

A Retrospective Review of Status Migrainosus Treatment in Clinical Practice

William Hoffman¹, Joshua Luster¹, Morgan Jordan²

¹Department of Internal Medicine, Brooke Army Medical Center, 3551 Roger Brooke Road, Fort Sam Houston, TX 78234, USA

²Department of Neurology, Brooke Army Medical Center, 3551 Roger Brooke Road, Fort Sam Houston, TX 78234, USA

Short Commentary

Received date: 29/05/2020
Accepted date: 10/06/2020
Published date: 17/06/2020

*For Correspondence

William Hoffman, Department of Internal Medicine, Brooke Army Medical Center, 3551 Roger Brooke Road, Fort Sam Houston, TX 78234, United States

E-mail: William.r.hoffman43.mil@mail.mil

Keywords: Migraine; Status migrainosus; Prolonged migraine; Treatment; migraine prevention

ABSTRACT

Introduction: Status migrainosus is a heterogeneous condition defined by migraine lasting longer than 72 hours. Treatment in clinical practice is highly varied, speaking to the lack of evidence based guidelines. We conducted a retrospective review to understand how clinicians manage this entity in practice.

Materials and methods: We conducted a retrospective review of patients admitted to Brooke Army Medical Center from October 2013 to December 2018 with the ICD-10 diagnosis of migraine. Status migrainosus was defined by the most recent definition provided by the International Headache Society Classification (ICHD-3) as an unremitting, debilitating migraine attack lasting longer than 72 hours with or without aura.

Results: 317 patients were admitted with the diagnosis of migraine headache and 138 met the inclusion and exclusion criteria. Drug selection was highly variable and nearly all patients received a combination of medications. Most patients received an antiemetic (n=113, 81.9%), a non-steroidal anti-inflammatory drug (NSAID) (n=70, 50.7%), an antihistamine (n=67, 48.6%) and/or an antiepileptic medication (n=65, 47.1%). Interestingly, only a small proportion of patients were given an opioid pain medication (n=22, 15.9%) and/or a benzodiazepine (n=7, 5.1%). A small subset of patients were started on medications commonly considered preventative therapy including tricyclic antidepressants (n=8, 5.8%), calcium channel blockers (n=1, 0.7%) or a beta blockers (n=1, 0.7%).

Conclusions: Status migrainosus treatment is highly variable and further study should be conducted to improve treatment.

INTRODUCTION

Migraine headache is a common condition affecting 12% of the population^[1]. The condition is heterogeneous, lacks a universally effective treatment, and is among the world's leading cause of disability^[2,3]. Status migrainosus (SM) is an unfortunate complication of migraine defined by the International Headache Society (ICHD-3) as migraine lasting >72 hours^[4]. Its prevalence is poorly defined^[5] and is thought to be precipitated by stress, sleep deprivation and menstruation^[6,7]. Treatment strategies are often based on expert opinion and limited evidence is available to guide therapy. Given the lack of evidence based guidelines, management can be variable between providers. To better understand how clinicians are treating this difficult entity in clinical practice, we conducted a retrospective review of therapies used in the treatment of SM in hospitalized patients.

METHODS

We conducted a retrospective review of patients admitted to a large military hospital between October 2013 to December 2018 with the ICD-10 diagnosis of migraine. The medical record of each patient was reviewed by the authors to determine if inclusion/exclusion criteria was met. Status migrainosus was defined by the most recent definition provided by the International Headache Society Classification (ICHD-3) as an unremitting, debilitating migraine attack lasting longer than 72 hours with or without aura.⁴ Patients 18 to 65 years old were included in retrospective review if they met the above definition of SM at time of

admission. Patients (1) diagnosed with another headache subtype (i.e. cluster headache), (2) diagnosed with a headache secondary to a different etiology (i.e. subarachnoid hemorrhage, etc.), or (3) admitted to the hospital for a diagnosis other than migraine were excluded. Patients seen and discharged from the emergency department were excluded from the study.

RESULTS

317 patients were admitted with the diagnosis of headache and 138 met the inclusion and exclusion criteria. Cohort demographic characteristics are described in **Table 1**.

Table 1. Demographics.

Gender and Age	
Males	10.9% (15)
Females	89.1% (123)
18-30	26.1% (36)
31-50	58% (80)
51-65	15.9% (22)
Duration of Migraine Prior to Admission	
≤96 hours	23.2% (32)
97-168 hours	32.6% (45)
169+ hours	44.2% (61)
Admission Length	
≤24 hours	21% (29)
25 hours – 72 hours	49.3% (68)
73 hours – 168 hours	25.4% (35)
169+ hours	4.3% (6)
Neurology Consult	
Yes	87.7% (121)
No	12.3% (17)

There was a vast heterogeneity in migraine treatment as described in **Table 2**. Nearly all patients received medications from multiple drug classes (97.1%, n=134). Most patients received an antiemetic (n=113, 81.9%), a non-steroidal anti-inflammatory drug (NSAID) (n=70, 50.7%), an antihistamine (n=67, 48.6%) and/or an antiepileptic medication (n=65, 47.1%). Half of patients received metoclopramide (n=69, 50%) and a significant proportion of patients received diphenhydramine (n=66, 47.8%) and/or ketorolac (n=48, 34.8%). Interestingly, a smaller proportion of patients were given an opioid pain medication (n=22, 15.9%) and/or a benzodiazepine (n=7, 5.1%). Almost half of patients received magnesium therapy (n=65, 47.1%), with a larger proportion of patients receiving it in the final three years of the review compared to the first two. Interestingly, nearly a third of patients received acetaminophen (n=43, 31.2%) and a small proportion of patients received a medication from the Triptan class, both often considered acute abortive medications. A small subset of patients were started on medications commonly considered preventative, including tricyclic antidepressants (n=8, 5.8), calcium channel blockers (n=1, 0.7%) or a beta blockers (n=1, 0.7%).

Table 2. Medications Used in the Treatment of Status Migrainosus.

Medication	n	%	Medication	n	%	Medication	n	%	Medication	n	%
Antiemetic	113	81.9	NSAID	70	50.7	Antihistamine	67	48.6	Antiepileptic Drug	65	47.1
Metoclopra-mide	69	50	Ketorolac	48	34.8	Diphenhydramine	66	47.8	Valproic Acid	46	33.3
Promethazin-e	40	29	Acetaminophen	43	31.2	Meclizine	1	0.7	Topiramate	23	16.7
Prochlorpera-zine	27	19.6	Ibuprofen	3	2.2	Hydroxyzine	1	0.7	Lacosamide	6	4.3
Ondansetro-n	14	10.1	Naproxen	1	0.7				Gabapentin	1	0.7
			Aspirin	1	0.7				Carbamazepine	1	0.7
			Indomethacin	1	0.7				Zonisamine	1	0.7
									Oxcarbazepine	1	0.7
									Levetiracetam	1	0.7
Glucocortico-ids	52	37.7	Ergot Alkaloids	37	26.8	Neuroleptics	30	21.7	Anesthetics	25	18.1
Dexamethas-one	42	30.4	Dihydroergotamine	37	26.8	Thorazine	23	16.7	Ketamine	25	18.1
Solumedral	9	6.5				Haldol	7	5.1	Intranasal Ket-amine	1	0.7
Prednisone	2	1.4				Quetiapine	1	0.7			

Opioids	22	15.9	Serotonin-Norepinephrine Reuptake Inhibitors	14	10.1	Tricyclic Antidepressants	8	5.8	Benzodiazepines	7	5.1
Hydromorphone	15	10.9	Nortriptyline	12	8.7	Amitriptyline	8	5.8	Diazepam	3	2.2
Morphine	6	4.3	Venlafaxine	2	1.4				Clonazepam	2	1.4
Fentanyl	2	1.4							Lorazepam	2	1.4
Tramadol	1	0.7									
Triptan	7	5.1	Calcium Channel Blockers	1	0.7	Selective Serotonin Reuptake Inhibitor	1	0.7	Other		
Sumatriptan	5	3.6	Verapamil	1	0.7	Sertraline	1	0.7	Magnesium	65	47.1
Zolmitriptan	1	0.7							Botox	2	1.4
Rizatriptan	1	0.7							Caffeine	2	1.4
Beta-Blocker	2	1.4	Muscle Relaxers	1	0.7	Nerve Blocks	8	5.8	Nebulized Lidocaine	2	1.4
Propranolol	2	1.4	Tizanidine	1	0.7	Occipital Nerve Block	5	3.6	Melatonin	1	0.7
						Sphenopalatine nerve block	3	2.2	Riboflavin	1	0.7

DISCUSSION

Status migrainosus is a complex and heterogeneous disease that is difficult to treat. The condition is debilitating and sparse evidence is available to guide treatment. We conducted a retrospective review of all patients admitted to a large military treatment facility with the diagnosis of SM to better understand how clinicians manage this difficult condition in practice.

In our review, treatment of SM was highly varied. Medications from a variety of drug classes were utilized and nearly all patients received a combination. The most common medications in our study are those commonly used in the acute treatment of migraine, including antiemetics (n=113, 81.9%), non-steroidal anti-inflammatory drugs (NSAID) (n=70, 50.7%), and antihistamines (n=67, 48.6%). Though these therapies have been widely shown to be effective in the acute treatment of migraine, their effectiveness in prolonged migraine remains unclear. In the prevention of migraine, therapies are often selected based on a patient's comorbid conditions. For example, a patient with migraine and hypertension may be prescribed a calcium channel blocker. It is possible this concept is extrapolated to patients with SM, which may also increase treatment variability. Further complicating drug selection, medications frequently used in refractory headache is contraindicated in patients with certain comorbid conditions. The heterogeneity in treatment is a reflection of the lacking treatment guidelines. By understanding provider practice patterns for this condition, trends may be identified that can inform hypothesis and further study. Randomized and blinded prospective studies should be conducted to evaluate these treatments in prolonged migraine. The limitations of our study are those common to retrospective review, including a heterogeneous cohort and the assumption of accurate record keeping. Further, we did not assess the effectiveness of any one therapy.

CONCLUSION

Status migrainosus treatment is highly variable and further study should be conducted to compare treatment. Provider practice patterns should be hypotheses generating and inform further prospective study.

Ethics Approval and Consent to Participate: The study was reviewed and approved by the Brooke Army Medical Center Institutional Review Board. Reference number: C.2019.126e.

REFERENCES

1. Lipton RB, et al. Migraine prevalence, disease burden, and the need for preventive therapy. *Neurology*. 2007;68: 343–349.
2. Litwack G. Vitamins and Hormones: Chapter 11: Role of Magnesium, Coenzyme Q10, Riboflavin, and Vitamin B12 in Migraine Prophylaxis. 2004.
3. Shoeibi A, et al. Effectiveness of coenzyme Q10 in prophylactic treatment of migraine headache: an open-label, add-on, controlled trial. *Acta Neurologica Belgica*. 2017;117: 103-109.
4. International Headache Society Classification ICHD-3: Status migrainosus, accessed March 2020.
5. Beltramone M, et al. Status migrainosus and migraine aura status in a French tertiary-care center: An 11-year retrospective analysis. *Cephalalgia*. 2014;34: 633–637.

6. Couch J, et al. Status migrainosus: Causative and therapeutic aspects. *Headache*. 1983;23: 94–101.
7. Tarun S, et al. Episodic status migrainosus: A novel migraine subtype. *Cephalalgia*. 2017;38: 304-311.