

MRI outperforms Ultrasound at identifying the Large for Gestational Age (LGA) fetus

Waheed H.^{1,2}, Uus A.², Aviles Verdera J.², Neves Silva S.², Bansal S.², Kyriakopoulou V.², Hutter J.², Siassakos D.¹, David AL.¹, Rutherford M.²

¹EGA Institute for Women's Health, University College London ²Early Life Imaging Research Department, Kings College London

1. Background

Estimated Fetal Weight (EFW) = Clinically important
Large for Gestational Age (LGA, EFW >95th) fetus
→ Birth **complications**

LGA diagnosis = ↑chance of **intervention**
As per Big Baby Trial, diagnosis of LGA by UltraSound Scan (USS)
has large variation
& **false positives 60%** (Gardosi et al, 2025)

There is emerging evidence that MRI may be more accurate at predicting fetal weight, particularly where EFW >95th centile compared to USS.

4. Birth Outcomes

Antenatal US missed 5 cases of LGA at birth – 2 cases were later picked up. Leaving 3 cases that were completed clinically missed.

MRI correctly identified these as LGA



Spontaneous labour 40+3. Unassisted Vaginal Birth.
Birthweight 4.3kg. 2nd Degree. No PPH. No Shoulder Dystocia.



Spontaneous labour 39+2. Cat2 Cesarean (CS) for Delay in 1st stage.
Birthweight 4.2kg. PPH1.2L



Spontaneous labour 41+6. Cat2 CS Delay in 1st stage.
Birthweight 4.8kg. PPH1.2L

Identifying LGA via MRI may have changed the outcome of these cases in red...

2. Methods

As part of the currently recruiting **Mibirth** Research Study (www.mibirthstudy.com) **131** singleton participants, between **35+5 and 40+6** weeks gestation, had the following scans within 48 hours of each other (80% were same day):

1. Antenatal fetal growth USS
2. MRI (0.55Tesla)

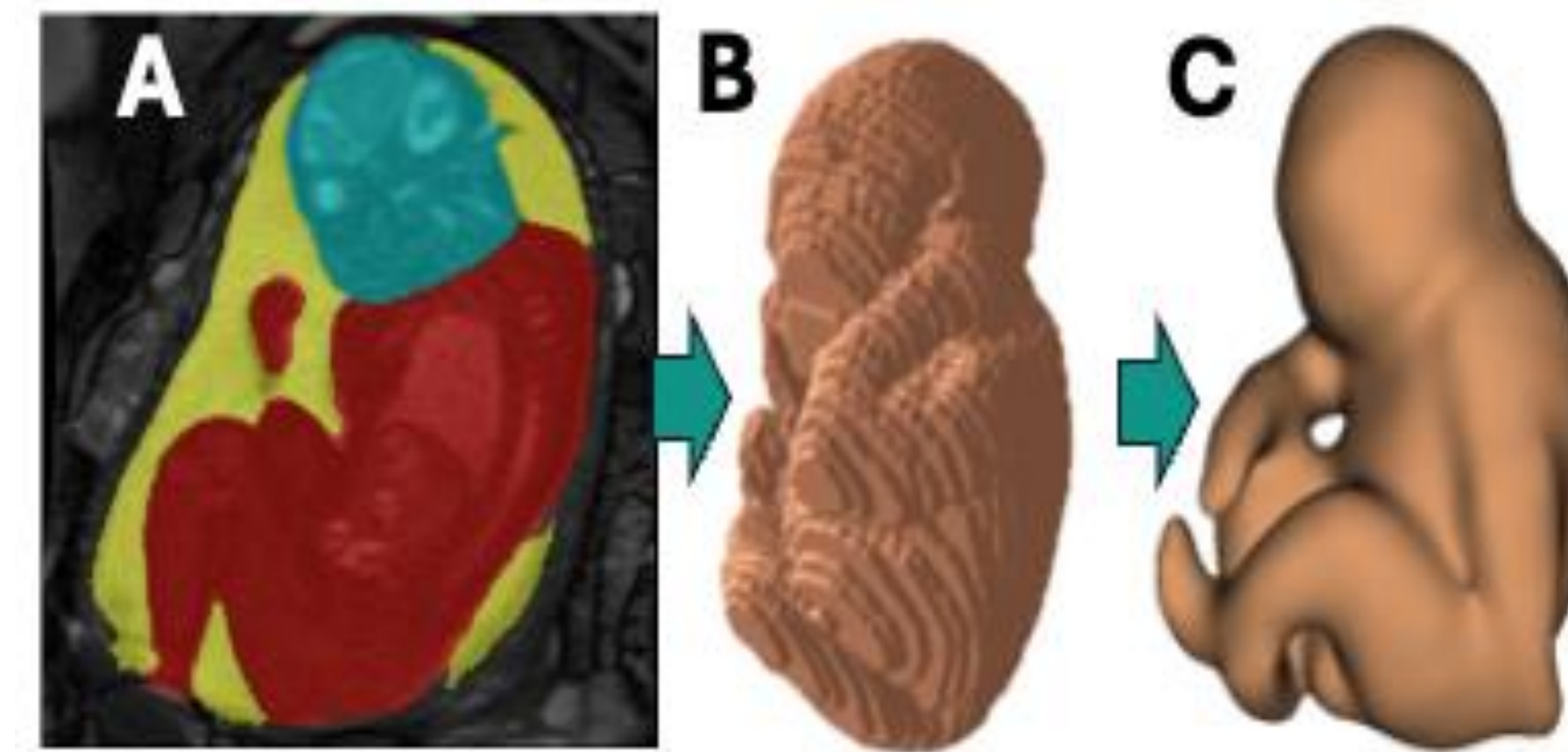
EFW calculated from both as follows:

US

- 2D fetal biometry; head circumference (HC), abdominal circumference (AC) & femur length (FL)
- **Hadlock-3** formula to calculate EFW

MRI

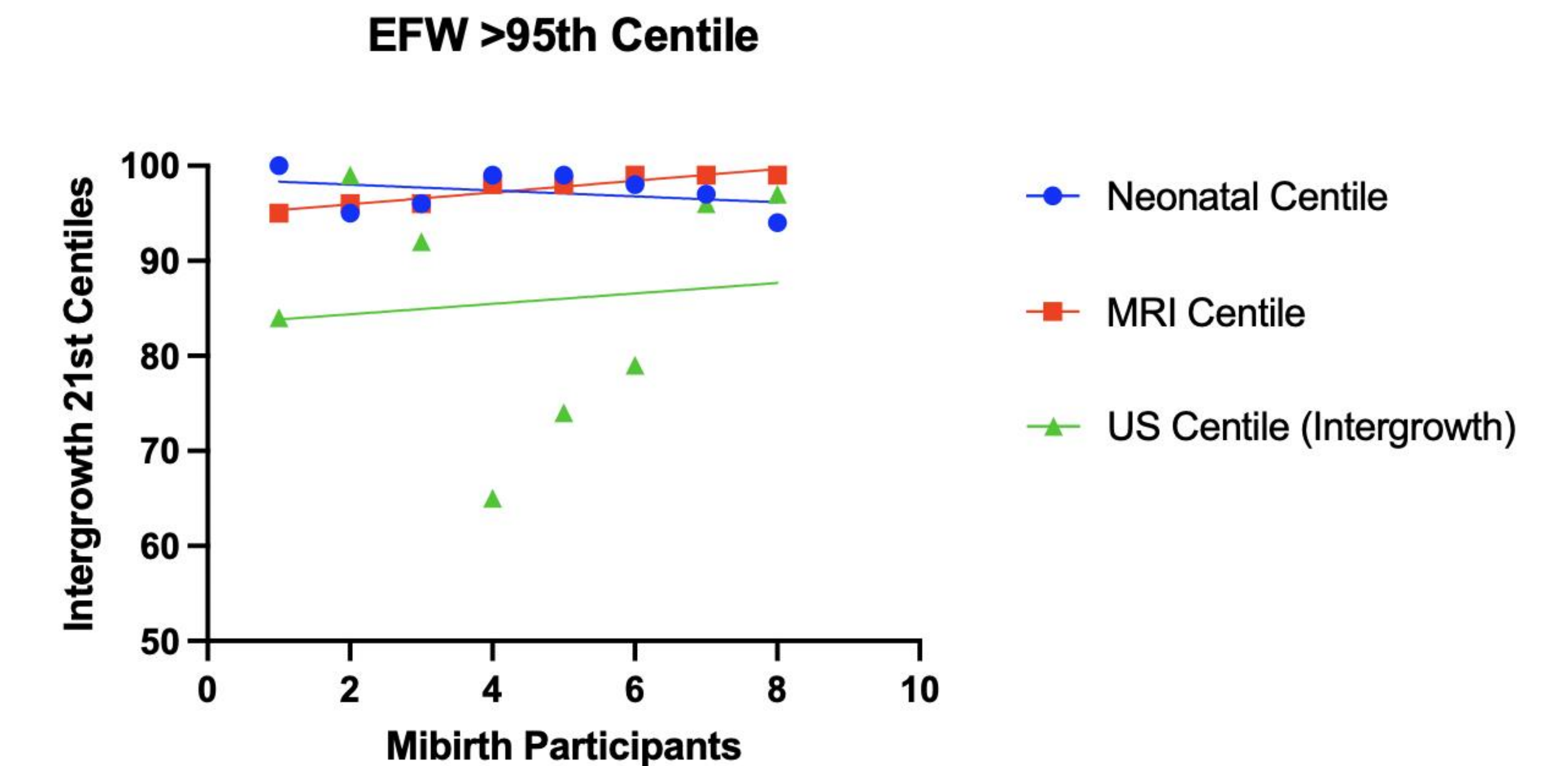
- **Deep learning model** auto segments boundaries of fetus (A).
- 3D fetal volume calculated by filling 3D reconstructions of the fetus with 3D equivalent of pixels = **voxels** (B).
- Following refinement -> **fetal volume obtained**
- Fetal volume multiplied by **density coefficient** to give EFW
- Various coefficients in literature; we used Kacem et al.
- In Mibirth Study, all this can be done real time in **<5 mins**
- All US, MRI and birth weights plotted on **Intergrowth 21st** charts to obtain centiles.



3. Results

In predicting LGA at birth (8 cases):
antenatal MRI Positive Predictive Value (PPV) = **1**
v USS PPV = **0.37**

MRI Correctly Identified every LGA fetus that was >95th centile



5. Summary

In this small cohort, we show that MRI has PPV = 1 (100%) in identifying the LGA fetus

Within the cohort it is also apparent that correct identification of 'missed LGA' may have changed the clinical outcome in 2 cases.

Further data (n=500) will be collected in **Mibirth study**.

