

Choice of monitoring method could be key for babies with poor growth in the womb

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Credit: CDC.gov

Babies that grow poorly in the womb could have better outcomes if a method for the timing of delivery was used more widely, a study suggests.

In some pregnancies, there is an abnormal blood flow from the placenta and the fetus does not grow adequately in the womb, putting it at risk of being stillborn.

Doctors sometimes decide to deliver these babies early, before the lack of oxygen and increased acidity in the tissues becomes too damaging. This decision involves balancing the risks associated with keeping the baby in an adverse environment in the womb against the risks associated with preterm delivery. Currently there is no consensus on the most effective form of monitoring to inform this decision.

The Trial of Randomised Umbilical and Fetal Flow in Europe (TRUFFLE) aimed to help clarify the decision process and move towards harmonisation of practice across Europe. Published today in *The Lancet*, the results have indicated that babies delivered on the basis of a technique that monitors blood flow in a small vessel below their heart - late ductus venosus changes - had better neurodevelopmental outcomes than babies delivered on the basis of two other techniques.

Monitoring of late ductus venosus changes is not as widely available as cardiotocography (CTG), which monitors variation in the rate of the fetal heartbeat. Based on these findings, the researchers believe that babies with severely restricted growth should be supervised in specialist centres where late ductus venosus monitoring is available and there is expertise in using it.

Lead author Christoph Lees, from the Department of Surgery and Cancer at Imperial College London, said: "This is the first randomised trial to evaluate how best to monitor babies who are not growing adequately in the womb. Deciding when to deliver these babies is very difficult and the lack of agreement on which monitoring method to use means there can be variations in decision-making. The difference in timing will undoubtedly affect the baby's outcome so it is important to compare these three monitoring methods and assess which provides the best outcomes. We hope that TRUFFLE can help us to find the best way to make these difficult decisions and standardise the decision-making process across the UK and Europe."

TRUFFLE was a collaboration between 20 leading European specialist centres in Germany, Italy, Netherlands and the UK. It studied 500 women at 26-32 weeks of gestation who had been diagnosed with [fetal growth restriction](#) based on a below normal abdominal circumference and an abnormal flow of blood from the placenta. The participants were randomly allocated to receive one of three different monitoring

techniques that are currently used in obstetrics:

- Cardiotocography (CTG), which monitors variation in the rate of the [fetal heartbeat](#), through sensors placed on the mother's stomach, and produces a graphical readout.
- Early ductus venosus (DV) changes, which uses ultrasound to monitor the resistance in the blood flow in a [small vessel](#) (the DV) below the fetus's heart and indicates a shortage of oxygen.
- Late ductus venosus (DV) changes, which uses ultrasound to monitor the variability in the waveform of the [blood flow](#) in the DV and indicates abnormalities in contraction of the upper chambers of the fetus's heart.

Decisions on when to deliver the baby were made in each of the three groups on the basis of one of these three monitoring techniques. The researchers then compared the outcomes of babies across the three groups, recording the number of babies that survived and the number of babies at two years who had no disabilities that affected behaviour, memory or their ability to learn. Neurological impairment was assessed with a standard scale of infant development and on the basis of whether the child suffered from cerebral palsy or a loss of hearing or vision.

Assuming full term is 40 weeks, the women in the trial gave birth on average 10 weeks early. Ninety-two per cent of babies survived to discharge and there was no significant difference between groups on the number of deaths.

Of babies that survived, 95 per cent of those that were delivered according to late DV monitoring were free from neurodevelopmental problems, compared with 85 per cent of babies delivered on the basis of CTG and 91 per cent of those who were monitored according to early DV changes. This meant severe neurological impairment is three times more common (15 per cent of surviving babies) in the group monitored

with CGT than in group monitored with late DV changes (5 per cent of surviving [babies](#)).

"The results show it is optimal to monitor according to late DV changes for delivery as this lessens the chances of neurodevelopment problems at two years of age," said Mr Lees. "Having made this essential comparison we hope that our results will form the basis for guidelines nationally and internationally."

The TRUFFLE study recruited participants from 2005 to 2010. The researchers are now planning to launch a second trial - TRUFFLE 2 - which will study women diagnosed with fetal growth restriction at a later time in pregnancy (32 to 36 weeks). TRUFFLE 2 will follow up the development of children at about four to five years.

More information: C. Lees et al. 'The Trial of Randomized Umbilical and Fetal Flow in Europe (TRUFFLE) study: two year neurodevelopmental and intermediate perinatal outcomes.' *The Lancet* (2015).

Provided by Imperial College London

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