Pre-eclampsia

Professor Shaun Brennecke
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"A major cause of maternal and perinatal morbidity and mortality in Australia"

Transcribed directly from MOGCAST Episode 3. Listen here:
https://open.spotify.com/show/6dtXQ6jLjAIi7lHtP71cYe?si=7671224caacc4f4a

"This mini episode is brought to you by Professor Shaun Brennecke, the Director of the Department of Maternal Fetal Medicine at the Royal Women's Hospital and Professor with the University of Melbourne. The title of this mini podcast is Pre-eclampsia.

Pre-eclampsia is a multi-system disorder of human pregnancy, with pregnancy-induced hypertension and proteinuria as classical features. It is the most serious common medical disorder of pregnancy. It occurs in 5 to 10 per cent of pregnancies and is a major cause of maternal and perinatal morbidity and mortality in Australia and throughout the world.

Women who experience pre-eclampsia, especially if it occurs at less than 34 weeks gestation, have an increased risk of cardiovascular disease later in life. Pre-eclampsia is defined as maternal hypertension with a blood pressure greater than 140 on 90 developing after 20 weeks gestation and the coexistence of one or more of the following new onset conditions.

Proteinuria and organ dysfunctions involving renal insufficiency, liver involvement, neurological complications and hematological complications. As well, utero placental dysfunction can occur, commonly as fetal growth restriction. Historically and currently, the principal justification for antenatal care is the measurement of a pregnant woman's blood pressure, which should be done at each antenatal attendance.

Blood pressure measurement in pregnancy needs to be taken carefully with the pregnant woman at rest, either seated or semi recumbent, but not in a supine position because of the potential for the heavily graven uterus to cause aortocaval compression, which would lead to artifactually abnormal and misleading blood pressure measurements.

A standard blood pressure cuff size is appropriate if a woman's arm circumference is less than or equal to 33 centimetres. But a larger cuff size needs to be used if the woman's arm circumference is greater than 33 centimetres. In pregnancy, systolic blood pressure is measured at the Korotkoff one sound, while diastolic blood pressure is measured at the Korotkoff five sound.

A normal blood pressure level in pregnancy is less than 140 on 90 and pregnancy hypertension is diagnosed if the blood pressure is persistently above 140 on 90 or thereabouts. A blood pressure greater than or equal to 170 on 110 requires urgent lowering because of the increased risk of cerebrovascular accident or stroke and therefore warrants immediate antihypertensive treatment.

When pre-eclampsia is established, the key management principles involve admission to a maternity hospital with stabilization of the woman's blood pressure and the prevention of eclampsia by seizure prophylaxis. Therefore, attention to fluid balance is required because of the renal dysfunction present in this condition and because of the utero placental dysfunction, it is common in pre-eclampsia, careful fetal welfare surveillance is required.

In the most severe cases of pre-eclampsia multidisciplinary care is advisable, involving not only the obstetrician and midwife, but also potentially the neonatologist, the anesthetist. and obstetric medicine physicians.

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"HELPS syndrome is a form of pre-eclampsia characterized primarily by hemolysis, elevated liver enzymes and low platelet count"

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Because pre-eclampsia is a disease of pregnancy it is cured by ending the pregnancy and therefore careful consideration to the timing of delivery taking into account maternal and fetal factors is a critical management step in dealing with pre-eclampsia.

Having delivered the woman with pre-eclampsia, however, the story does not end there. Careful attention must be paid to the third stage management following delivery. Normally, an oxytocic is given to prevent the likelihood of primary postpartum hemorrhage. In pre-eclampsia the use of a third stage oxytocic, such as ergometrine is prohibited because of that drug's potential for hypertension as a side effect which would exacerbate the hypertension of pre-eclampsia.

Therefore, the third stage oxytocic, preferred in women with pre-eclampsia, is oxytocin or syntocinon as it is known by its trade name, which does not carry the same potential for systemic hypertension as a side effect. Careful observation of a woman who's had severe pre-eclampsia in the days after delivery is important because it can take some days for the pathophysiological changes that generated pre-eclampsia to abate and during those few days the woman remains at risk of some of the complications of pre-eclampsia such as eclampsia and stroke.

It is also important when the dust has settled to follow up with the woman to provide an explanation about what happened, answer her questions, and also advise her as required about the potential for recurrence in future pregnancies and the possibility of long term cardiovascular ill health that would require careful surveillance in years to come.

In managing the hypertension associated with pre-eclampsia there are a number of available drugs which are safe and effective in pregnancy when used appropriately. Methyldopa, Labetalol and Nifedipine are available often in oral medication regimens. Hydralazine and Diazoxide are often reserved for acute intravenous treatment to lower severe cases of hypertension in pregnancy.

To prevent or treat eclamptic fits, the preferred anticonvulsant is magnesium sulfate given intravenously. Care needs to be taken when administering magnesium that toxic levels are not present when it is being given intravenously, keeping in mind that magnesium is excreted through the kidneys and with renal dysfunction occurring in pre-eclampsia, the excretion can be slower than normal.

In the event of magnesium toxicity, calcium chloride given intravenously is a prompt antidote. A key treatment principle with pre-eclampsia is that it is cured by delivery, but not at delivery. And careful surveillance, as I say, in the days after delivery should be carried out before the woman can be considered completely cured of that particular episode of pre-eclampsia.

The HELPS syndrome is a form of pre-eclampsia characterized primarily by hemolysis, elevated liver enzymes and low platelet count. In cases of the HELP syndrome, while there will be mild hypertension and a degree of proteinuria, the hypertension and proteinuria may not be as prominent as in other cases of pre-eclampsia. But features relating to hemolysis, elevated liver enzymes and low platelet count as identified by a full blood examination and liver function tests can allow the diagnosis of the HELP syndrome variant of pre-eclampsia to be made.

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“A risk score can be provided for the likelihood of pre-eclampsia developing”

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Pre-eclampsia can be prevented by the administration of low dose aspirin taken at night from the first trimester until 36 weeks gestation.This prophylactic treatment has been shown to reduce the risk of pre-eclampsia, particularly its early onset form.

It's also now possible to predict the particular risk a woman might run of developing pre-eclampsia in a given pregnancy. This can be done, first of all, at the end of the first trimester using a combined assessment of maternal blood pressure, clinical history, uterine artery doppler positivity index, and the measurement of serum placental growth factor.

The results of these tests can be combined in an algorithm that has been generated and validated by the Fetal Medicine Foundation in London, and a risk score can be provided for the likelihood of pre-eclampsia developing that pregnancy. As well, there is a blood test, the sFlt-1/PlGF ratio test, sFlt-1 and PlGF being proteins released in abnormal amounts by the placenta, in particular during the latter half of pregnancy. A measurement of this ratio can provide an indication of the likelihood of a woman developing pre-eclampsia in subsequent month or so of pregnancy. The test provides a negative predictive value for ruling out pre-eclampsia in the following month after the test is done of about 95 percent and it provides a positive predictive value of ruling in pre-eclampsia in the subsequent month of just under 40%.

Thank you. That completes this mini podcast on pre-eclampsia.”