

Chronic headache and migraine in pregnancy

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ABSTRACT

The clinical picture of headaches in pregnancy is a therapeutic challenge through the effects of drugs on the mother and fetus. Headache during pregnancy can be primary or secondary to a severe condition that can endanger the patient's life (stroke, cerebral venous thrombosis, eclampsia, brain tumors, choriocarcinoma, subarachnoid hemorrhage). Differentiating the type of headache requires a series of investigations: electroencephalography, vascular ultrasound, brain MRI and MRI angiography, and contrast ophthalmoscopy. The evolution without treatment of this pain causes depression, stress, sleep deficit, and malnutrition with disastrous consequences for the mother and fetus. Therapeutic management for the treatment of headaches should be initially non-pharmacological, and low-risk fetal drugs should be used in the absence of a response.

Keywords: headache, migraine, pregnancy, treatment

INTRODUCTION

Pregnancy headache is the main cause of addressability for a neurological consultation. The diagnosis of the headache consists in the differentiation of the primary character from the secondary one, in this sense being identified in several situations [1]:

- the patient suffers from a primary headache and now presents with a normal headache;
- is not known to have a primary headache and presents with the first severe headache during pregnancy;
- is known with primary headache and presents either with ordinary pain or with pain different in intensity and phenotype.
- it is known as a basic disease, and headache is a symptom of it.

In the case of potentially fertile patients with headaches, preconception counseling is especially important, involving the coordination of both the gynecologist and the neurologist. A neurological consultation is necessary if the pregnant woman reports a change in headache compared to the usual symptoms. In pregnancy, the etiology of secondary headache is most often observed in the existence of hypertension or fever. A migraine with aura increases the risk of preeclampsia, stroke, and cerebral venous thrombosis. In postpartum, a cause of headaches is a post-dural headache due to changes in cerebrospinal

fluid pressure. Also, the pain might be primary, due to vascular disease or preeclampsia [2].

Regarding the imaging of the brain and cerebral circulation in the suspicion of secondary causes of headache, MRI is preferred instead of CT due to radiation exposure of the fetus. However, CT scans of the mother's head are associated with minimal fetal side effects, with the embryocidal effect achieved by administering a contrast agent such as Gadolinium [3,4]

Headache during pregnancy is most common as a result of migraine. The treatment of headaches during pregnancy consists initially of the administration of acetaminophen or triptans as backup medication. Prevention of recurrent headaches is done by administration of propranolol, and sometimes amitriptyline and verapamil [5].

This article reviews the data on headache and pregnancy, highlighting the clinical and therapeutic features and the risk-benefit balance on the child during pregnancy and lactation.

MATERNAL HEADACHES IN PREGNANCY

Primary headaches

Migraine

Migraine is defined as an episodic, multifactorial brain disorder. Symptoms consist of moderate-severe seizures, unilateral headache, throbbing, nau-

TABLE 1. Synopsis of primary and secondary headaches in pregnancy

	Debut	Headache	Nausea/ vomiting	Visual disturbances	Seizures	Papillary edema	Neurological deficit	Others
Primary headaches								
Migraine	T1	unilateral, throbbing	+	photophobia	moderate/ severe	-	-	phonophobia
Tension/ type migraine	NA	bilateral	-	photophobia	-	-	-	phonophobia
Cluster headache	NA	unilateral	-	tearing, miosis	-	-	-	rhinorrhea
Secondary headaches								
Cerebral venous thrombosis	T3	subacute	-	-	+	+	focal	
Headache in preeclampsia	pregnancy/ postpartum	bilateral, rare diffuse	-	+	-	+	-	
Pituitary apoplexy	NA	-	+	+	-	+	+	adrenal deficit
Subarachnoid hemorrhage	T2, T3	+	+	photophobia	-	-	focal	
Headache accompanying ischemic stroke	NA	unilateral/ bilateral	-	-	-	-	+	
Arterial dissection	NA	unilateral	-	-	-	-	-	neck pain, diplopia, Horner syndrome
Idiopathic intracranial hypertension	NA	+	-	-	-	unilateral	-	diplopia, tinnitus, paralysis of 6 th nerve
Reversible cerebral vaso-constriction syndrome	postpartum	acute, severe, diffuse, recurrent	-	-	+	-	-	
Posterior reversible encephalopathy syndrome	NA	bilateral	+	-	-	+	-	convulsions, blindness, altered consciousness
Meningitis	NA	+	+	-	-	-	-	fever, cervical stiffness, altered mental state
Chorio-carcinoma	NA	+	-	-	-	-	-	dizziness

sea, vomiting, and/or photophobia/ phonophobia, lasting about 3 days, with or without aura, with visual and sensory signs. The condition is aggravated by physical activity, instead more than half of pregnant women notice a reduction in the frequency and sometimes the severity of attacks [6]. The mechanism of migraine headache is apparently due to the absence of hormonal fluctuations during pregnancy, only a small percentage find an increased frequency or exacerbation of attacks, usually in the first trimester [7,8]. Due to a reversible focal neurological deficit, the initial symptoms of migraine may be associated with an aura [3].

Patients with pre-existing migraine did not present any risk regarding the evolution of pregnancy or with the possible increase of fetal malformations. Instead, it is a risk factor for hypertensive/vascular

diseases in pregnancy, premature birth, and low birth weight. In patients with migraine who develop preeclampsia, there is an increased risk of cerebral palsy and perinatal death [4]. Migraine may be associated with an increased incidence of hyperemesis in pregnant women, and sleep disorders [9]. In pregnant women with migraines due to the increased risk of preeclampsia/eclampsia, pregnancy will be closely monitored due to the increased risk of vascular complications, stroke, thromboembolic disease, and heart disease [10,11].

The therapeutic strategy includes the administration of a combination of analgesic and antiemetic drugs. Thus, it is initially recommended to administer droperidol (minor risk of minor birth defects) and intravenous fluids, followed in severe cases by sumatriptan or propofol. Corticosteroids, dihydroer-

gotamine, prochlorperazine, and valproic acid are associated with an increased risk of birth defects [12,13,14].

Tension-type headache

Tension-type headache (TTH) in pregnancy is relatively common and is usually bilateral, constrictive, and associated with photophobia or phonophobia [3]. Headache can be treated with analgesics (acetaminophen), non-steroidal anti-inflammatory agents being avoided [4,15]. The evolution of TTH is towards remission and improvement in a quarter of patients or without any change. Regarding aggravation, it is contested; some authors mention a rare aggravation of this pathology, while others do not mention this possibility [16,17].

Cluster headache

Cluster headache is a rare primary headache (<0.3% of pregnancies) with increased intensity, which rarely affects women compared to men [9,18]. The symptoms are represented by headache (unilateral, with variable intensity, with temporal location, orbital/ supraorbital, with repeated attacks), rhinorrhea, miosis, and tearing [3]. Limited treatment options during pregnancy consist of administering high-flow oxygen, triptans (sumatriptan), or the intranasal use of lidocaine [19].

Secondary headaches

Cerebral venous thrombosis (CVD)

Prothrombotic status in pregnancy increases the risk of CVD, especially in the third trimester of pregnancy. Symptoms include subacute headache, seizures, papillary edema, and focal neurological deficit. The diagnosis is imaging by using CT without a contrast agent that will identify edema or nonspecific cerebral infarction in the situation when MRI is not accessible. The initial treatment of choice is anticoagulant with low molecular weight heparin that does not cross the placenta, then, it will be continued during pregnancy and postpartum for six weeks [20,21].

Headache in preeclampsia and eclampsia

The symptoms appear during pregnancy or postpartum being characterized by a bilateral, progressive, pulsating headache, located frontally, temporally, occipital or rarely diffuse, and visual disturbances. The condition is aggravated by physical exertion and resolves within one week of normalizing blood pressure [9,22].

Pituitary apoplexy

The condition is caused by a hemorrhagic or ischemic process that leads to the appearance of infarction areas. The symptoms are nausea, vomiting, visual impairment, and rarely altered mental state or secondary adrenal insufficiency. Neuroimaging (CT,

MRI) may show either a recent hemorrhage or an area with high density in the pituitary gland. Treatment in patients with visual, neurological, or severe mental impairment requires urgent intracranial surgical decompression and hydro electrolytic rebalancing, and corticosteroids in adrenal insufficiency [23,24].

Subarachnoid hemorrhage

The condition occurs either in the second trimester secondary to an arterial-venous malformation or in the third trimester due to a ruptured aneurysm. The proposed mechanism would be hypervolemia and increased cardiac output that may lead to rupture of the aneurysm, in contrast to other studies that would not show an increased risk in pregnancy and labor. Symptoms are dominated by headache, nausea, vomiting, photophobia, and focal neurological deficit. The diagnosis is based on a CT examination of the head, which can sometimes be associated with either CT angiography or lumbar puncture with CSF analysis. The treatment of subarachnoid hemorrhage requires emergency hospitalization to perform a neurosurgical intervention to reduce the risk of bleeding [25,26].

Headache accompanying ischemic stroke

Headache from ischemic stroke is rarely the main element of symptoms due to the self-limited character, with moderate and nonspecific intensity, unilateral or bilateral, with or without changes in consciousness. The diagnosis is corroborated by the occurrence of ischemic stroke and neuroimaging highlights its topography. The headache resolves quickly, and the treatment addresses the stroke [27,28].

Arterial dissection

A stroke caused by dissection of either the vertebral or the carotid artery has the following symptoms: unilateral headache, neck pain, diplopia, and Horner syndrome. Changes in the vascular wall by decreasing collagen synthesis along with hypervolemia and increasing cardiac output for arterial dissection in pregnant women. The diagnosis of choice is made by intra-arterial angiography, which highlights a double lumen, aneurysm, or occlusion. Therapy consists of establishing anticoagulation with low molecular weight heparin, except in cases with intracranial aneurysm, infarction, or intracranial progression of the dissection. In forms without ischemic symptoms, antiplatelet agents (aspirin) are used, or in case of contraindication stenting or endovascular repair to restore cerebral blood flow by correcting stenosis or occlusion [29,30,31].

Idiopathic intracranial hypertension

Idiopathic intracranial hypertension is diagnosed in case of an increase in opening pressure >250 mm H₂O with evidence of a normal CSF. The symptoms

of this condition are headache, visual disturbances (unilateral papillary edema, diplopia, and rarely blindness), tinnitus, and paralysis of the sixth nerve [32]. The imaging examination makes the differential diagnosis with other conditions that can generate intracranial hypertension and is based on the CT or MRI examination of the head without contrast.

Treatment is phased and includes diet, acetazolamide (caution when the maximum dose is below 2 g/day), lumbar punctures, and preoperative steroids. The surgery will be addressed to patients with severe visual impairment and consists of either fenestration of the optic nerve sheath or performing a ventricular or lumboperitoneal sound. The perinatal prognosis is the same as that of women who are not pregnant [33,34].

Reversible cerebral syndromes

a) Reversible cerebral vasoconstriction syndrome.

The headache is acute, severe, diffuse, and recurrent and can sometimes be associated with seizures; it is triggered by effort and/or emotion. It occurs frequently in the postpartum period, and due to its recurrent nature, the headache resolves at approximately twelve weeks [35].

b) Posterior reversible encephalopathy syndrome.

The condition begins insidiously with bilateral headache, located occipital, nausea, vomiting, convulsions, visual disturbances that can lead to blindness, and an altered state of consciousness. It is associated with preeclampsia/ eclampsia, hypertensive encephalopathy, or renal failure. The disease progresses in 12–48 hours, being frequently reversible when therapy is instituted early in the presence of an accurate diagnosis, with complete remission within a period of days or weeks [36,37].

Meningitis

Pregnancy meningitis manifests in fever, headache, nausea, vomiting, cervical stiffness, and sometimes altered mental state. In the etiopathogenesis of this disease are otitis/ sinusitis with *Streptococcus pneumoniae*, *N. meningitidis*, and *Listeria monocytogenes*. The diagnosis is made on lumbar punctures with CSF examination, blood cultures, and brain CT. Antimicrobial treatment should be performed early and consists of administering a third-generation cephalosporin, vancomycin, or antiviral (acyclovir). In the third trimester of pregnancy, corticosteroid therapy (dexamethasone) reduces neonatal mortality [38,39].

Choriocarcinoma

The main problem with this condition is early diagnosis due to the increased risk of metastasis. Brain metastases are accompanied by headaches, visual disturbances, and intense dizziness. The diagnosis is made on account of neuroimaging ± lumbar puncture. When dosing the HCG concentration, a blood / CSF ratio <40: 1 shows brain damage [40,41].

CONCLUSIONS

The main concern regarding the etiopathogenesis of headaches is to differentiate the primary causes from the secondary ones with a poor prognosis. This will lead to a personalized therapeutic strategy and the involvement of a multidisciplinary team. The role of neuroimaging is defining (MRI, CT), avoiding the use of contrast agents associated with adverse effects on the fetus. Assessment of CSF by lumbar puncture is also an important means of diagnosis. Medical or surgical therapy should be carefully selected according to the severity of the condition and consider fetal risks.

Conflict of interest: none declared
Financial support: none declared

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