

Changes in foetal hearts found in pregnant women with diabetes or obesity

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Changes in foetal hearts have been found in pregnant women with diabetes or obesity, in research presented today at EuroEcho-Imaging 2015 by Dr Aparna Kulkarni, paediatric cardiologist from the Bronx, New York, USA.

The annual meeting of the European Association of Cardiovascular Imaging (EACVI), a registered branch of the European Society of Cardiology (ESC), is held 2 to 5 Dec. 2015 in Seville, Spain.

Dr Kulkarni said: "The main concept behind this study is of foetal programming. This refers to changes that occur in the structure and physiology of tissues in the foetus as a result of the mother's health."

She continued: "Diabetes and obesity are major epidemics of the present century. I see a lot of mothers with one or both conditions in my clinical practice and wanted to investigate if these maternal conditions had any effect on the foetal hearts."

In 2014 there were 387 million people in the world with diabetes and this is expected to increase to nearly 600 million by 2035.² Worldwide obesity has more than doubled since 1980 and in 2014 more than 600 million adults were obese.³

In the United States, [pregnant women](#) with diabetes and some with obesity are routinely referred for standard of care foetal echocardiograms, which show a picture of the baby's heart. During 2012

to 2015, the study prospectively enrolled 82 pregnant women with diabetes and 26 pregnant obese women with a body mass index (BMI) of more than 30 kg/m². A control group of 70 healthy pregnant women who volunteered to have a foetal echocardiogram was used for comparison.

The researchers examined the echocardiograms to see how well the [heart muscle](#) of each foetus was contracting and relaxing. Next they processed the pictures using a method called speckle tracking to generate more detailed information on heart muscle function by evaluating the heart muscle motion.

"Speckle tracking echocardiography can detect heart abnormalities at the subclinical level, in other words before standard echocardiographic techniques may detect an abnormality." said Dr Kulkarni. "In our study, it highlights abnormalities without obvious functional heart problems in the foetus."

The researchers found subclinical changes in the myocardium (heart muscle) of foetuses of mothers with diabetes and also foetuses of mothers with obesity, compared to the foetuses of healthy women. The changes were not apparent by routine echocardiographic techniques.

Dr Kulkarni said: "On routine standard echocardiographic images, it did not seem like these hearts were significantly affected. But with speckle tracking we had evidence that the myocardial function was unfavourably altered in the hearts of foetuses of mothers with diabetes and obesity."

"Our findings potentially have implications in a world where both diabetes and obesity are skyrocketing," said Dr Kulkarni.

But she added that further studies were needed to find out if these foetal changes affect the cardiovascular health as a child or an adult, when

during pregnancy the hearts are affected and whether anything can be done to alter this course. As an extension of the current study, Dr Kulkarni will examine the babies' hearts at one year of age to see if the abnormalities are still present, get worse, or have disappeared.

Dr Kulkarni concluded: "These are important results but I don't want pregnant women with diabetes or obesity to think that something will definitely go wrong with their pregnancy. We need more answers about what impact [diabetes](#) and [obesity](#) in the mother may have on the child after birth, before coming to firm conclusions about implications for the health of the baby."

Provided by European Society of Cardiology

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