

Prospective Comparison of Methods for Assessment of Headache Directionality

Carmen Hoffman; Todd Schwedt, Julia Files, Juliana VanderPluym, Thomas Bravo, Puneet Raman
University of Arizona College of Medicine-Phoenix, Arizona; Department of Neurology - Mayo Clinic - Scottsdale, Arizona

Abstract

Response to prophylactic treatment of migraine with Onabotulinumtoxin A (BTX-A) has been noted to be significantly correlated to the perceived direction of headache pain, namely imploding vs. exploding subtype. This study analyzed 3 methods of assessing migraine directionality in comparison to a 30-day headache log; pictorial representation, written description, and physician assessment. Each of these assessment types was shown to have poor agreement with the headache log at the initial visit. However, all 3 assessments displayed excellent agreement at the return visit, as well as significantly improved confidence in patient ability to determine headache directionality.

Introduction

The Global Burden of Disease Survey 2010 ranks migraine as the third most prevalent disorder, as well as the 7th highest specific cause of disability worldwide. Management requires utilization of both prophylactic and abortive therapies. However, individual responses to prophylactic medications are highly variable, and FDA approved migraine prevention treatments were found to be effective in only 200 to 400 patients per 1,000 treated. Currently, there are no known clinical factors that are predictive of patient response, and clinicians must design individual treatments based on trial and error.

Studies of one prophylactic migraine therapy, OnabotulinumtoxinA (BTX-A), have noted that the described direction of headache pain was strongly predictive of patient response to treatment. Specifically, responders were significantly more likely to experience ‘imploding’ headaches, in which their head feels as if it has been “crushed, clamped, or stubbed by external forces”. Non-responders were more likely to experience ‘exploding’ headaches, described as “a painful buildup of pressure inside the head” [3].

Currently, no standardization exists for making this differentiation in headache subtype. The purpose of this study was to investigate different methods of determining headache directionality subtype and compare these with a 30-day headache log.

Materials and Methods

- 34 patients seen at outpatient headache neurology clinic with primary diagnosis of migraine with or without aura as determined by ICHD III beta
- A self-administered survey and Migraine Disability Assessment (MIDAS) questionnaire was completed by the patient, followed by a scripted physician interview
- Headache directionality was assessed using three methods:
 - Pictorial representation
 - Written description
 - Physician question with hand gestures
- Patients then kept a 30-day headache log detailing headache subtype and frequency
- Following completion, patients returned to clinic to complete a follow-up survey and MIDAS questionnaire, and repeat physician assessment
- Inter-rater agreement was determined via Cohen’s kappa coefficient

Results

Age (mean +/- SD)	44 +/- 14 years
Sex	Male = 4 Female = 30
Headache Diagnosis	Chronic Migraine = 27 Episodic Migraine = 7 Medication Overuse = 4
Headache Frequency per 90 days (mean +/- SD)	37 +/- 30
Years with Migraine (mean +/- SD)	19 +/- 14
Highest Education	Some College, No Degree = 10 Associate Degree = 10 Master’s Degree = 9 Professional or Doctoral Degree = 5

Table 1: Subject Demographics and Migraine Characteristics

	Cohen’s Kappa	Cohen’s Kappa
Method	Initial Visit	Return Visit
Pictorial Representation	0.24	0.92
Written Description	0.38	0.84
Physician Assessment	0.46	0.92

Table 2: Cohen’s Kappa values describing inter-rater agreement pre- and post- diary

- Of the 34 patients included in the study, 28 completed the headache diary, with 27 completing follow-up
- All 3 initial assessments displayed poor agreement (Cohen’s kappa values displayed in Table 2) when compared to the 30-day headache log
- All 3 return assessments displayed excellent agreement when compared to the 30-day headache log
- Average confidence scores showed a statistically significant increase for all 3 assessment types following use of headache log

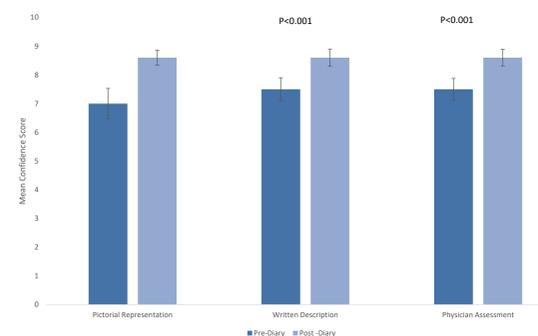


Table 3: Graph depicting confidence scores for each method pre- and post- diary

Discussion and Conclusions

The main finding of this study is that the ability to determine headache directionality improves after patients prospectively maintain a headache diary that includes self-assessment of headache directionality. There was poor agreement between determination of headache directionality via pictorial assessment, written assessment, and physician question prior to prospective diary keeping with actual headache directionality determined during diary maintenance. However, following diary maintenance all three methods of determining headache directionality had excellent agreement with headache directionality per the gold-standard method of prospective ascertainment.

The results from this study do not indicate that one method of determining headache directionality is superior to others. The results do suggest that patients are not familiar with the idea of determining their headache directionality during the initial questioning. However, once the topic of headache directionality is introduced and patients prospectively determine their headache directionality during each headache, all three tested methods of determining headache directionality are highly accurate.

Limitations of this study included the small sample size and loss to follow-up. Furthermore, since patients only maintained a headache diary for 30 days, it is unclear whether this was a true representation of their typical headaches.

Acknowledgements

I wish to thank my mentor Dr. Julia Files as well as the PI on this project, Dr. Todd Schwedt. I would also like to thank Drs. Juliana VanderPluym and Thomas Bravo for their assistance in gathering patient data, as well as MS3 Puneet Raman for assistance with obtaining patient consent and data entry. Thank you to Paul Kang for assistance with statistical analysis.