New 3-D imaging technique shows promise for finding contractions that may lead to early birth

20 March 2019

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Scientists funded by the March of Dimes, the leading nonprofit for the health of moms and babies, have developed a new technique called electromyometrial imaging (EMMI) to display a color-coded, three-dimensional picture of uterine contractions that may one day help doctors identify and prevent preterm labor.

The results were published today in the journal *Science Translational Medicine*.

Yong Wang, Ph.D., and his team at Washington University School of Medicine in St. Louis used a sheep model to show that EMMI can reconstruct uterine electrical activation patterns from electrodes placed on the abdomen, and say the method could be safely used in the same way in humans.

3-D color-coded images and movies could enable researchers to identify the "uterine pacemaker" sites where contractions begin, and better understand the velocity, direction, and coordination of uterine contractions that contribute to labor resulting in preterm birth.

"We've got imaging techniques to allow doctors to study another muscular organ – the heart," says Kelle H. Moley, MD, March of Dimes chief scientific officer. "Without even touching the heart, doctors can determine where each beat comes from, the direction in which it moves, how fast it moves, and much more. There are medications and interventions, such as ablation, that are commonly used to deal with heartbeats that are too slow or too fast. EMMI is a new way to study the pregnant uterus in a similar fashion, and we hope it will lead to the development of similar types of drugs and treatments to stop contractions that lead to preterm labor."

Current uterine monitors for pregnant women cannot accurately measure the exact location of electrical initiation and location-specific patterns of uterine contractions. Dr. Moley says today's publication is the culmination of five years of study at the March of Dimes Prematurity Research Center at Washington University School of Medicine in St. Louis to think about the uterus in a new way, and determine whether 3-D imaging of the uterus and localization of the foci of uterine contractions was even possible.

"Noninvasive High-Resolution Electromyometrial Imaging of Uterine Contractions in a Translational Sheep Model" by Wenjie Wu, Hui Wang, Alison Cahill, Phillip Cuculich, Yong Wang, et al. appeared today in *Science Translational Medicine*.

Provided by March of Dimes Foundation

APA citation: New 3-D imaging technique shows promise for finding contractions that may lead to early birth (2019, March 20) retrieved 21 September 2022 from https://medicalxpress.com/news/2019-03-d-imaging-technique-early-birth.html