 Per-Patient-Per-Month (PPPM) Migraine Medication and Medical Office Utilization and Costs in the 180 Days Before and After Conversion Among Patients Successfully and Unsuccessfully Converted to Rizatriptan ODT

<table>
<thead>
<tr>
<th>Migraine Medication and Medical Office Utilization</th>
<th>Successful Conversions n=214</th>
<th>Unsuccessful Conversions n=243</th>
<th>P Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconversion triptan doses</td>
<td>2.0 (2.7)</td>
<td>2.7 (3.5)</td>
<td></td>
</tr>
<tr>
<td>Change in triptan doses</td>
<td>3.0 (3.6)</td>
<td>4.0 (4.4)</td>
<td></td>
</tr>
<tr>
<td>Change in triptan doses</td>
<td>1.0 (0.9)</td>
<td>1.0 (0.9)</td>
<td></td>
</tr>
<tr>
<td>Preconversion triptan expenditures†</td>
<td>$35 ($50)</td>
<td>$46 ($67)</td>
<td>0.882</td>
</tr>
<tr>
<td>Postconversion triptan expenditures</td>
<td>$32 ($42)</td>
<td>$57 ($73)</td>
<td></td>
</tr>
<tr>
<td>Change in triptan expenditures</td>
<td>$2 (-58)</td>
<td>$8 ($56)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Preconversion nontriptan migraine medication doses</td>
<td>0.0 (4.9)</td>
<td>0.0 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Preconversion nontriptan migraine medication doses</td>
<td>0.0 (4.1)</td>
<td>0.0 (3.0)</td>
<td></td>
</tr>
<tr>
<td>Change in nontriptan migraine medication doses</td>
<td>0.0 (0.8)</td>
<td>0.0 (0.3)</td>
<td>0.970</td>
</tr>
<tr>
<td>Preconversion nontriptan medication expenditures</td>
<td>$0 ($2)</td>
<td>$0 ($1)</td>
<td></td>
</tr>
<tr>
<td>Preconversion nontriptan medication expenditures</td>
<td>$0 ($2)</td>
<td>$0 ($1)</td>
<td></td>
</tr>
<tr>
<td>Change in nontriptan medication expenditures</td>
<td>$0 (-$0)</td>
<td>$0 (+$0)</td>
<td>0.748</td>
</tr>
<tr>
<td>Migraine office visits§</td>
<td>0.0 (0.1)</td>
<td>0.0 (0.1)</td>
<td></td>
</tr>
<tr>
<td>Migraine office visits§</td>
<td>0.0 (0.1)</td>
<td>0.0 (0.1)</td>
<td></td>
</tr>
<tr>
<td>Migraine office visits§</td>
<td>0.0 (-0.0)</td>
<td>0.0 (-0.0)</td>
<td></td>
</tr>
<tr>
<td>Preconversion migraine-related office visits</td>
<td>$0 ($10)</td>
<td>$0 ($4)</td>
<td></td>
</tr>
<tr>
<td>Preconversion migraine-related office visits</td>
<td>$0 ($8)</td>
<td>$0 ($3)</td>
<td></td>
</tr>
<tr>
<td>Change in migraine-related office visit expenditures</td>
<td>$0 (-$2)</td>
<td>$0 (-$1)</td>
<td>0.861</td>
</tr>
</tbody>
</table>

* P value determined by Wilcoxon rank sum test.
† Based on medication costs estimated to be representative of group purchase contracts for rizatriptan ODT and discounted average wholesale prices (AWPs) for other migraine medications, i.e., 2002 Federal Ceiling Prices, which are the average manufacturer’s price (approximately 8% less than AWPs) less 24% for brand-name medications. (Available at: http://www.ppsv.com/issues/drug_glossary.htm. Accessed March 21, 2006.)
‡ Nontriptan medications included in this category: sumatriptan, zolmitriptan, rizatriptan, almotriptan, eletriptan, naratriptan, rizatriptan ODT, and sumatriptan ODT.
§ The ICD-9-CM codes used to capture migraine-related office visits and costs are shown in Table 1. Expenditures were assigned to these office visits using the 2001 and 2002 Resource-Based Relative Value Scale, depending upon the date of the visit.*

TABLE 4 Model* of Ability to Predict Conversion Success from Subjects’ Baseline Characteristics

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>β-Coefficient</th>
<th>P Value</th>
<th>Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>-0.0085</td>
<td>0.331</td>
<td>0.99 (0.96-1.01)</td>
</tr>
<tr>
<td>Male</td>
<td>-0.3182</td>
<td>0.279</td>
<td>0.73 (0.41-1.30)</td>
</tr>
<tr>
<td>Sumatriptan doses received†</td>
<td>-0.0166</td>
<td>0.006</td>
<td>0.98 (0.97-0.99)</td>
</tr>
<tr>
<td>Other migraine drug doses received†</td>
<td>0.0016</td>
<td>0.154</td>
<td>1.01 (0.99-1.01)</td>
</tr>
<tr>
<td>Migraine office visits†</td>
<td>0.2135</td>
<td>0.080</td>
<td>1.24 (0.98-1.57)</td>
</tr>
</tbody>
</table>

* Hosmer and Lemeshow Goodness-of-Fit, P=0.700.
† Number of doses counted during the 180 days prior to the conversion attempt; includes the combined number of doses for all 3 dosage forms: tablets, nasal spray, and injection.

have improved clinical and economic outcomes. Drug prophylaxis for migraine reduces expenditures on abortive therapies, and an intervention program that increases the use of prophylaxis could be cost beneficial.23,24 Focusing conversion efforts on patients who are low or moderate utilizers of triptan medications may also increase the proportion of conversion successes. In addition, a systematic method for tracking patient follow-up after the conversion may assist in maintaining conversion, especially among patients who are using both sumatriptan and rizatriptan ODT after initiating conversion. Updated guidelines for therapeutic inter-change25 constitute a helpful tool for future conversion projects within health care organizations since measuring the impact of the conversion programs is one of the current requirements.

Limitations

Among the limitations of the present study is the absence of a control group of triptan patients who were not subject to the conversion program. Thus, our results may be only suggestive of the possible outcomes of an intervention to convert patients from sumatriptan to rizatriptan ODT. Second, our assessment of migraine severity was limited to the total counts of triptan doses used in the preperiod. Therefore, the role that disease severity played in the failure to convert patients to rizatriptan ODT could not be thoroughly assessed.

The patient satisfaction questionnaire was not a validated instrument but was composed of items from validated instruments.3-5,8-10,12 Because the individual items were assessed as individual outcomes, we believe they are valid measures. Potential recall bias may have been introduced by surveying patients after their conversion attempt. However, subjects were surveyed within 10 months of their conversion attempt and provided detailed instructions as to the nature of the survey in an attempt to limit the potential for recall bias.

We excluded patients followed by the neurology department of this HMO. This exclusion was based on the clinical judgment that these patients were likely to be more complicated and require more intensive therapy than those typically seen in primary care. In addition, we did not account for the costs of the clinical pharmacy specialists or other administrative costs in the economic analysis. Since the specialists were available for consultation for
both cohorts, we believe that this cost most likely would have been borne equivalently by both cohorts. Nevertheless, the administrative costs in conducting any clinical intervention are an important factor in determining the economic value of the intervention, and other organizations will no doubt choose to estimate this cost when assessing the potential cost-effectiveness of a conversion program in their patient population.

Two other methodological limitations may be important. We followed subjects for 180 days after conversion initiation. A longer follow-up period may have provided different results since the above-mentioned large retrospective U.K. study\(^\text{11}\) reviewed results of their triptan conversion project over a 15-month period. Nevertheless, we are confident that the outcomes in our investigation were assessed after a meaningful length of time. Second, future research might consider defining conversion success after 2 pharmacy claims rather than 1 pharmacy claim for the preferred drug. Some migraineurs experience infrequent migraines and may use leftover medication from an earlier prescription. A second pharmacy claim for the converted drug would provide more assurance of the successful conversion.

## Conclusions

Without a copayment incentive for members to change therapy, the conversion of sumatriptan to rizatriptan ODT was successful in nearly half of the patients for whom conversion was attempted, without adverse medical or economic consequences, while maintaining patient satisfaction with the quality of their care. In the era of rising health care costs, conversion projects may help health care organizations increase affordability while maintaining high patient satisfaction and quality of care.

### DISCLOSURES

No outside funding supported this study. The authors disclose no potential bias or conflict of interest relating to this article. This work was presented at the 23rd Annual Western States Residency Conference, May 2003, Airlamar, California. Author Olga E. Gershovich served as principal author of the study. Study concept and design were contributed by Gershovich and author Sarah J. Billups, with input from author Caroline Kicklighter Hoffman. Data collection was primarily the work of Gershovich, with input from Billups and author Nikki Carroll. Data interpretation was the work of Billups and author Thomas Delate, with input from Gershovich and Carroll. Drafting of the manuscript and its revision were primarily the work of Gershovich, with input from Billups, Delate, and Hoffman.

### REFERENCES


