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Triptan Education and Improving Knowledge for Optimal Migraine Treatment; An Observational Study

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Abstract

Background—It is generally felt that patient education and patient knowledge regarding triptan use for acute migraine management is important for successful and safe treatment. It is unclear how knowledgeable triptan users are regarding their triptan, how much education occurs when triptans are prescribed, and the impact patient education has on actual patient knowledge regarding triptan use.

Objective—The primary objective was to compare triptan users' self-perceived knowledge and actual knowledge about the triptans in patients who report having received triptan education vs. patients who report not having received triptan education.

Methods—This was a multi-center prospective observational study of 207 migraine patients who were using triptans for abortive therapy and who were being evaluated as new patients at academic headache specialty clinics in the United States. Patients completed standardized questionnaires regarding their self-perceived knowledge about the triptans, their actual knowledge regarding the triptans, and the perceived education about the triptan that they had received at the time of prescription.

Results—Although greater than 80% of subjects reported receiving education about when to take the triptan and the number of doses they could take for a headache, only 71.5% reported receiving education about triptan side effects, 64% for the number of triptan doses they could take each week/month, 64% for taking other medications with the triptan, and 49% for medical contraindications to triptan use. Compared to subjects who did not recall receiving education about when to take their triptan, subjects who recalled such education had a statistically significant greater actual knowledge for taking the triptan immediately after a headache begins (91% vs. 77%, $p=.049$; CI: .00-.33), treating when pain is mild (75% vs. 50%, $p=.009$; CI: .04-.45), understanding that they do not need to fail treatment with over-the-counter medications before taking a triptan (74% vs. 42%, $p=.001$; CI: .11-.51), and recognizing that coronary artery disease is a contraindication to triptan use (40% vs. 19%, $p=.001$; CI: .09-.34).

Conclusion—This study provides evidence that patients who recall having received education at the time of triptan prescribing have greater knowledge regarding optimal triptan use. Triptan users

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who recalled having received this education had greater recognition of the importance of taking the triptan immediately at the onset of a headache, treating when pain is mild, not needing to fail treatment with OTC medications before taking a triptan, and understanding that coronary artery disease is a contraindication to triptan use.

Keywords

Migraine; Triptans; Headache; Patient Education; Migraine Treatment

Introduction

Patients' compliance and response to treatment is dependent on a multitude of variables. These variables include not only knowledge regarding the medication, but also health-care interactions including attention, bedside manner, empathy, positive regard, compassion, hope, and enthusiasm.¹ Balint stated that what mattered was "not only the medicine or the pills, but the way the doctor gave them to the patient; in fact the whole atmosphere in which the drug was given".² It has been suggested that the quality of the interaction between physician and patient can be extremely influential in patient outcomes, and patient and provider expectations may be more important than specific treatment.³ Many studies have shown that practitioners who attempted to influence patients' beliefs about the effects of therapy in a positive optimistic manner compared to a negative or neutral manner had a significant impact on patients' health outcomes.⁴⁻¹³ Appropriate information and patient involvement in choice of treatment options are associated with resolution of emotional and physical symptoms, greater treatment compliance, improved satisfaction, and fewer repeated consultations, referrals, and investigations.^{14, 15} The importance of patient-physician communication and agreement on care and treatment plan has been associated with improved patient adherence and compliance with prescribed medication, as well as health outcomes in many studies.¹⁵⁻²²

Effective patient education regarding a prescribed therapy leads to greater adherence, improved safety, and better overall therapeutic health outcomes, including improved triptan knowledge for effective use^{14, 15, 23-33}. The focus of our study was to evaluate the extent that patients were receiving triptan education at time of prescription, and to determine if that education was associated with increased knowledge to optimize safe and effective triptan use.²³⁻²⁸ Knowing how knowledgeable patients already are about their prescribed migraine medication when they initially present to a headache specialty clinic would assist headache specialists in determining the amount and content of education they should deliver to their patients. Furthermore, knowing the coherence between patients' self-perceived knowledge regarding treatments and their actual knowledge allows for clinicians to react appropriately when a patient reports that they already feel knowledgeable about a treatment. In addition, identifying lapses in education that occur prior to a patient seeing a headache specialist can also lead to efforts aimed at improving the delivery of patient education outside of the specialist's office.

In this study, conducted by the American Headache Society Headache Fellows Research Consortium, new patients presenting to a specialty headache clinic who were using triptans

for migraine abortive therapy completed questionnaires that assessed their self-perceived knowledge about the triptans, their actual knowledge regarding the triptans, and whether they received triptan education. Data provide insights into the perceived content of triptan education that patients received prior to presenting to an academic headache center, how knowledgeable patients think they are about their triptan, how this self-perceived knowledge correlates with actual triptan knowledge, and whether or not knowledge associates with a perception of having received education at the time of prescribing.

Methods

This was a multi-center prospective observational study performed at tertiary care academic headache specialty clinics in the United States. Headache Fellows participating in their headache training in UCNS accredited fellowship programs between July 2009 and June 2012 and their Fellowship Directors served as investigators. IRB approval was obtained at each participating center and all subjects completed the informed consent process prior to study participation.

Subjects were new adult patients 18 years of age or older who had episodic migraine or chronic migraine according to ICHD-II diagnostic criteria and were current users of a triptan medication.³⁴ “Current use” was defined as having used a triptan within the prior 3 months and having used triptans for at least 1 year. Subjects were identified by the investigators, and although the original goal was for consecutive patients to be enrolled, ultimately this was a convenience sample. Patients with abortive medication overuse according to ICHD-II criteria were not excluded. Patients who were unable to read or speak English were excluded, as were those with limited mental capacity. Headache diagnoses were made following a semi-structured interview performed by the Headache Fellow using study questionnaires. Data regarding patients’ self-perceived knowledge about the triptans, actual knowledge regarding the triptans, and the triptan education that they had previously received were collected via subject completion of standardized questionnaires. The triptan education could have been delivered by the prescriber, other clinicians in the prescriber’s office, or the pharmacist.

Questions that assessed patient knowledge were written by the study investigators with the intent of asking patients about some of the most important aspects of safe and effective triptan treatment; how to know when to take the triptan, the timing for taking the triptan, dose limits, combining triptans with other medications, and contraindications to taking the triptan. The questions were discussed and piloted amongst study investigators and members of the research team, but there was not a specific pilot study of migraine patients prior to initiating the current study.

For all of statements in the standardized questionnaires, subjects responded using a 5-point Likert scale that included the following responses: “strongly agree”, “agree”, “neither agree nor disagree”, “disagree”, or “strongly disagree”. For knowledge statements that were true, “strongly agree” and “agree” were considered correct subject responses, while any other response was considered incorrect. For knowledge statements that were false, “strongly disagree” and “disagree” were considered correct subject responses while any other response

was considered incorrect. For education statements, “strongly agree” and “agree” responses were interpreted to identify subjects as considering themselves to have been educated, while any other response was interpreted as the subject not receiving the stated education.

All data were submitted to the principal investigators at the coordinating site where data were entered into a secure database. All data entry was double checked for accuracy. Statistical analyses were performed at the coordinating center. Descriptive statistics were used to determine subject demographics, headache diagnoses, headache characteristics, subject self-perception of knowledge about the triptans, actual subject knowledge about the triptans, and education that subjects report they received about the triptan at the time it was prescribed. Pearson chi-square tests were used to compare actual knowledge amongst subjects who self-perceived themselves as being knowledgeable vs. subjects who self-perceived themselves as not being knowledgeable and to compare actual knowledge amongst those reporting that they received education vs. those reporting not receiving education. P-values of $<.05$ were considered significant.

Results

Data from 207 subjects were available for this study. However, for the questions evaluated throughout the Tables and Figures, some questions have 206 responses instead of 207 due to missing data (e.g. subject skipped that question). Average age was 42.5 years (± 12 years), 90% were female, and 89% were Caucasian. Fifty-nine percent of subjects had episodic migraine and 41% had chronic migraine. Twenty-five percent of all subjects had at least occasional migraine with aura. Eighteen percent overused abortive migraine medications. The mean number of years with migraine was 23.5 $\pm$ 13.1 (median = 22, max = 60, min = 3). The mean frequency of headache days per month was 13.2 $\pm$ 9.1 (median = 10; max = 30; min = 1).

Patients’ self-perception of their triptan knowledge revealed that the majority did not think it was complicated to understand how and when to take the triptan, felt educated about their triptan, and felt that they were aware of triptan side effects (Table 1).

Patients’ actual triptan knowledge supported their self-perception of knowledge for most of the questions, with the exceptions that the majority incorrectly recognized that coronary artery disease was a contraindication to triptan use, thought that they could not use OTC pain medications for the same headache after a triptan was taken, and felt that depression was a contraindication to triptan use (Table 2).

Comparisons to determine whether patient self-perceptions of knowledge matched their actual knowledge regarding how and when to take the triptan are shown in Figure 1. Regardless of whether the subjects were grouped into those that either felt that it is or is not complicated to understand how and when to take the triptan, the majority in both groups answered all actual knowledge questions on these topics correctly. There were no significant differences in actual knowledge between these two groups in regards to when to take the triptan or the number of triptan doses that can be taken.

Patients' perception of the triptan education they received at the time of prescription revealed that the majority of subjects recalled having received education in all of the topics queried, with the exception that slightly less than 50% recalled having received education regarding medical contraindications (Table 3).

Comparisons of patients' perceptions of education received to their actual knowledge regarding timing of triptan administration are shown in Figure 2. Amongst patients who recalled having received education about when to take the triptan during the course of a headache, the majority answered all questions correctly.

In comparison, amongst patients who did not recall having received education about when to take the triptan during the course of a headache, most correctly answered that it is best to take the triptan immediately after a headache begins. However, subsequent results were conflicting because half of subjects incorrectly thought that it is best to wait and take the triptan once headache pain is moderate or severe rather than mild, and the majority incorrectly thought that it is best to take the triptan only if OTC medications have failed.

Comparing subjects who recalled having received education about when to take the triptan during the course of a headache to those who did not receive such education, there were significant differences in actual knowledge for taking the triptan immediately after a headache begins (91% vs. 77%, $p=.049$; CI: .00-.33), treating when pain is mild (75% vs. 50%, $p=.009$; CI: .04-.45), and not needing to fail treatment with OTC medications before taking a triptan (74% vs. 42%, $p=.001$; CI: .11-.51).

Comparisons of patients' perceptions of education received to their actual knowledge regarding contraindications to taking triptans are shown in Figure 3. Amongst both groups of patients who either did or did not recall having received education about medical reasons not to take the triptans, only slightly more than half in both groups correctly knew that typical migraine aura is not a contraindication to triptan use. Similar trends with more pronounced differences were seen amongst both of these groups in that the majority of subjects incorrectly recognized that coronary artery disease is a contraindication to triptan use, and incorrectly thought that depression was a contraindication in triptan use. Comparing subjects who recalled having received education about medical contraindications to triptan use to those who did not receive such education, there was a significant difference only in actual knowledge for recognizing that people with coronary artery disease should not take triptans (40% vs. 19%, $p=.001$; CI: .09-.34), although knowledge on contraindications was still lacking overall in both groups.

Comparisons of patients' perceptions of education received to their actual knowledge regarding number of triptan doses allowed are shown in Figure 4. Regardless of whether the subjects were grouped into those that recalled having received this education or not, the majority in both groups answered all actual knowledge questions on these topics correctly. There were no significant differences in actual knowledge between these two groups.

Comparisons of patients' perceptions of education received to their actual knowledge regarding taking other medications with the triptan are shown in Figure 5. Amongst subjects who either did or did not recall having received education about this topic, most subjects in

both groups answered all questions correctly with the exception that the majority of those having received education, and half of those who did not recall education, incorrectly thought that once a triptan is taken, OTC medications cannot be taken. There were no significant differences in actual knowledge between these groups.

Discussion

Patient education on how and when to take a triptan, contraindications to triptan use, and using other treatments with the triptans are felt to be important for successful and safe migraine treatment. Studies have evaluated factors associated with triptan use such as social demographics, age, gender, Migraine Disability Assessment (MIDAS) scores, headache frequency, cutaneous allodynia, depression, education levels, household income, health insurance, and preventive medicine use.^{35, 36} Clinician-patient communication is felt to be integral to improving treatment outcomes in not only migraine, but across the wide spectrum of the medical profession.^{14, 15, 23-3333} Cady et al showed that nurse-based education in the office directly and significantly correlated with increased patient knowledge regarding migraine and its treatment, including recognizing the importance of treating early before the pain becomes moderate or severe.²⁶ Rothrock et al showed that patients receiving intensive education had a significant reduction in MIDAS scores, mean headache days, incapacitating headache days, less analgesic overuse, were more compliant with medication use and showed a reduction in utilization of healthcare resources.²⁸ In comparison to these studies, our study focused on determining the recall and content of triptan education that patients received during their office visit, comparisons of patients' actual and self-perceived knowledge regarding the triptans, and the association between receiving education and actually being knowledgeable about the triptans. Results of our study are consistent with other studies in regards to not only the importance of patient education in triptan use and adherence^{25-28,35}, but also the importance of patient education in terms of improving actual patient knowledge regarding optimal triptan use and contraindications to ensure safe and effective use.

Patient's actual knowledge about the triptans varied widely according to the specific area of knowledge being tested. This was likely related to the content and extent of education received, but may also relate to differences in the type of education received, and the character and manner that the education was given, which were not characterized in this study. Patients were more knowledgeable about the timing of triptan administration and the number of triptan doses that can be taken, but less knowledgeable about taking other medications with their triptan and contraindications to the triptans. These results suggest that many patients are not adequately knowledgeable about combining triptans with OTC pain medications such as NSAIDs, a treatment practice that is often employed.

There were no significant differences in actual knowledge between subjects receiving education vs. those not receiving education regarding number of triptan doses allowed for a headache. However, there were significant differences in actual knowledge regarding when to take the triptan between subjects who reported that they received this education vs. subjects who did not receive such education. Specifically, statistical analysis confirmed that educated subjects knew that it is best to take the triptan immediately after a headache begins,

when pain is mild, and that they do not need to fail treatment with OTC medications before taking a triptan. These data confirm the crucial role of education in teaching patients when to take the triptan during the course of a headache.

Comparison of patients' perception of education received to their actual knowledge regarding taking other medications with their triptan revealed no differences in actual knowledge between those subjects reporting that they received such education and those who did not receive the education. However, knowledge regarding taking other medications with a triptan was relatively low in both groups. The greatest lack of knowledge was for recognizing the allowance of taking OTC pain medications once a triptan had been taken; the majority of patients answered this question incorrectly.

The comparison of patients' perception of knowledge to their actual knowledge regarding triptans showed no significant differences in actual knowledge between subjects who report that it is complicated to understand how and when to take the triptan compared to those who did not think it is complicated. Thus, clinicians must be cautious with drawing conclusions about how much a patient actually knows about their triptan simply based upon a patient's self-perception of knowledge.

The appropriate use of triptans for treatment of migraine with aura attacks may need to be discussed in greater detail with migraine with aura patients, as well as patients with depression based on results of actual patient knowledge. These two factors were incorrectly identified as contraindications to triptan use in a large portion of subjects. Although the reasons that subjects thought triptans should not be taken by people with depression were not explored further, since depression is commonly encountered amongst our migraine patients, discussion of the use of triptans in the presence of depression may need to be discussed in greater detail with our migraine patients.

A large majority of subjects did not know that people with coronary artery disease should not take triptans. Although we did not specifically assess for the presence of coronary artery disease in our sample, the prevalence of coronary artery disease in young group of people taking triptans is presumably very low. Nevertheless, given the potential for significant adverse effects of triptan use in patients with coronary artery disease, knowledge about avoiding triptan use if coronary artery disease develops should be more highly represented in a sample of patients using triptans.

Comparison of patients' who reported having received vs. not received education compared to their actual knowledge regarding medical reasons not to take triptans showed that actual knowledge regarding contraindications was poor in both groups. The majority of patients, whether or not they were educated about medical reasons to not take triptans, did not recognize that coronary artery disease is a contraindication to triptan use and thought that depression is a contraindication, while almost half thought that triptans could not be taken for treatment of migraine with aura. However, those who had received education were more likely to have the knowledge that coronary artery disease is a contraindication to the use of triptans compared to those who had not been educated. These findings suggest that

education on medical reasons not to take triptans does improve medical knowledge, but clearly more intensive education on these topics is necessary.

Study Limitations

There are a wide range of measures of education process and outcome. These measures may be self-reporting or objective, but both have been shown to be clinically important and both have shown predictive validity.^{14, 37-41} Regardless, there are limitations to this study's analyses that should be considered when interpreting results. First, although subject recruitment was prospective and assessment of patient knowledge regarding the triptans was prospectively collected, subjects had to recall the education that they received about the triptan. Recall bias and limitations in recall are thus inherent limitations. Also, the lack of piloting items and questions prior to their use in the study is an additional limitation. Future studies should prospectively collect objective data on triptan education, rather than retrospective and subjectively based on patient perceptions of education that they received.

Patient functional status and level of education were not factored into the study, but are characteristics that could contribute to limitations in recall, retention of education received at the time of triptan prescription, and perhaps willingness to participate in the study. It is important to note that patient education is not purely examined in this study; rather, patients' perception of received education about triptans serves as the dependent variable. Further, patient knowledge, rather than successful use of triptans, is the independent variable. Although the questions refer to the education delivered at the time of the original prescription, patients might have had a difficult time differentiating the education that they received at the time of the original triptan prescription from education that they received at other times.

Another limitation is the role of patient-specific education in the study results. Physicians often provide specific education about a drug when it is relevant to a patient. For example, healthy young patients likely have little need to know about cardiac contraindications. Therefore, they may not have received education on this, and their lack of knowledge regarding this topic may be reflective of that. Future studies evaluating specified age ranges, and formulating knowledge questions that are relevant to those specified age ranges, would help to eliminate this limitation.

The format of delivering triptan education was also not well defined. Knowing the type of education that patients received when the triptan was prescribed (e.g. verbal education, written education, or both) would be helpful for evaluating methods of education delivery that optimize actual patient knowledge.

Patients were mostly white and female, so the limitation of generalizability also becomes an issue. Furthermore, the study included both episodic and chronic migraine patients and this may impact the results, as decisions of triptan use in chronic migraine are considerably more complicated than decisions in episodic migraine. Therefore, future studies addressing these topics should evaluate episodic and chronic migraine patients in separate but comparable groups. Lastly, the number of patients who reported receiving no education was rather small

and therefore confidence intervals around the point estimates for those groups becomes much wider.

Conclusions

Successful and safe treatment of migraine with triptans requires proper patient education, not only by headache specialists, but also by primary care physicians who are often the initial triptan prescribers. This study provides evidence that education about the triptans improves patient knowledge on how to optimize triptan use. Findings revealed that triptan users who received education were significantly more knowledgeable about the importance of taking the triptan immediately after a headache begins, treating when pain is mild, not needing to fail treatment with OTC medications before taking a triptan, and understanding that coronary artery disease is a contraindication to triptan use. Study results suggested that patients either did not receive or did not recall receiving education on taking other medications with a triptan, limits on the number of triptan doses that can be taken each week/month, triptan side effects, and contraindications to triptan use. Future studies with larger populations evaluating the effect of triptan education would be useful to confirm these findings and to evaluate the utility of different formats of patient education for improving patients' actual knowledge.

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Figure 1.

Does Patient Perception of Knowledge Match Their Actual Knowledge?

Figure 2.

Does Patient Perception of Education Received Match Their Actual Knowledge Regarding Timing of Triptan Administration?

Figure 3.
Does Patient Perception of Education Received Match Their Actual Knowledge Regarding Contraindications to Triptans?

Figure 4.
Does Patient Perception of Education Received Match Their Actual Knowledge Regarding the Number of Triptan Doses that can be Taken?

Figure 5.
Does Patient Perception of Education Received Match Their Actual Knowledge Regarding the Use of Other Medications with the Triptans?

Table 1
Patients' self-perception of their triptan knowledge

	Agreed	Disagreed
It is complicated to understand how and when to take the triptan	32/207 (15.5%)	158/207 (76.3%)
I am educated about my triptan.	180/206 (87.4%)	7/206 (3.4%)
I am aware of the side effects associated with my triptan.	145/207 (70%)	28/207 (13.5%)

Numbers do not add to 100% since some subjects neither agreed or disagreed with the statement

Table 2
Patients' actual knowledge about the triptans

	Agreed	Disagreed
Timing of Triptan Administration		
It is best to take the triptan immediately after a headache begins.	184/207 (88.9%)	<i>23/207 (11.1%)</i>
It is best to take the triptan once headache pain is moderate or severe.	<i>59/207 (28.5%)</i>	148/207 (71.5%)
It is best to take the triptan only if over-the-counter medications have failed to adequately treat the headache.	<i>63/207 (30.4%)</i>	144/207 (69.6%)
Triptan Dosing		
If my headache does not respond to one dose of the triptan, a second dose can be taken.	179/207 (86.5%)	<i>28/207 (13.5%)</i>
The triptan can be taken every hour until the headache resolves.	<i>13/207 (6.3%)</i>	194/207 (93.7%)
Only 1 dose of a triptan is allowed each day.	<i>38/207 (18.4%)</i>	169/207 (81.6%)
Other Medications		
Once I have taken a triptan, I should not take over-the-counter pain medications to treat the same headache.	<i>114/207 (55.1%)</i>	93/207 (44.9%)
Patients taking migraine preventative (prophylactic) medications do not need prescription abortive medications (e.g. triptans).	<i>45/207 (21.7%)</i>	162/207 (78.3%)
Contraindications		
Triptans should not be taken if the migraine headache is preceded by a typical aura.	<i>100/207 (48.3%)</i>	107/207 (51.7%)
People with coronary artery disease should not take triptans.	61/206 (29.6%)	<i>145/206 (70.4%)</i>
People with depression should not take triptans.	<i>125/206 (60.7%)</i>	81/206 (39.3%)

Bold: "Correct" responses.

Italics: Also includes patients who neither agreed nor disagreed.

Table 3
Patients' perception of the education that they received regarding the triptan at the time it was prescribed

When I was prescribed the triptan I was educated about:		
	Agreed	Disagreed
How to decide if I should take the triptan.	168/207 (81.2%)	39/207 (18.8%)
When to take the triptan during the course of a headache.	181/207 (87.4%)	26/207 (12.6%)
Possible side effects from the triptan.	148/207 (71.5%)	59/207 (28.5%)
Medical reasons that one shouldn't take the triptan.	102/207 (49.3%)	105/207 (50.7%)
The number of doses that I could take for a headache.	181/207 (87.4%)	26/207 (12.6%)
Taking other medications with the triptan.	132/206 (64.1%)	74/206 (35.9%)
How many doses I could take each week/month.	133/207 (64.3%)	74/207 (35.7%)

Italics: Also includes patients who neither agreed nor disagreed.