Aerospace Medicine Clinic

Prepared by Race Creeden, M.D., and Sean Haight, M.D., M.P.H.

You're the flight surgeon for a training squadron when a 23-yr-old G1P0 student aviator presents to the flight medicine clinic with a chief complaint of headaches. At a 16-wk routine prenatal exam, she discussed with her obstetrician a recent onset of frequent headaches, each preceded by a "visual change" and lasting about 30 min. The scotoma was described as a horizontal line across her visual fields, which progressed and widened over 10 to 15 min, then dissipated and disappeared. Her only method for relieving her symptoms was sleep. Despite her headache and aura symptoms, she reported being in good health, feeling excited for her pregnancy, and receiving strong support from her husband. She had never experienced migraine headaches prior to becoming pregnant. Her medications included Zofran prn and prenatal vitamins. No significant findings were discovered on physical exam.

1. Which of the following would be a "red flag" and might indicate a more serious condition than a "routine migraine"?

   A. Confusion.
   B. Fever.
   C. Sudden onset.
   D. Worsening with Valsalva.
   E. All of the above.

ANSWER/DISCUSSION

1. E. There are several signs and symptoms that may indicate a space-occupying mass, vascular lesion, infection, metabolic disturbance, or a systemic problem. These are known as danger or red flag signs. These include systemic symptoms such as fever, weight loss, cancer, or immunocompromised state, neurological symptoms such as confusion, papilledema, focal neurological symptoms or signs, or seizures. Other concerning features are new or sudden onset, head trauma, illicit drug use, toxic exposure, worsening with exercise or Valsalva, as well as a known previous headache history with a change in frequency, severity or clinical features.[2]

The patient delivered her child at term via spontaneous vaginal delivery without complications. She returned 8 wk following the delivery for evaluation for a return to flight duty and submission of a waiver for her headaches. During the encounter, she reported that her headache symptoms had returned, but without the presence of a scotoma. She endorsed headaches every other week that were accompanied by mild phonophobia and photophobia, but without aura or scotoma and that would resolve after 30 to 60 min of sleep. She was referred to an aeromedical neurology consultant for a neurology evaluation.

2. The typical progression of migraine headaches through the course of a pregnancy is which of the following?

   A. Improvement of symptoms.
   B. Worsening of symptoms.
   C. No change in symptoms.

ANSWER/DISCUSSION

2. A. Over the course of a pregnancy, 60 to 70% of women report an improvement in migraine symptoms, while 5% describe worsening, and the rest describe no change. It is important to note that this is in women with a known history of migraines, and it is unclear if this is also true of women who experience their first one during pregnancy as in this patient.[7] In addition, the most common time for recurrence of migraines is in the postpartum period, and interestingly breastfeeding does appear to have an effect on headaches, and will be discussed later.[8]

3. Which of the following medications would be contraindicated for migraine relief during pregnancy?

   A. Acetaminophen.
   B. Aspirin.
   C. Ergotamine.
   D. Triptans.
   E. All of the above.

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ANSWER/DISCUSSION

3. C. Ergotamine is absolutely contraindicated in pregnancy, as it can cause prolonged constriction of the uterine vessels and increased myometrial tone, leading to reduced placental blood flow.[6] Acetaminophen is first line treatment during pregnancy and is safe, and NSAIDs are accepted as safe during the second trimester but should be avoided in the third due to possibility of constriction of the ductus arteriosus. Triptans are highly effective in treating migraine headaches, but there is a possibility of vasoconstriction of uteroplacental vessels and increased uterotonic activity, though this is not severe enough for triptans to be contraindicated during pregnancy.[9]

4. What is the overall incidence of headache of any type during pregnancy?

   A. 10%.
   B. 21%.
   C. 36%.
   D. 52%.

ANSWER/DISCUSSION

4. B. About 21% of women will experience at least one headache during their pregnancy, according to one study, though the authors were unable to determine if these were primary headaches (tension, migraine, or cluster), or if they were secondary headaches (preeclampsia, hypertensive urgency).[1] In addition, headaches are most likely to recur during the postpartum period, with 34% reporting return of symptoms during the first week, and 55% noting return within the first month postpartum.[10]

5. What would be the expected effect of breastfeeding on recurring headaches postpartum?

   A. Improvement in headaches.
   B. Worsening of headaches.
   C. No change.
   D. Initial improvement, then gradual worsening.

ANSWER/DISCUSSION

5. A. Breastfeeding naturally suppresses ovarian function through an induced production and circulation of prolactin necessary to sustain breast milk. The suppression of ovarian function may reduce estrogen levels, which in turn may reduce estrogen-mediated effects on migraine headaches. In one study, the prevalence of migraine was 57% lower in women who breastfed as opposed to those who bottle fed.[3] Since breastfeeding may be protective against migraine attack, the absence of attack in postpartum women who are breastfeeding should not be taken as evidence that they are otherwise low risk. Aviators must demonstrate several months of a migraine free state in order to determine if migraines were limited to pregnancy or not. This can present problems for student aviators, both for continued training and promotion, and it is not likely that one would be able to return to flight status in a timely enough manner to both meet the time in training requirement and the necessary professional accomplishments to be competitive for promotion.

The patient mentioned in the vignette above underwent an aviation neurology evaluation, and the consultant recommended that she remain grounded until she had completed breastfeeding and her menstrual cycle had stabilized. However, her commanding officer did not support such a delay in returning to flight due to the expected adverse impact it would have to her military career and she was removed from flight training.

Waiver policies for migraine headaches are similar across service branches but differ in some details. The U.S. Air Force waiver guide states that all headaches, except for occasional tension headaches, are disqualifying for flying duties and any headache is considered disqualifying if any of the following are present:

1) Impairment in social, vocational or academic activities caused by the headache and/or its associated symptoms; or
2) Medication other than over the counter is required for abortive control of the headache; or
3) A prescription for prophylactic medication is required for the headache; or
4) There is an associated neurological dysfunction or deficit including aura, with or without associated headache.

The waiver authority may consider a waiver if there are:

1) Three or fewer disqualifying headaches a year; and
2) There is no associated neurological dysfunction, deficit or aura; and
3) There exists negligible or mild functional impairment, nausea, photophobia, or phonophobia; and
4) No prescription prophylactics or abortive medication is required.

Waivers can be considered for IFC I/IA candidates with secondarily provoked headaches or with primary headaches and a long headache-free period.[5]

The U.S. Navy Aeromedical Reference and Waiver Guide states that the specific diagnostic label of the headache is not the key factor for determining whether it is disqualifying, rather of greater concern is the effect on general performance, special senses, and risk of recurrence. A headache is considered disqualifying if any of the following are met:

1) Prohibits performance of required social, vocational or academic activities; or
2) Member sought Emergency Department, hospital, or acute care; or
3) Neurological dysfunction other than nausea/vomiting or photophobia (especially disturbance of special senses, balance, or motor function); or
4) Requires other than simple analgesics or nonpharmacological methods for control.

If the headache is deemed to be disqualifying, then the following factors are considered for waiver recommendations:

1) Frequency:
   a. Severe headache occurred during flight.
   b. More than three severe headaches per year.
2) Predictability.
3) Severity.
4) History of any incapacitation.
5) Treatment Required:
   a. Nonpharmacological.
   b. PRN abortive therapy.
   c. Prophylactic therapy:
      i. Verapamil daily considered for waiver with restrictions if effective and without side effects on a case-by-case basis.
      ii. Topamax and Inderal are not considered for waiver.
6) Type of aircraft.
7) Flight hours and experience.
8) Specific diagnosis and presentation.
9) Status:
   a. Applicant or designated.
   b. Class I vs. Class II/III.

All waiver applications require neurology consultation.[12]

For U.S. Army personnel this individual would be considered disqualified. For waiver considerations she would need to be symptom-free for 12 mo on no medication. For designated personnel, waivers are considered on a case-by-case basis and the following information is required:

1) Neurology consult.
2) Aeromedical summary listing timing, duration, frequency, triggers and predictability of episodes.
3) Complete physical to rule out secondary causes.
4) Brain imaging as indicated by history or exam.
5) Ophthalmology evaluation in cases of visual disturbance.[11]

According to the Federal Aviation Administration (FAA) Guide for Aviation Medical Examiners (AMEs), migraines are considered disqualifying and reviewed on a case-by-case basis. A Conditions AMEs Can Issue (CACI) worksheet allows the AME to issue a medical certificate to the aviator if specified conditions are met.[4]

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