Characterized by severe headaches, uncontrolled vomiting, and, in the most severe cases, blindness, seizures and comas, preeclampsia can lead to death if left untreated. In the United States, preeclampsia is the third leading cause of maternal mortality, and accounts for 20 percent of maternal deaths. There is presently no effective or reliable screening test to aid clinicians in the assessment of women at increased risk for developing preeclampsia. In such cases, pregnant women often don’t receive the monitoring or treatment they need until well after the complications associated with the condition have taken their toll.

Professor Marilyn Cipolla of the University of Vermont has focused her research efforts on elucidating what causes neurological problems such as seizures and strokes in pregnant women with preeclampsia. In the process, she has discovered that high levels of a certain biomarker are linked with early-onset preeclampsia, as well as heightened risks of neurological conditions leading to brain injury. Cipolla’s blood test identifying levels of this biomarker in pregnant women could help clinicians predict when pregnant women are at an increased risk for suffering brain injuries associated with preeclampsia.

Professor Cipolla discovered a striking correlation between the levels of a molecule circulating in the blood of pregnant women diagnosed with early-onset preeclampsia (developing in the first 34 weeks of pregnancy) compared with non-pregnant and healthy pregnant women, as well as those with late-onset preeclampsia. This factor, identified as oxidized low-density lipoprotein (oxLDL), was found at levels 260 percent higher in women with early-onset preeclampsia. Cipolla’s research also revealed that increased oxLDL in the blood of early-stage preeclampsia patients in turn significantly increased blood-brain barrier permeability, a known pathway leading to strokes and other severe neurological events. Moreover, when oxLDL binds with its chief molecular receptor, LOX-1, a chain of events is unleashed: superoxide is produced, which generates peroxynitrite – high levels of which can lead to increased blood-brain barrier permeability. Cipolla has developed a simple blood test to measure levels of oxLDL in blood samples from women with preeclampsia to predict those at risk for severe disease with possible neurological involvement.

Patent Status
Provisional Patent Application Filed
Worldwide Rights Available

Advantages
• The first diagnostic test that can evaluate if a pregnant woman is at increased risk for suffering brain injury associated with preeclampsia
• Simple blood test format can be widely used to evaluate levels of oxLDL in pregnant women
• Can eliminate the need to administer magnesium sulfate – the current treatment for seizure prevention – in preeclamptic patients found to have low levels of oxLDL.

Applications
• Evaluates the risk of women with preeclampsia of suffering a seizure and the subsequent dangerous neurological complications caused by seizure
• Allows clinicians to provide effective monitoring and treatment of those women determined to be at increased risk for damaging neurologic events
• Provides researchers with a clinically relevant model for pursuing the identification of additional circulating factors in preeclamptic blood samples that correlate with an increased risk for developing brain injury.

Learn more about Dr. Cipolla’s research at: http://bit.ly/1bPxD4b
For more information and licensing opportunities, contact us at: Ph: 802-656-8780 or email: innovate@uvm.edu

Follow us on Twitter
Connect with us on LinkedIn
www.uvm.edu/uvminnovations/