

Headaches in Pregnancy

The following section is entitled “**Headaches in Pregnancy**”. This section deals with some of the basic concepts important to the diagnosis, management and investigation of headaches during pregnancy. The section begins with a *learner handout* with space for the learner to make their own notes. The *learner handout* is followed by a *teaching script* for the educator. The section then concludes with several cases for discussion and a brief bibliography for this topic.

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Objectives

- Identify unique differential diagnosis of headache in pregnant women
- Recognize clinical features of some usual and unusual causes.
- Management hints.

Overriding Issues

- Pregnant women present to their doctor with headaches more often than nonpregnant women
- Sleep deprivation, stress and hormonal changes probably contribute to increase tendency for headaches.
- There are differences in risks for certain types of headaches in pregnancy.

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Differential Diagnosis of Headache in Pregnancy

- Muscular/tension
- Migraine
- Subarachnoid bleed
- Pseudotumor cerebri
- CNS tumor
- Infectious causes
- Non-CNS causes
- Preeclampsia
- Cerebral vein thrombosis

Tension Headaches

- Tension headaches are common in pregnancy.
- They are associated with fatigue depression and caffeine withdrawal.
- They are best managed with acetaminophen, heat, massage and rest.

Migraine Headaches

- Patients with migraines may have more, less or the same frequency while pregnant!
- If there is a change in pattern, it requires an evaluation.
- The goal of management is preventing headaches.

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Medications

- **Acceptable Risk**
 - acetaminophen; codeine; meperidine; butalbital with acetaminophen
 - amitriptyline; beta-blockers
- **Moderate Risk (less known)**
 - calcium channel blockers
- **High or Highly Unknown Risk**
 - ASA; NSAIDS; sumatriptan; ergots

Preeclampsia

- Preeclampsia is a very important cause of headaches in pregnancy.
- Its “Vascular” headache symptoms may herald the onset of other clinical findings.
- Any pregnant woman with a new headache in the 2nd or 3rd trimester should have this ruled out

Pseudotumor Cerebri

- This is an unusual cause of headache in pregnancy, but it carries a high risk of optic nerve damage.
- It presents with frequent and prolonged headaches and papilledema, usually in the 1st and 2nd trimester.
- Diagnosis and management are identical in pregnant and nonpregnant women.

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Intracerebral Bleeding

- **Arteriovenous malformations and aneurysms may present with headaches during pregnancy (related to increase blood volume).**
- **AVM are associated with a possible risk of rupture intrapartum.**
- **Surgical management is appropriate when indicated even during gestation.**

Infectious Causes of Headache

- **Sinusitis is common in pregnancy especially in the 3rd trimester.**
- **The decision to initiate antibiotics is a clinical one. Selection should be guided by local organism susceptibilities and general need to ensure that the dose is adequate (avoiding quinolones).**

- **Pregnant women are at increase risk of contracting Listeriosis, which may present as meningitis.**
- **Maternal Listeriosis is associated with fetal demise.**
- **Empiric coverage for any meningitis in pregnancy should include Listeriosis.**

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Thrombotic Cerebrovascular Disease

- There is an increased risk of TIA, stroke and cerebral vein thrombosis in pregnancy.
- All can be associated with hypercoagulable states and can occur at any time during gestation.
- Most often, the event in pregnancy is the patient's first.

Cerebral Venous Thrombosis

- The patient with cerebral vein thrombosis is ill and only rarely has focal findings.
- Diagnosis can be difficult - she will often otherwise appear to have aseptic meningitis, but the risks are much higher (seizure; bleeding).
- MRI will confirm the diagnosis and once made her medical management should be aggressive.

Headache in Pregnancy Summary

- Headache is common in pregnancy
- Common etiologies prevail
- Benign conditions often undertreated
- Always consider the unusual
- Don't forget preeclampsia and CVT

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Teaching Script

Pregnant women present with headache to their doctors more often than nonpregnant women. Although the frequency of routine prenatal visits probably partially accounts for increases in patient reporting of headaches, the contribution of such factors as sleep deprivation, stress related to the impending life change that pregnancy represents, and hormonal factors may contribute to a true increase in headache occurrence in individual patients. This talk focuses therefore on the rare causes of headaches that are seen with increased frequency during pregnancy and how to treat headaches in pregnancy.

Overall, the approach to headaches in the pregnant woman is similar to that in the nonpregnant individual. There is no substitute for a careful history of the headaches, which often must be developed over several visits, or for a thorough physical examination. Performing it at the first visit, including fundoscopic evaluation, facilitates the development of an appropriate diagnostic and management strategy.

Tension Headaches

Tension headaches are commonly seen in pregnancy. They have often been present prior to pregnancy, but have been self-medicated before the symptoms became unbearable. Pregnant women hesitate (appropriately) to take any medications and will often present with a tension headache that has evolved into a more dramatic picture suggestive of migraine. Further, the fatigue associated with pregnancy is often a key to their intervention. Most tension headaches are best managed with conservative means such as rest (which may include “prophylactic naps”), acetaminophen, heat, massage, and stress reduction.

Migraine Headaches

Individual patients with migraines may have more, less, or the same frequency of migraines while pregnant. Overall, studies have not shown a consistent effect of pregnancy on the incidence of migraines. Migraines may also present for the first time during pregnancy. Many are triggered by caffeine withdrawal in pregnant women who cease caffeine intake in an effort to avoid exposing their baby to the drug. Making this diagnosis, like any trigger for migraine's identification, is the same as in nonpregnant patients, which is by the patient's history.

The key to managing migraines is early engagement of the patient in the process. Reassurance that the headache is not related to a disease that is dangerous to her or her baby is especially important. The patient must understand that prophylaxis by avoidance of potential trigger factors is the mainstay of treatment. The goal is to avoid the need for acute interventions, whether due to ineffective avoidance or prophylaxis or due to rebound headaches from excessive acute pharmacologic use.

The pharmacologic management of migraine headaches in pregnancy is somewhat limited by the safety profile of the individual medications in terms of their potential fetal effects. Medications with an excellent track record for use in pregnancy include acetaminophen, codeine, meperidine, morphine, butalbital with acetaminophen, amitriptyline, and beta blockers (especially atenolol). Calcium channel blockers have also been used successfully with no evidence of fetal effect, although the experience with these medications is far less extensive than it is for amitriptyline and beta blockers. Medications that probably should be avoided during pregnancy include all products containing aspirin and nonsteroidal anti-inflammatory drugs, sumatriptan (and related compounds) and ergot derivatives.

Preeclampsia

When evaluating the pregnant woman with a headache in the second or third trimester, it should be remembered that preeclampsia can present as headache. The headache associated with preeclampsia is usually migrainous in character in that it tends to be throbbing in quality and can be associated with visual phenomena. This makes sense when one considers the fact that both migraines and preeclamptic headaches are felt to be related to intracerebral vasospasm. Unfortunately, the clinical course of these headaches is quite unpredictable. They can smolder along or progress rapidly to the development of dramatic visual symptoms and cortical blindness as the underlying pathology of preeclampsia evolves. Any patient suspected as having preeclampsia should have a thorough evaluation for its associated signs (e.g., rising blood pressure, edema, papilledema) and laboratory findings (e.g., proteinuria, thrombocytopenia, hepatic transaminase elevations). The management of preeclampsia requires obstetric intervention.

Pseudotumor Cerebri

Pseudotumor cerebri (benign intracranial hypertension) is an unusual cause of headache, but occurs with increased frequency in pregnancy. It usually presents with frequent and prolonged headaches that are retro-orbital in location and often made worse by changes in position. It is not relieved by sleep. Patients with pseudotumor cerebri will usually have a completely normal neurologic examination except for the finding of papilledema on fundoscopic examination. No abnormalities are seen on CT Scan of the head. Diagnosis is confirmed by doing a lumbar puncture and finding an elevated cerebral spinal fluid pressure. Although the headache from pseudotumor cerebri can be extremely debilitating, the greatest risk of pseudotumor cerebri is related to the effect of the increased intracranial pressure on the optic nerve. Sustained increases in intracranial pressure related to pseudotumor cerebri can cause progressive visual field loss. Therefore, patients with pseudotumor cerebri should be followed by an ophthalmologist with regular visual field testing.

Treatment options for pseudotumor cerebri include serial lumbar punctures (to remove cerebral spinal fluid and thereby decrease intracranial pressure) and the use of the carbonic anhydrase inhibitor Diamox which can decrease intracranial pressure in some individuals. In cases where visual field loss progresses despite such interventions, surgical release of the optic nerve sheath may be required to preserve vision.

Cerebrovascular Events

Arterial venous malformation and aneurysms that were previously asymptomatic may present with headache in pregnancy presumably related to the increased blood volume associated with the gravid status. Although aneurysms do not have an increased risk of rupture during pregnancy, labor, and delivery, there is a belief that arterial venous malformations have an increased risk of rupture with active labor. This can be managed by repair of arterial venous malformations prior to pregnancy or avoidance of a prolonged second stage (i.e., the “pushing” stage) through the use of forceps or cesarean section in patients with arteriovenous malformations.

Pregnancy is associated with an increased incidence of transient ischemic attacks and cerebral vascular accidents in just the same way as has been reported with the oral contraceptive pill. Although such events are relatively rare, these diagnoses need to be considered in any pregnant patient with headaches and neurologic findings.

Infectious Causes of Headache

Sinusitis is a common cause of headache in pregnancy, especially in the third trimester as vasomotor symptoms progress. Bacterial causes should be entertained using the same criteria as in nonpregnant patients. In general, antibiotic treatment selections are similar as well, with the exception of the general recommendation that fluoroquinolones be avoided in pregnancy, because of their effects on bone and cartilage development in animal studies. When antibiotics

are used, it is important to use adequate doses to penetrate sinus tissue, keeping in mind the potential for the physiology of pregnancy to alter the pharmacokinetics of many drugs.

Meningitis is no more common in pregnant than in nonpregnant patients. It is mentioned here, though, because of the increased attention that must be paid to identifying any underlying bacterial cause, and particularly to ruling out *Listeria* as a cause. *Listeria*, which in most immunocompetent individuals is a gastrointestinal illness, can present as meningitis in pregnant women. Pregnancy is also one of the best documented risk factors for contracting clinical illness from the organism. Further, infection from *Listeria* carries a well established risk of inciting fetal loss. Empiric antibiotic coverage for any pregnant woman must have activity against this organism.

The Zebras: Cerebral Vein Thrombosis

It is useful to remember that pregnancy is a hypercoagulable state, and no discussion of headache in pregnant patients would be complete without a reminder that many patients with heritable hypercoagulable conditions experience their first thrombotic event during pregnancy. Consequently, while most physicians will never encounter this, cerebral vein thrombosis is a condition that occurs more commonly in pregnant women than in other aspects of the population. Its incidence is estimated to be about 1 in 10,000 deliveries in North America and Europe, usually in otherwise healthy young women. Patients with this condition appear ill and always complain of headache. Cerebrospinal fluid is normal or may be consistent with a picture of aseptic meningitis. The head CT scan is usually normal, but MRI will nearly always provide the definitive diagnosis. The morbidity related to cerebral vein thrombosis can be very high for both mother and developing child, and its management must be aggressive with full anticoagulation. Given its rarity, every pregnant patient with a headache does not need an MRI to rule out cerebral vein thrombosis. On the other hand, the diagnosis should be entertained when she is persistently or progressively ill, and especially when there is some history that raises concern about potential hypercoagulability.

Closing Notes

On a closing note, we always like to emphasize to the learner that when evaluating any patient with headaches in pregnancy, it is important to perform and document a complete neurologic exam at every visit. While common etiologies for headache, as in any symptom, are usually the rule, care must be taken to avoid making unwarranted assumptions in this patient population. Some of the causes of headache outlined here do require aggressive intervention, that when missed can result in substantial morbidity to the woman and her developing child. Therefore, necessary radiologic investigations should not be withheld when indicated in pregnancy.

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Case Discussion

Case #1

36 year old weapons engineer from a local naval base presents at 30 weeks gestation with headaches. Her headaches began 3 days earlier and they have waxed and waned in severity since they began. She states that although she has a previous history of migraines, these headaches are different. She feels them across her entire head and into her neck. They are throbbing at times, and at other times they are a constant ache. They have been associated with some nausea, vomiting and photophobia. She does not have any fever, chills or rigors. Her husband is very concerned because his wife “never complains and never misses a days work” but she has taken two days off work because of this headache. The obstetrician sends the patient to the emergency room for evaluation and you are the receiving doctor.

You review her past medical history and find her to be a very healthy individual. Her usual headache pattern is to get a unilateral throbbing headache after being short of sleep or drinking red wine. These headaches resolve with sleep.

Her family history is unremarkable.

Review of symptoms is remarkable only for mild nasal congestion and mild bilateral ankle edema.

A complete physical exam is totally normal except for the fact that the patient looks uncomfortable. Her HR is 100. Her BP is 110/80. Her temp is 97. Her RR is 16. Her sinuses are non-tender. Her fundi are normal. Her neck is supple but tender. Her neurological exam reveals no deficits.

What are some common causes of headache in pregnancy?

What is your differential diagnosis?

Why is her fundoscopic exam so important?

How would you investigate this patient at this point?

What analgesic can you safely provide this patient while she is pregnant?

Are there any special precautions or techniques to be used to do an LP on a pregnant woman?

Her labs including a CBC, AST, uric acid, urinalysis, electrolytes, BUN and Creatinine are all normal.

A lumbar puncture is done which is completely normal.

The presumed diagnosis is migraine with tension headache. She is given intravenous fluid to hydrate her and administered IM meperidine with phenergan. 1 hour later she feels somewhat better but her headache persists. The obstetrician decides to admit her for pain control, because of the degree of discomfort she is experiencing.

A CT scan of the head without contrast is ordered.

What is the risk of a CT scan of the head to the fetus?

The CT Scan of the head comes back as normal.

The patient continues to require regular narcotics in high doses to control her headaches. You are impressed whenever you round on her that she is in immense discomfort. Discussions with her family and her primary internist reveal no pattern of drug seeking behavior in the past.

You decide to send her for an MRI of the head.

What are the risks of MRI in pregnancy?

Are cerebral aneurysms or arterial venous malformations affected by pregnancy?

The MRI shows a large sagittal sinus venous thrombosis. On subsequent questioning it becomes apparent that this patient has had two aunts with thromboembolic disease in their 40's. Subsequent testing reveals she and several family members have protein S deficiency.

How would you manage this rare problem during the course of her pregnancy?

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Case Discussion

Case #2

A 32-year-old woman with a five year history of difficult to control migraines comes to see you 10 weeks into her first pregnancy. You had previously been managing her migraines with Sumatriptan (Imitrex®) but because of your warnings to her when you prescribed this medication she stopped it the moment she found out she was pregnant. Since that time she has been having between 2-3 migraine headaches a week for which she has not been taking anything. She comes to see you now because she cannot tolerate the frequency of these headaches any longer. She wants to know if there are any alternatives for her to take while she is pregnant. She has previously had a complete neurologic evaluation including an MRI of the head. You repeat a neurologic examination on her today and it is completely normal.

Key Points to Review

- 1. Tension and migraine headaches make up the bulk of headaches seen in pregnancy. Although population based studies do not suggest there is an increased incidence of headaches in pregnancy, there are individual patients who appear to have a worsening headache pattern during their pregnancy that may be related to both hormonal changes and fatigue.***
- 2. Unusual causes of headaches in pregnancy include new presentations of aneurysms or arteriovenous malformations, pseudotumor cerebri, cerebral venous sinus thrombosis and acceleration in growth of a meningioma. Preeclampsia is an important and common cause of headaches after 20 weeks gestation.***
- 3. Agents that can be used for the acute management of headaches in pregnancy include: Meperidine (Demerol), Acetaminophen (Tylenol), Codeine, Compazine, Metoclopramide (Reglan), Fioricet, Esgic, Butalbital and Phrenalin.***

Prophylactic agents for frequent migraine sufferers that can be used in pregnancy include: the beta blockers Pindolol and Atenolol, Amitriptyline (Elavil) and in special circumstances Verapamil.
- 4. Headaches in pregnancy are a marker for relationship strife and evaluation of headache in pregnancy should include questions regarding a woman's safety in her home.***

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