Early pregnancy test may predict miscarriage and chance of twins

HOME tests can tell you if you're pregnant – but what if they could also reveal if you're expecting twins, or likely to miscarry? What do you think about it? Using algorithms to predict the outcome of a pregnancy based on the proteins in a woman's urine could make this a reality.

Pharmacy kits today can tell a woman if she's pregnant and how far along she is, but many uncertainties remain. Three-quarters of miscarriages occur in the first three months of pregnancy, and many women refrain from sharing their news until after this time. But that may change, thanks to a test developed by MAP Diagnostics in Hertfordshire, UK. "We want to inform parents of their potential success of having a healthy child," says the firm's founder, Stephen Butler.

"We want to inform parents of their potential success of going on to have a healthy child"

The test analyses the proteins in a woman's urine, and can predict the chances of a successful birth, a miscarriage, or pre-eclampsia, as well as whether a woman is pregnant with twins.

The test was inspired by IVF. Traditionally, the healthiest embryos are chosen by eye for implantation in women undergoing this treatment. Newer approaches remove a cell from each early embryo and use a genetic test to screen for abnormal chromosome numbers or genetic mutations linked to poor pregnancy outcomes, but these tests are expensive, invasive and can get it wrong.
Non-invasive approaches are the way forward, says Francisco Dominguez at the IVI Foundation in Valencia, Spain, who has also been trying to use proteins released by embryos to predict their health.

Embryos secrete proteins that appear in IVF culture medium or the urine of their mothers. Rather than a pee stick, Butler's test uses a small mass spectrometer, commonly found in hospitals, to identify all of these proteins in urine.

To make their predictions, the team use an algorithm they developed by analysing samples from 121 women who were between 6 and 10 weeks pregnant. By identifying differences in the protein profiles of the samples, the algorithm could work out which patterns seemed to be linked to miscarriage. Their findings were presented at the European Society of Human Reproduction and Embryology annual meeting in Lisbon, Portugal, in June.

Other algorithms can predict twins, or if the fetus is likely to be carrying chromosomal abnormalities. But before the test is offered widely, the team wants to fine-tune the

algorithms. They are planning to analyze around 10,000 samples to improve detection of chromosomal abnormalities that cause Down's syndrome, for example, before developing a home-testing kit.

A test for miscarriage risk would be useful, but only if it were extremely accurate, says Zev Williams at the Albert Einstein College of Medicine of Yeshiva University in New York. "You wouldn't want a lot of women being unnecessarily stressed or falsely reassured," he says.

The causes of many miscarriages are a mystery and can't always be prevented. Still, Dominguez thinks urine-based predictive tests hold important promise. "This is the future," he says.