

MRI in the diagnosis of fetal developmental brain abnormalities: the MERIDIAN diagnostic accuracy study

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Plain English summary

The MERIDIAN diagnostic accuracy study

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Ultrasonography is routine in pregnancy to check that the baby's brain is developing as expected. However, no medical test is perfect and ultrasonography may miss some brain abnormalities, may get some brain abnormalities wrong or may diagnose an abnormality that is not really present. Magnetic resonance imaging (MRI) may help clarify difficult cases during pregnancy.

We wanted to find out if MRI was better than ultrasonography alone in making an accurate diagnosis. We recruited pregnant women whose ultrasound scan, performed by an expert, suggested that their baby had a brain abnormality, and referred them for a MRI scan. The results of the two tests were compared with each other and to the final outcome of the pregnancy.

Our results showed that using MRI in addition to ultrasonography improved the accuracy of the diagnosis in about one in four pregnancies. It changed the prediction of how the baby would develop in at least one in five cases. In many cases, the pregnancy was managed differently because of the MRI result. The MRI was acceptable to women, with 95% saying that they would have MRI again in a similar situation. Neither MRI nor ultrasonography accurately identified children who went on to have delayed development at the age of 2–3 years, but MRI was better than ultrasonography at ruling out developmental problems at this age. The MRI cost more than ultrasonography alone; therefore, whether or not it is worthwhile depends on the value placed on the decisions that changed as a result of its use.

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