

# Diagnosis of Acute Neurologic Emergencies in Pregnant and Postpartum Women



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## KEYWORDS

- Eclampsia • Posterior reversible encephalopathy syndrome
- Reversible cerebrovascular constriction syndrome
- Cerebral venous sinus thrombosis • Pregnancy

## KEY POINTS

- Pregnant and postpartum patients with headache and seizures are often diagnosed with preeclampsia or eclampsia because they are the most common conditions; however, other etiologies must be considered.
- Most cases of cerebral venous sinus thrombosis present in the early postpartum period.
- Although stroke and other cerebrovascular diseases are uncommon in pregnant women, the incidence is higher than in age and sex-matched nonpregnant individuals.
- Computed tomography scanning is insensitive to many of the acute neurologic conditions that affect pregnant and postpartum women.

## INTRODUCTION

Acute neurologic symptoms in pregnant and postpartum women may be owing to an exacerbation of a preexisting neurologic condition (eg, multiple sclerosis or a known seizure disorder) or to the initial presentation of a non-pregnancy-related problem

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(eg, a new brain tumor). Alternatively, patients can present with new, acute onset neurologic conditions that are either unique to or precipitated by pregnancy.

In this review, we focus on these latter conditions. The most common diagnostic tool used in emergency medicine to evaluate many of these symptoms—noncontrast head computed tomography (CT)—is often nondiagnostic or falsely negative. Misdiagnosis can result in morbidity or mortality in young, previously healthy individuals. Therefore, if a poor outcome occurs, the medical, social, and medicolegal impact is usually high. For all of these reasons, prompt diagnosis is imperative.

The unique pathophysiologic states of pregnancy and the puerperium have been reviewed.<sup>1–4</sup> Increasing concentrations of estrogen stimulate the production of clotting factors, increasing the risk of thromboembolism. Increases in plasma and total blood volumes increase the risk of hypertension. Elevated progesterone levels in pregnancy increase venous distensibility and, potentially, leakage from small blood vessels. The high estrogen levels decrease in the postpartum period. Combined, these hormonal changes can result in increased permeability of the blood–brain barrier and vasogenic edema.

Preeclampsia, the new onset of hypertension and proteinuria or laboratory abnormalities after 20 weeks in a previously normotensive woman, occurs in 2% to 8% of pregnancies.<sup>5</sup> The incidence of preeclampsia has increased by 25% in the United States over the last 20 years,<sup>6</sup> which has been attributed in part to the increase in maternal obesity and maternal age.<sup>7</sup> Diagnostic criteria for preeclampsia were recently revised.<sup>8</sup> Whereas previously preeclampsia was defined by systolic blood pressures of 140/90 mm Hg or greater and proteinuria of 0.3 g or greater of protein in a 24-hour urine specimen, the new criteria allow for the diagnosis of preeclampsia without proteinuria, permit the use of a spot protein/creatinine ratio or urine dip to diagnose preeclampsia, and rename what was previously called “mild preeclampsia” as “preeclampsia without severe features,” among other changes. Preeclampsia is now defined as blood pressures of 140/90 mm Hg or greater on 2 occasions at least 4 hours apart after 20 weeks of gestation in a woman with a previously normal blood pressure, plus either proteinuria, or in the absence of proteinuria, thrombocytopenia, renal insufficiency, impaired liver function, pulmonary edema, or new-onset neurologic symptoms such as visual changes or headache. In practical terms, this means any woman with persistently increased blood pressure and a persistent new headache meets diagnostic criteria for preeclampsia, and the headache would confer the diagnosis of preeclampsia with severe features. However, other neurologic conditions requiring significantly different management than preeclampsia should be considered in these cases. Of note, the revised criteria state that severe range blood pressures (those  $\geq$  160/110 mm Hg) “can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy,”<sup>8</sup> to stress that antihypertensive therapy should not be delayed in these women to confirm a diagnosis.

Eclampsia is defined as preeclampsia plus a generalized tonic–clonic seizure in the absence of other conditions that could account for the seizure. Eclamptic seizures occur in up to 0.6% of women with preeclampsia without severe features, and in 2% to 3% of women with preeclampsia with severe features.<sup>9</sup> Of note, eclampsia rarely can present atypically, without elevated pressures or proteinuria so it should remain on the differential for women with new-onset seizures in pregnancy even if the classic criteria of hypertension and proteinuria or laboratory abnormalities are not satisfied.<sup>10–12</sup> Maternal mortality rates for eclamptic women have been reported to be as high as 14% over the past few decades, with the highest rates in developing countries.<sup>13</sup> Although the most common causes of death in eclamptic women are brain ischemia and hemorrhage, most eclampsia-related neurologic events are transient, and long-term deficits are rare in properly managed patients.<sup>14</sup>

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