

## You're the Flight Surgeon

This article was prepared by Joshua L. Shields, M.D., M.P.H.

You are an Air Force flight surgeon stationed at an Air Combat Command base in the Southeast United States. You are the clinic doctor on a Monday morning after a long 3-d weekend with a waiting room full of sick call patients waiting to be seen. After a couple patients complaining of a variety of maladies, including upper respiratory infections and gastrointestinal distress, you enter the room for your fifth patient of the morning. The first thing you notice as you enter the room is that the light is off and the patient is laying down on the exam table with his arm covering his eyes. On the table is a 26-yr-old senior airman airborne linguist.

As you begin the appointment, the patient states that over the past 24 h he has had a significant headache, describing it as throbbing and pulsating pain particularly on his left side behind his eye. He states that light and noise seem to make the headache worse and that he has had some bouts of nausea but denies any vomiting. As the interview continues, he states that he does not remember any inciting event that led to the headache, but he feels like he had some unusual visual symptoms about 30 min prior to the headache starting. He states that the symptoms are severe enough that he is unable to appreciably function in completing activities of daily living or any of his normal job duties. He also notes that any exertion seems to worsen the overall symptoms. He denies any weakness or other similar neurological symptoms. He has taken some over-the-counter analgesics over the past 24 h but states the medication has not improved the symptoms. He has been trying to increase his fluid intake but has a decreased overall appetite. He states this is the first time he has ever had this type of headache. He also denies any relevant family history. He states that work has been rather stressful lately. He also mentions he has not really paid close attention to his sleep hygiene, diet, or exercise patterns. You complete a full physical exam, including a detailed neurological examination, with the only pertinent positive on the exam being increased pain when a light is shone in his eyes.

### 1. With the available information gathered through the interview and physical exam you are able to diagnose the patient with migraine.

- A. True.
- B. False.

### ANSWER/DISCUSSION

**1. B.** While the patient displays many of the classical signs and symptoms of migraines, including photophobia, phonophobia, an “aura-like” experience, worsening with exertion, and nausea, this is the first reported such headache incident. According to the International Classification of Headache Disorders, migraine by definition is a recurrent disease and, therefore, at least two separate episodes are required before an official diagnosis can be made.<sup>4</sup>

The diagnostic criteria for migraine without aura include at least five episodes that last 4 to 72 h and have at least two of the following symptoms: unilateral location, pulsating quality, moderate or severe intensity, or aggravated by physical activity.<sup>4</sup> In addition, one of the following symptoms must be displayed: nausea, vomiting, photophobia, and phonophobia.<sup>4</sup>

The diagnostic criteria for migraines with aura include two separate episodes with the presence of an aura in conjunction with at least two of the following symptoms: visual symptoms and/or unilateral symptoms lasting between 5–60 min, pulsating quality, aggravated by physical activity, nausea, vomiting, photophobia, or phonophobia.<sup>4</sup> Lastly, the headache must not be attributable to another disorder.<sup>4</sup>

Migraines are a significant cause of disability worldwide. According to the World Health Organization, it is the eighth most significant cause of years lived with disability.<sup>1</sup> It is estimated about 44.5 million Americans have experienced a migraine, with a higher percentage of females affected than males.<sup>6</sup> The total estimated direct costs are more than \$17 billion.<sup>6</sup>

### 2. What is the classification of this type of headache?

- A. Primary headache.
- B. Secondary headache.
- C. Tertiary headache.
- D. Headache not otherwise specified.

### ANSWER/DISCUSSION

**2. A.** While at this time it is not possible to definitively diagnose the patient with migraines, through the history and physical it is possible

DOI: <https://doi.org/10.3357/AMHP.5295.2019>

to determine the patient meets the criteria for a primary headache classification. Primary headache disorders, which include migraine, tension-type, and trigeminal autonomic cephalalgias, are usually recurrent and usually have no associated underlying organic cause.<sup>4</sup> Secondary headaches are usually more severe due to an underlying cause such as subarachnoid hemorrhage or arterial hypertension.<sup>4</sup> A few of the “red flags” indicative of secondary headaches include sudden onset, trauma, neurological symptoms, and onset after 50 yr of age.<sup>4</sup> Those headaches that fall into the secondary headache criteria usually warrant neuroimaging followed by a lumbar puncture.<sup>4</sup>

As the patient states that this is his first time having these types of symptoms, it would be beneficial to get a detailed history into what may have contributed to the development of these symptoms at this time. Important information to obtain includes new or heavy family stressors, work stressors, new medications, new medical diagnoses, and changes in dietary or sleeping habits.<sup>9</sup>

### 3. What would be the next appropriate step in caring for the patient?

- A. Send the patient to get a computed tomography scan and follow up with a spinal tap.
- B. Start an intravenous line and give the patient a 1-L normal saline bolus along with an intravenous antiemetic.
- C. Prescribe the patient a combination analgesic containing caffeine.
- D. Instruct the patient to go home and rest while avoiding noise and light and encourage hydration.

### ANSWER/DISCUSSION

**3. C.** While a definitive diagnosis of migraines cannot yet be made, the algorithms and goals of migraine treatment can be used. The goals for successful treatment include restoring the patient to baseline functional ability, decreasing the symptoms and pain as rapidly as possible, preventing recurrence, optimizing self-care, preventing adverse effects, avoiding intensification of symptoms, and educating the patient.<sup>6</sup>

The recommendations for mild to moderate migraines and “migraine-like” events include nonsteroidal anti-inflammatory drugs or combination analgesics containing caffeine.<sup>6</sup> The patient has noted that he has bouts of nausea without any vomiting; thus, oral medications are a viable option. For moderate to severe migraine events or mild to moderate with poor response to previously mentioned medications, then migraine-specific options such as the triptan class of medications or dihydroergotamine are reasonable choices.<sup>6</sup>

If the patient is not able to tolerate oral medications as a result of nausea and vomiting, then intravenous or other nonoral methods present a viable option for medication administration.<sup>3</sup> Without the presence of any “red flags,” neuroimaging should not be pursued, especially with the relatively moderate symptoms as presented in this case.<sup>3</sup> It could also be strongly beneficial to discuss with the patient lifestyle modifications to help prevent further episodes. Specific lifestyle modification recommendations include practicing good sleep hygiene, routine meal schedules, regular exercise, and stress management.<sup>9</sup>

Given that this is the first such headache, option A may be a reasonable choice. However, in this case the severity of the symptoms did not rise to a level where such measures are warranted. However, a strong

case, particularly from an aeromedical standpoint, could be presented that at least imaging would be useful to exclude other possible diagnoses and reduce the aeromedical risk of granting a flying waiver.

### 4. What is the correct aeromedical disposition for the patient?

- A. Take the patient off flying status until fully recovered from the headache, after which return to normal flying duties; no waiver is required.
- B. The patient is disqualified from flying duties and will require a waiver to be returned to flying status.
- C. The patient has not been diagnosed with migraines; thus, no specific change to flying status is required.
- D. The patient will require a flying waiver, but can be returned to flying duties once the current symptoms resolve.

### ANSWER/DISCUSSION

**4. B.** According to the U.S. Air Force Medical Standards Directory, “a single incapacitating headache of any type” is disqualifying.\* While there can be discussion on what exactly qualifies as an “incapacitating event,” in this circumstance the airman was unable to perform his job or flight duties. Furthermore, the headache episode required that he avoid light and noise, and he had many symptoms similar to a migraine, which raises the concern and possibility of a recurrence. Thus, with these concerns in conjunction with the guidelines in the Medical Standards Directory, the best path forward in this case is to consider the airman as disqualified from flying, which will require a waiver approval before he can be returned to flying status.

According the U.S. Air Force Waiver Guide, a minimum observation period is not required.<sup>5</sup> A waiver by the waiver authority can be considered in cases where there are three or fewer headaches per year, no associated neurological dysfunction, mild to no functional impairment, and no prescriptive prophylactic or abortive medicine needed.<sup>5</sup> Any cases that exceed these guidelines will require an evaluation and/or review by the Aerospace Consultation Service.<sup>5</sup> The initial waiver must include a detailed history of the headaches, discussing frequency, intensity, and duration of attacks, as well as associated symptoms, precipitating and relieving factors, lifestyle factors, and environmental factors and their potential contribution.<sup>5</sup> Furthermore, a waiver requires a full physical exam including a complete neurological exam, any labs or imaging studies obtained, along with any specialty consults obtained as necessary.<sup>5</sup> A waiver renewal needs to include an interval timeline and history since the last waiver, all pertinent labs and images obtained, and a current physical with neurological exam.<sup>5</sup> An Aeromedical Information Management Waiver Tracking System review in 2017 showed 2269 submissions that included the diagnosis of headache, of which there were 1177 disqualifications.<sup>5</sup>

The U.S. Navy also considers headaches disqualifying, particularly any that meet the following criteria: prohibits performance of required

\* U.S. Air Force. Section L: neurologic USAF medical standards, L21. In: Medical standards directory (MSD). 2018:44. [Accessed 1 Oct. 2018]. Available from <https://kx2.afms.mil/kj/kx4/FlightMedicine/Documents/Forms/ShowFolders.aspx?RootFolder=%2Fkj%2Fkx4%2FFlightMedicine%2FDocuments%2FMedical%20Standards%20Directory%20%28MSD%29&FolderCTID=0x0120004DEB19A0C597EF4794DF99094B5AD8FC&View=%2FBE6B00DAE%2DE012%2D41B4%2DB351%2DDE160D7DA68D%7D> to those with access.

activities, member sought acute care, causes neurological dysfunction, or requires medication above simple analgesics.<sup>7</sup> Migraines with aura and scotoma are considered not waivable.<sup>7</sup> Waiver consideration factors include frequency, predictability, severity, history of incapacitation, treatment required, type of aircraft, flight hours, experience, diagnosis, and the flight class of the aviator.<sup>7</sup>

The U.S. Army considers migraines disqualifying, while headaches may also be disqualifying, depending on whether or not the headaches are primary or secondary to an underlying condition and if the headaches pose a risk to flight safety.<sup>8</sup> Waiver consideration requires a neurology consult, an aeromedical summary detailing history, timing, frequency, triggers, medication required, and any imaging required.<sup>8</sup>

The Federal Aviation Administration (FAA) has an algorithm to determine whether aviation medical examiners can issue medical certificates for migraines and chronic headaches.<sup>2</sup> If a candidate meets all the requirements, the aviation medical examiner can issue a medical certificate; otherwise, evaluation by the FAA for a special issuance is required.<sup>2</sup> Ocular and complicated migraines require an FAA decision.<sup>2</sup>

The aeromedical concerns of headaches and the reason a waiver is necessary are an important discussion. The main concern with an incapacitating headache is the potential for recurrence and the negative effects this could present to operational effectiveness and mission safety.<sup>5</sup> This is of particular concern if the headache is incapacitating and/or associated with visual symptoms, vomiting, or vertigo.<sup>5</sup> Single seat operators are of particular concern, but in reality any crewmember affected would be of significant concern.<sup>5</sup> Increasing the difficulty and concern are the inability to precisely predict the onset of headaches and the potential to strike at any time.<sup>5</sup>

After appropriately medically treating the airman, he returns to you in a week. He informs you the symptoms have completely abated and he would like to proceed with the waiver process. After discussion with leadership, since this is the patient's first headache, you decide to observe the patient for 4 mo to see if there is any reoccurrence of the headache. You also discuss with the patient the importance of lifestyle modification, while also paying close attention to sleep, exercise, dietary habits, and life stressors, particularly if another headache occurs.

After the 4 mo, the airman returns for a follow-up and to initiate the initial waiver process. He states over the past 4 mo he has not had any reoccurrence of the headache. He also mentions that he has worked to improve his sleep hygiene, diet, and exercise program. He states that work is still stressful but feels that he is better able to handle the stress. He is eager to return to flight status. He is not taking any medications and his physical exam, including a complete neurological exam, is all within normal limits. The waiver was written and submitted, and

within a few weeks the waiver was approved. The airman was able to return to flight status.

**Shields JL. You're the flight surgeon: potential migraine in an Air Force aviator—to diagnose or not to diagnose. *Aerosp Med Hum Perform*. 2019; 90(5):494–496.**

## ACKNOWLEDGMENTS

The author would like to thank Dr. Roger Hesselbrock, Aerospace Consultation Service neurology consultant, for his professional review of this article. The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the Air Force, the Department of Defense, or the U.S. Government.

## REFERENCES

1. Becker WJ. Acute migraine treatment. *Continuum* (Minneapolis). 2015; 21(4, Headache):953–972.
2. Federal Aviation Administration. Decision considerations – aerospace medical dispositions. Item 46. Neurologic – headaches. In: *Guide for aviation medical examiners*. Washington (DC): Federal Aviation Administration; 2018. [Accessed 1 Oct. 2018]. Available from [https://www.faa.gov/about/office\\_org/headquarters\\_offices/avs/offices/aam/ame/guide/app\\_process/exam\\_tech/item46/amd/ha/](https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/app_process/exam_tech/item46/amd/ha/).
3. Gilmore B, Michael M. Treatment of acute migraine headache. *Am Fam Physician*. 2011; 83(3):271–280.
4. Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3<sup>rd</sup> edition. *Cephalalgia*. 2018; 38(1):1–211.
5. Hesselbrock R, Van Syoc D. Headache (Oct. 17). In: *Air Force waiver guide*. Wright-Patterson AFB (OH): U.S. Air Force School of Aerospace Medicine; 2018:348–356. [Accessed 1 Oct. 2018]. Available from <https://www.wpafb.af.mil/afri/711hwp/USAFSAM/>.
6. Mayans L, Walling A. Acute migraine headache: treatment strategies. *Am Fam Physician*. 2018; 97(4):243–251.
7. Naval Aerospace Medical Institute. 10.5. Headaches and migraine (including headache algorithm). In: *U.S. Navy aeromedical reference and waiver guide*. Pensacola (FL): Naval Aerospace Medical Institute; 2018. [Accessed 1 Oct. 2018]. Available from <https://www.med.navy.mil/sites/nmotic/nami/arwg/Pages/AeromedicalReferenceandWaiverGuide.aspx>.
8. U.S. Army Aeromedical Activity. Headache (ICD9 784.0). Migraine (ICD9 346.9). In: *Flight surgeon's aeromedical checklists*. Aeromedical policy letters. Ft. Rucker (AL): U.S. Army Aeromedical Activity; 2014. [Accessed 1 Oct. 2018]. Available from [http://glwach.amedd.army.mil/victoryclinic/documents/Army\\_APLs\\_28may2014.pdf](http://glwach.amedd.army.mil/victoryclinic/documents/Army_APLs_28may2014.pdf).
9. Varkey E, Cider A, Carlsson J, Linde M. Exercise as migraine prophylaxis: a randomized study using relaxation and topiramate as controls. *Cephalalgia*. 2011; 31(14):1428–1438.

This article was prepared by Jianzhong J. Zhang, M.D., M.S.

You were the flight surgeon on duty when a 36-yr-old airman came in for his postdeployment health assessment. He was a navigator and electronic warfare officer (EWO) with 2600 flying hours and 14 yr of service. He told you that during his first week of the deployment, he was flying as an EWO and his aircraft was called to the crash site of an F-16 in which the pilot was killed. The following month his team was

called to the scene of a cargo plane fatal mishap during takeoff that killed all the aircrew. He described those as the worst days of his life after witnessing the crash sites via video feed. He had no other complaints and appeared fine during the interview. You cleared him and

DOI: <https://doi.org/10.3357/AMHP.5331.2019>