

**SPEAKER 1:** I'll switch gears and talk about stroke in pregnancy and pregnancy complications now. So there is increased risk of pregnancy in late second and third trimester. And also postpartum up to 12 weeks after delivery. And here, I would point out that more strokes are hemorrhagic strokes not necessarily all ischemic when it comes to pregnancy and peripartum strokes. So I'm talking about all strokes-- ischemic and hemorrhagic.

In terms of occurrence, 34 per 100,000 pregnancies contrast that with 21 per 100,000 in non-pregnant women if you're talking about the same age group. So clearly, the higher or an expanded plasma volume, higher blood pressure, thrombogenicity, all of that does increase your risk of stroke during pregnancy.

This is a scan of a 34-year-old woman G1 P0, who developed high blood pressure and confusion 10 days after delivery. MRI changes as you can see here. This is all normal. However, the basal ganglia doesn't look normal. They're hyper intense lesions. There are hyper intense lesions in the posterior part or the back of the brain. The occipital part of the brain suggestive of posterior reversible encephalopathy syndrome.

Preeclampsia, as most of you know, is new onset hypertension. 140/90 neurons have hypertension beyond 20 weeks of pregnancy. And you also have proteinuria greater than 300 milligrams in 24 hours. But on top of that, if you start getting neurologic symptoms in the form of confusion, visual deficits, hyperreflexia, or any other focal signs, that puts this in the category of severe eclampsia. And emergent delivery is recommended.

There are some other vascular syndromes or vasculopathies we see they are more common during pregnancy. One is reversible cerebral vasoconstrictor syndrome where if you do an MRI scan or angiogram, you would see narrowing and dilatation of a medium and large sized artery inside the brain. Ischemic stroke is more common than with non-pregnancy etiologies. So there are other scenarios where you can see a reversible cerebral vasoconstrictor syndrome. Medication induced or [INAUDIBLE] drugs, et cetera.

PRES, which is not necessary at present in eclampsia. It can be seen in other disorders such as hypertensive encephalopathy and uremia where there is vasogenic edema of white and gray matter basically that is a sudden elevation of blood pressure. So malignant hypertension associated with breakage of blood brain barrier because of the sudden elevation in high blood pressure, the cerebral regulation fails, and therefore there is capillary leakage especially in the posterior part of the brain leading to vasogenic edema. And the symptoms are confusion and cortical blindness.

Treatment. Aggressive blood pressure management and magnesium sulfate. It's important to remember that up to 12% can have an extremely malignant course. So don't get deceived by the reversible terminology that's included in press or reversible vasoconstrictor syndrome. It's not always reversible.

Now we talked about increased risk of stroke during pregnancy. What about stroke risk beyond pregnancy. So what happens if you had complications during pregnancy? Whether it was hypertension, stroke, eclampsia, what are your future risk of hypertension or stroke later in life? And that is what the patient wants to know from you. Not that I have delivered. And now my this off hypertension, eclampsia, and stroke are all eliminated because the baby is out.

That's what we used to think. And some people still believe that. That all uterus are gone. You're good to go. I wanted to make sure that I highlighted this very long path. This can be almost up to 30 years, three decades, beyond the time that it does happen. So pregnancy risk for eclampsia can lead to stroke, both ischemic stroke, hemorrhagic strokes, and cardiovascular disease in the post-childbearing age. 30 years after the initial event.

And of course, this has been shown lead epidemiological studies. So not necessarily we have all the explanations as to why this happens. There are theories. But not clear causal relationship and explanations. Eclampsia may be the first sign of vascular risk in women. If you think about it, if we see that this can increase your risk of stroke, hemorrhage, and cardiovascular disease later in life, why don't we treat this as having a MI at age 25? Why not?

We definitely mention hypertension MI. If you had a MI at age 30, that will be

recorded in your medical records. As a stroke neurologist, when I'm looking at my 55-year-old woman with a stroke, of course I'm checking the box for hypertension, diabetes. Do you smoke? I never asked did you have a eclampsia?

So we do need to start this conversation. And this doesn't only belong in the hospitals. In the community. Wherever you are interacting with women. Not only in childbearing ages but even decades later who have been in this situation.

Now stroke risk related to oral contraceptives. I want to give some context. There are 10.4 million women on oral contraceptives. So I'm not going to stand here and tell you that it is bad, and it causes higher strokes in these women. But it's important to remember that in older age group, the incidence of stroke is higher. And there is no risk with progestin only formulation.

So it's important to consider the options given your stroke risk. Someone who already has a history of high blood pressure. Someone who already has a very strong family history of heart disease and stroke. At least they know their options, which it's important to discuss these things. And I'm going to give you this reference here. [INAUDIBLE].

This is a central guideline focused towards stroke prevention in women. This is the recent guideline 2014. Most of my presentation, things that I'm highlighting, can be found in this guideline.

So there is class 1 level of evidence for measurement of blood pressure before starting contraception. Also in oral contraceptive users, aggressive therapy for stroke risk factors is reasonable. And if you have additional risk factors, such as smoking, prior thromboembolic events, oral contraceptives may be harmful.