

MIT develops painless way to monitor foetal heartbeat

A new system developed by a Massachusetts Institute of Technology (MIT) scientist and colleagues could allow much earlier and painless monitoring of the foetal heartbeat.

Minute fluctuations in a foetal heartbeat can be detected only during labour, which is usually too late to prevent serious or even fatal complications.

The new system could also cut down the rate of caesarean deliveries by helping clinicians rule out potential problems that might otherwise prompt the procedure.

'Our objective is to make a monitoring system that's simultaneously cheaper and more

effective' than what is currently available, said Gari Clifford, principal research scientist at the Harvard-MIT Division of Health Sciences and Technology.

Clifford expects that the system could be commercially available in two to three years pending FDA approval. While only a minority of pregnancies suffer from fluctuations in the foetal heartbeat, those that do can result in negative outcomes.

These problems include certain infections and a loss of oxygen to the baby if it is strangled by its own umbilical cord.

Ultrasound can detect the heartbeat quite early in a pregnancy, but it is not sensitive enough to catch variations in the rhythm that could indicate problems.

Electrocardiography (ECG), which records cardiac electrical activity, can indeed catch subtle changes in foetal heartbeat. But the problem is that until now there has been no way to reliably use the technique, except by attaching an electrode to the baby's scalp during labour.

Doctors can monitor the foetal ECG signal non-invasively through electrodes on the mother's abdomen, but it is weak compared to the maternal heartbeat and surrounding noise.

Clifford notes that 'one of the nice things about monitoring the foetal ECG through the mother's abdomen is you're getting a multidimensional view of the foetal heart, because its electrical activity is recorded from many different angles.'

The single probe now used to monitor the heartbeat during labour gives data from only one direction. 'So with our system it's like going from a one-dimensional slice of an image to a hologram,' Clifford said, according to an MIT release.

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