Non-Invasive Ultrasound of Cervical Tissue Predicts Preterm Delivery Risk & Labor Induction Success

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of measuring changes in cervical microstructure using backscattered ultrasound to predict the likelihood of preterm birth or the success of inducing labor at full term.

Overview

Preterm birth is a major world health problem that results in significant infant deaths and medical conditions at a cost of $26 billion annually in the U.S. alone. Preterm birth rates have increased in the past century due to the increased incidence of high risk pregnancies with a lack of effective therapies to treat these conditions. Unfortunately, neither drugs that calm inflammation and/or decrease uterine contractions nor cervical sutures prevent preterm births.

The cause of preterm births appears to be the premature or accelerated “remodeling” of the cervix. This remodeling consists of the cervical tissue softening and shortening. The ability to accurately study this remodeling could make the monitoring of cervical changes possible, which could in turn provide information to predict preterm delivery, evaluate interventions for cervical stabilization and develop novel therapeutic strategies to avoid preterm births.

The Invention

UW-Madison researchers have developed a non-invasive method using backscattered ultrasound to measure changes in cervical microstructure that can predict the likelihood of preterm birth or the success of inducing labor at full term. The method involves applying ultrasound to the cervical canal at different angles to assess cervical remodeling, a process which occurs prior to delivery. A correlation then can be found between the amount of backscattering and the ultrasound angle. The method also allows scanning with different ultrasound frequencies to generate a more robust measurement of the microstructure.

Besides evaluating the microstructure, the method also can be used to measure the elasticity of the cervical tissue through acoustic radiation force. Since this assessment does not depend on compressive force by the operator, it is not user-dependent. In addition, a very small ultrasound transducer can be used inside the cervical canal without disrupting the tissue. The combination of the elasticity and backscattering/angle measurements relating to the microstructure may indicate the likelihood of a preterm birth or the success of inducing labor at full term.

Applications

- Assessing cervical microstructure
- Determining the likelihood of preterm delivery
- Determining the success of inducing labor at full term

Key Benefits

- Noninvasive
- Able to scan with multiple ultrasound frequencies
- Not user-dependent
- Easy to implement on existing ultrasound imaging systems

Additional Information

For More Information About the Inventors

- Timothy Hall

Tech Fields

- Medical Imaging : Ultrasound

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846