Original Article

Parental Satisfaction With Sumatriptan Nasal Spray in Childhood Migraine

Ann Pakalnis, MD; Donna Kring, RN, MSN, CPNP; Juliann Paolicchi, MD

ABSTRACT

Migraine headaches are a frequently encountered neurologic problem in children. The utility of the triptans has not been as clearly documented in this population, although it is well delineated in acute migraine attacks in adults. We conducted a retrospective chart review of our experience with using sumatriptan nasal spray in children aged 5 to 12 years from our headache clinic population with migraine headaches. The nasal spray formulation is used frequently in our clinic population with patients who have failed over-the-counter therapy with ibuprofen or acetaminophen. None of the triptans are approved by the US Food and Drug Administration for use in children or adolescents (12 years and older). One hundred of these patients were identified, and their parents or guardians completed a standardized questionnaire regarding their child's response to sumatriptan nasal spray in acute migraine. Fifty-seven of 100 families completed the questionnaire, and 44 of 57 families (77%) reported good to excellent relief of their child's migraine attacks with sumatriptan nasal spray. In our cohort of pediatric patients, sumatriptan nasal spray was effective and well tolerated when used for abortive therapy of acute migraine attacks. (*J Child Neurol* 2003;18:772–775).

Migraine headaches in children are a common occurrence, with prevalence rates ranging from 3.2 to 10.5%.[1] Migraines in children can have a significant impact on education and social development because of school absences and inhibition of outside activities. In addition, parental stress and missed work in caring for children with migraines are issues. Development of safe and effective treatment is needed in children. Treatment of migraine in adults has been revolutionized in the past 10 years with the addition of the triptans, serotonin agonists that display effectiveness in treatment of the migraine symptom complex with generally few significant side effects.[2] None of these medications are currently approved for use in children, although a few studies have been done with these medications, almost all in the adolescent population.[3,4]

The triptans, as a class of medications, are an effective abortive treatment in adult migraine. In the United States, the Food and Drug Administration has approved seven triptans at this time.[5] Sumatriptan (Imitrex) is the medication with longest history of FDA-approved use in this group and has been well studied in adults. It is available in several dosage preparations, including an oral tablet, a nasal spray, and an injectable form. Therapeutic response and tolerability in children have not been well studied. Previous published reports have studied the sumatriptan nasal spray in adolescents, smaller patient groups, or nonintermediate range doses (5 mg and 20 mg prescription strength).[6,7]

Currently, the mainstays of abortive therapy for treating pediatric migraine attacks have been over-the-counter oral analgesics such as acetaminophen and ibuprofen. They can be effective in some children but have limited utility in children, with significant nausea and vomiting accompanying their headaches with inhibition of oral absorption. They have nonspecific mechanisms of action, providing some degree of analgesia but not affecting the other migraine constellation of symptoms such as photophobia, phonophobia, or nausea, which can each be very debilitating for the headache patient.

Received March 25, 2003. Received revised May 16, 2003. Accepted for publication May 19, 2003.

From the Departments of Neurology and Pediatrics (Drs Pakalnis and Paolicchi), Ohio State University College of Medicine, Columbus, OH; and Section of Neurology (Drs Pakalnis and Paolicchi and Ms Kring), Children's Hospital, Columbus, OH.

Supported in part by a research grant from GlaxoSmithKline.

Presented in abstract form at the Child Neurology Society Annual Meeting, Washington, DC, October 2002.

Address correspondence to Dr Ann Pakalnis, Section of Neurology, Children's Hospital, 700 Children's Drive, Columbus, OH 43205. Tel: 614-722-4605; fax: 614-722-4670; e-mail: pakalnisa@pediatrics.ohio-state.edu.

Table 1. Sumatriptan (Imitrex) Questionnaire

1. What date was your child started on Imitrex nasal spray? _____
2. How many migraine headaches has your child treated with Imitrex nasal spray?
   (Please circle) 0 1–2 3–4 5 or more
3. Are you using the Imitrex nasal spray now?
   (Please circle) Yes No
   If no, why? _____
4. How well does the Imitrex nasal spray relieve your child's headaches?
   (Up to 24 hours after the first dose)

Not at All	Somewhat Helpful	Generally Helpful	Good Relief	Excellent Relief Stops Headache
0	1	2	3	4

5. Does your child have any unwanted symptoms you associate with Imitrex nasal spray?
   0 = None
   1 = Rarely (mild)
   Please list: _____
   2 = Moderate (not bothersome)
   Please list: _____
   3 = Significant
   Please list: _____
   4 = Severe (the medication was stopped owing to side effect)
   Please list: _____
6. How easy/convenient is the medication to use?
   0 = Not a problem
   1 = Mild inconvenience
   2 = Somewhat bothersome/inconvenient
   3 = Have problems using most of the time
   4 = Stopped the medication owing to administration methods
7. Your doctor has discussed with you that the Imitrex nasal spray is "off label" for use in children and approved at this time by the US Food and Drug Administration only for use in adults, 18 years of age and older. Do you have any concerns regarding this?
   0 = Not at all
   1 = A little concern
   2 = Moderate concern
   3 = A definite worry
   4 = Choose not to take medication owing to this
   If 1–4, please explain: _____
8. How often does your child have his/her migraine headaches?
   _____
9. Is your child taking a preventive medicine for their migraines?
   (Please circle) Yes No
   If yes, which one(s)? _____

To address the question of pediatric therapeutic response and tolerability of sumatriptan nasal spray, we conducted a retrospective chart review of migraine patients, from our headache clinic, aged 5 to 12 years who were treated with a standardized dosing regimen of sumatriptan nasal spray. Parental satisfaction with sumatriptan nasal spray was assessed by patient or guardian report via a written standardized questionnaire.

MATERIALS AND METHODS

An 18-month retrospective chart review from January 2001 until July 2002 was completed on patients between the ages of 5 and 12 years who were evaluated in the Headache Clinic at Children's Hospital, Columbus, Ohio. A database of all headache patients was used to identify those patients who were previously prescribed sumatriptan nasal spray as an abortive treatment for their migraine (with or without aura who also met age requirements). All patients met International Headache Society criteria for diagnosis of pediatric migraine with or without aura.[8] A total of 100 patients were identified after this data search as meeting these qualifications. Sumatriptan nasal spray is routinely dosed in our migraine patients as follows: 5 mg for patients weighing less than 25 kg, 10 mg (two sprays of the 5 mg spray) for patients 25 to 50 kg, and 20 mg sumatriptan nasal spray for patients weighing more than 50 kg. Patients are instructed to repeat the dose as needed after 2 or more hours for persistent migraine, with a maximum of two doses to be used in 24 hours and not less than 2 hours apart. Instructions for dosing the medication are standardized and given by one of the authors (A.P. or D.K.).

A nine-item questionnaire was developed to query the parents or guardians on treatment history with sumatriptan nasal spray, headache response to sumatriptan nasal spray, parental concerns regarding off-label use of the medication, and convenience of the medication (Table 1). A brief history regarding the frequency of migraine attacks and whether prophylactic medication was being used was also included. Approval for this study was obtained from our institution's Human Subjects Investigation Review Board.

Questionnaires were presented to the parents or guardians of 100 patients identified retrospectively as meeting age criteria and treating at least one migraine headache with sumatriptan nasal

Table 2. Patients Treated With Sumatriptan Nasal Spray

Parent Responses Tabulated	*n*	*%*
How many migraines treated		
1–2	12	21.1
3–4	13	22.8
5 or more	32	56.1
Using spray now		
Yes	42	73.7
No	15	26.3
How well does it relieve		
Not at all	2	3.5
Somewhat	1	1.8
Helpful	10	17.5
Good	17	29.8
Excellent	27	47.4
Unwanted symptoms		
None	25	43.9
Rarely	9	15.8
Moderate	10	17.5
Significant	11	19.3
Severe	2	3.5
Convenient to use		
Not a problem	49	86.0
Mild	4	7.0
Somewhat	2	3.5
Stopped using	2	3.5
Concerns about "off-label" use		
Not a problem	32	56.1
Mild	12	21.1
Somewhat	8	14.0
Problems	5	8.8

spray. The majority of the identified patients' parents or guardians were mailed questionnaires. Parents who did not return the questionnaires by mail were contacted by telephone or asked to complete the questionnaire at a subsequent clinic visit. A small number of patients received the questionnaire for the first time at one of their follow-up visits if we did not have current mailing information. Fifty-seven responses of 100 patients meeting criteria were obtained. Forty-one families did not complete and return questionnaires; the majority of failed responses was related to lack of a current address, a disconnected telephone, or telephone messages not returned. Two families were contacted by telephone and declined to participate owing to time constraints.

RESULTS

Fifty-seven of 100 (57%) questionnaires were completed (Table 2). Fisher's exact test was used for statistical analysis of the data obtained. Thirty-two children (56%) were boys; the 15th percentile for age was 6.2 years, and the 85th percentile for age at drug initiation was 11.1 years, with a median age of 8.9 years. Our patients' families are asked to keep headache diaries, and frequencies are extrapolated from this information. Boys averaged slightly more headaches per month than girls (mean 3.5 ± 3.4 SD versus mean 1.98 ± 1.8 SD; P = .03). Forty-four of 57 families (77%) reported good to excellent headache relief of their child's migraine attacks, with 93% of those families reporting continuing use of the sumatriptan nasal spray. There was no differential response to patient gender and headache relief with sumatriptan nasal spray ($P = .54$) or number of headaches per month ($P = .90$).

Thirty-one of 57 patients (54%) were taking a prophylactic medication for their migraines while using the sumatriptan nasal spray. There was no significant difference between the response to sumatriptan nasal spray and use of preventive migraine therapy ($P = .23$). Preventive medications used by our patients include cyproheptadine (2), topiramate (6), gabapentin (1), divalproex sodium (1), sertraline (1), and amitriptyline (20).

Significant side effects were reported in 13 patients; bad taste (in 13 patients) and dizziness (in 4 of 13 patients) were predominantly noted. Five patients discontinued the sumatriptan nasal spray owing to side effects, namely bad taste. Two patients discontinued the medication related to difficulty in using the sumatriptan nasal spray. Five parents or guardians of the patients reported significant concerns regarding off-label use, but none of these families discontinued the medication.

DISCUSSION

Sumatriptan nasal spray was effective and well tolerated in our series of pediatric patients from 5 to 12 years of age when used in abortive treatment of their migraine attacks. We used a standardized dosing regimen in our headache clinic to optimize treatment while minimizing side effects in children of varying sizes, ranging from 5 years of age to early adolescence. The medication was well tolerated; bad taste was the most common side effect, with a few patients discontinuing the medication related to side effects. The medication was relatively easy to administer, and only two patients stopped the medication related to difficulty in using the nasal spray.

The ability to use triptans administered as nasal spray has distinct advantages in the pediatric population. Often their headaches are shorter in duration than in adults, with more occurrence of significant nausea and vomiting, which effectively precludes oral administration of medication. Furthermore, the rapid onset of action for the nasal spray has distinct advantages in children. An earlier study has suggested that oral sumatriptan is less efficacious in childhood migraine, possibly on a pharmacokinetic or pharmacodynamic basis.[9] In this population, injectable forms of medication are impractical for obvious reasons.

We found that nearly 75% of the patients reported ongoing use of the sumatriptan nasal spray and that the parents or guardians were generally not concerned by off-label use in this age group. It is interesting to note that the children in this study were treatment failures with over-the-counter medications such as acetaminophen and ibuprofen.[10] This could explain some of the caregivers' acceptance of a medication used off label. In addition, many of these patients had more frequent or severe migraine attacks because over half of the patients were prescribed prophylactic medication in addition to abortive therapy for their headaches.

Our results show that the sumatriptan nasal spray was well received by parents when prescribed chronically for treatment of their child's acute migraine attacks. It is an acceptable treatment option for children who do not respond to over-the-counter analgesics. The medication had minimal side effects in patients who had proven refractory to over-the-counter medications. Our study information is consistent with an earlier study of sumatriptan nasal spray in 10 children aged 5 to 12 years.[6] Together our studies serve as a body of preliminary data suggesting that sumatriptan nasal spray in doses adjusted for physical size is well tolerated and effective in young children. We recognize that a retrospective study can be prone to selection bias; however, a prospective, randomized trial might verify our observations.

Acknowledgments

We appreciate the assistance of John Hayes, PhD, who performed the statistical analysis, and Ms Abby Bratton, who prepared the manuscript.

References

1. Abu-Arafeh I, Russel G: Prevalence of headache and migraine in school children. *BMJ* 1994;309:765–769.
2. Brown EG, Endersby CA, Smith RN, Talbot JCC: The safety and tolerability of sumatriptan: An overview. *Eur Neurol* 1991; 31:339–344.
3. Ueberall MA, Wenzel D: Intranasal sumatriptan for the acute treatment of migraine in children. *Neurology* 1999;52:1507–1510.
4. Rothner AD, Winner P, Nett R, et al: One-year tolerability and efficacy of sumatriptan nasal spray in adolescents with migraine: Results of a multicenter open-label study. *Clin Ther* 2000; 22:1533–1546.
5. Tepper SJ: Safety and rational use of the triptans, in Mathew N (ed): *"Headache" in The Medical Clinics of North America.* Philadelphia, WB Saunders, 2001, 959–970.
6. Hershey AD, Powers SW, LeCates S, Bentti AL: Effectiveness of nasal sumatriptan in 5- to 12-year-old children. *Headache* 2001;41:693–697.
7. Winner P, Rothner AD, Saper J, et al: A randomized double-blind, placebo-controlled study of sumatriptan nasal spray in the treatment of acute migraine in adolescents. *Pediatrics* 2000; 106:989–997.
8. Maytal J, Young M, Shechter A, Lipton RB: Pediatric migraine and the International Headache Society (IHS) criteria. *Neurology* 1997;48:602-607.
9. Hamalainen ML, Hoppu K, Santavuori P: Sumatriptan for migraine attacks in children: A randomized placebo-controlled study—Do children with migraine respond to oral sumatriptan differently from adults? *Neurology* 1997;48:1100–1103.
10. Hamalainen ML, Hoppu K, Valkeila E, Santavuori P: Ibuprofen or acetaminophen for the acute treatment of migraine in children: A double-blind, randomized, placebo-controlled, crossover study. *Neurology* 1997;48:103–107.