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New app can help doctors predict risk of preterm birth

A new app called QUiPP could help doctors to better identify women at risk of giving birth prematurely. The app, developed at King's College London, was tested in two studies of high-risk women being monitored at ante-natal clinics.

Worldwide 15 million babies are born preterm (before 37 weeks) each year and over a million of these die of prematurity-related complications. A number of factors are used to determine if a woman is at risk of giving birth prematurely, including a history of preterm births or late miscarriages. Two further factors which doctors can consider are the length of cervix and levels of a biomarker found in vaginal fluid known as fetal fibronectin, which are typically tested from 23 weeks. The investigators have further developed the fetal fibronectin test to be accurately used from the first half of pregnancy.

The app developed at King's uses an algorithm which combines the gestation of previous pregnancies and the length of the cervix with levels of fetal fibronectin to classify a woman's risk. The first study focused on women deemed to be a high risk of preterm birth, usually because of a previous early pregnancy, despite not showing any symptoms. The second study predicted the likelihood of early delivery in a group of women showing symptoms of early labor which often doesn't progress to real labor.

In the first study, published in the journal *Ultrasound in Obstetrics & Gynecology*, researchers collected data from 1,249 women at high risk for pre-term birth attending pre-term surveillance clinics. The model was developed on the first 624 consecutive women and validated on the subsequent 625. The estimated probability of delivery before 30, 34 or 37 weeks' gestation and within two or four weeks of testing for fetal fibronectin was calculated for each patient and analyzed as a predictive test for the actual occurrence of each event.

In the second study, also published in the journal *Ultrasound in Obstetrics & Gynecology*, data from 382 high-risk women was collected. The model was developed on the first 190 women and validated on the remaining 192. Probabilities of delivering early were estimated as above.

In both studies, the app was found to perform well as a predictive tool, and far better than each component (previous pregnancy, cervical length or fetal fibronectin) taken alone.

The authors conclude that the app can be used by clinicians to improve the estimation of the probability of premature delivery (before 34 weeks' gestation or within two weeks of the fetal fibronectin test) and to potentially tailor clinical management decisions.

However, further work is needed to clinically evaluate the model in practice, and to ascertain whether interventions improve the pregnancy outcome for women identified as high risk by the app.

Professor Andrew Shennan, lead author who is Professor of Obstetrics at King's College London and consultant obstetrician at Guy's and St Thomas' NHS Foundation Trust, said:

"Despite advances in prenatal care the rate of preterm birth has never been higher in recent years, including in the US and UK, so doctors need reliable ways of predicting whether a woman is at risk of giving birth early. It can be difficult to accurately assess a woman's risk, given that many women who show symptoms of preterm labor do not go on to deliver early.

"The more accurately we can predict her risk, the better we can manage a women's pregnancy to ensure the safest possible birth for her and her baby, only intervening when necessary to admit these 'higher risk' women to hospital, prescribe steroids or offer other treatments to try to prevent an early birth."

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QUiPP is available to download for free from the Apple store.

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Notes to Editors

Article:

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'Development and validation of a predictive tool for spontaneous preterm birth incorporating cervical length and quantitative fetal fibronectin in asymptomatic high-risk women' by Kuhrt *et al.* is published in the journal *Ultrasound in Obstetrics & Gynecology* in January 2016 (DOI: 10.1002/uog.14865) and is accessible here.

'Development and validation of a predictive tool for spontaneous preterm birth, incorporating quantitative fetal fibronectin, in symptomatic women' by Kuhrt *et al.* is published in the journal *Ultrasound in Obstetrics & Gynecology* in February 2016 (DOI: 10.1002/uog.14894) and is accessible here.

The studies were supported by Tommy's Charity.

About King's College London:

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About ISUOG:

1,400 women die from pregnancy related causes every day, worldwide. The International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) is dedicated to ensuring that all women have access to competent ultrasound and that obstetric and gynecological conditions are effectively diagnosed. ISUOG delivers high quality learning through its education program and World Congress and disseminates research information and clinical guidance through its journal *Ultrasound in Obstetrics & Gynecology*. With more than 13,500 members across 128 countries, ISUOG is committed to improving health outcomes for women and their families across the world.

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