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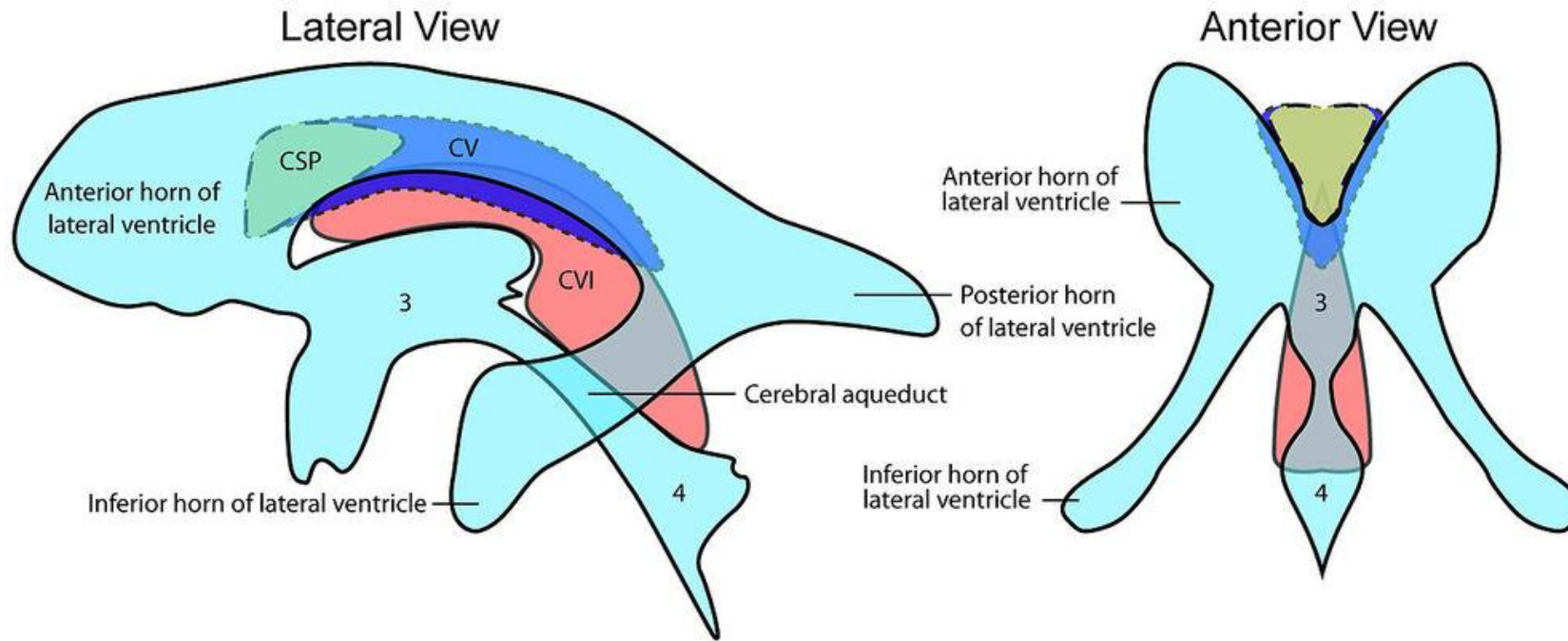
ESPR 2019

55TH ANNUAL MEETING & 41ST POST GRADUATE COURSE OF
THE EUROPEAN SOCIETY OF PAEDIATRIC RADIOLOGY

The Normal Cavum Septum Pellucidum during Fetal Development

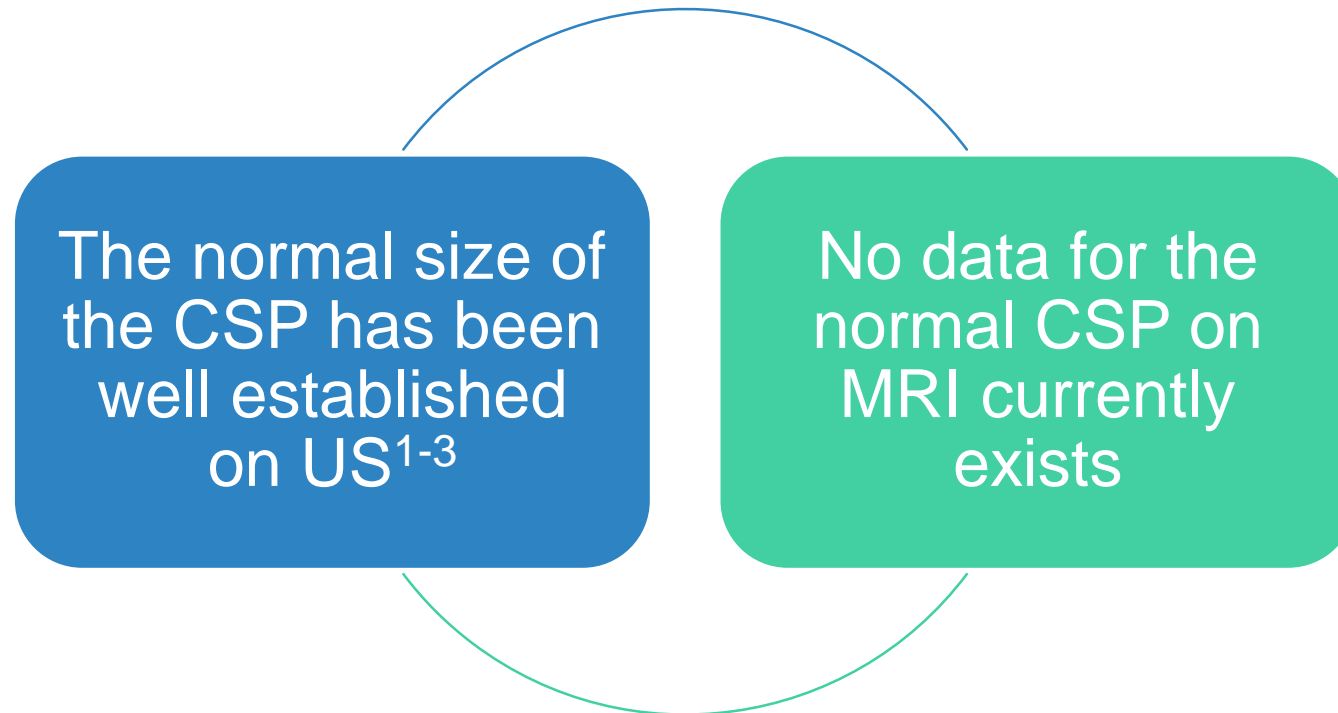
Vivien MacRow-Wood – Sheffield Medical School

Dr Elspeth Whitby - Academic Unit of Reproductive and Developmental
Medicine, University of Sheffield



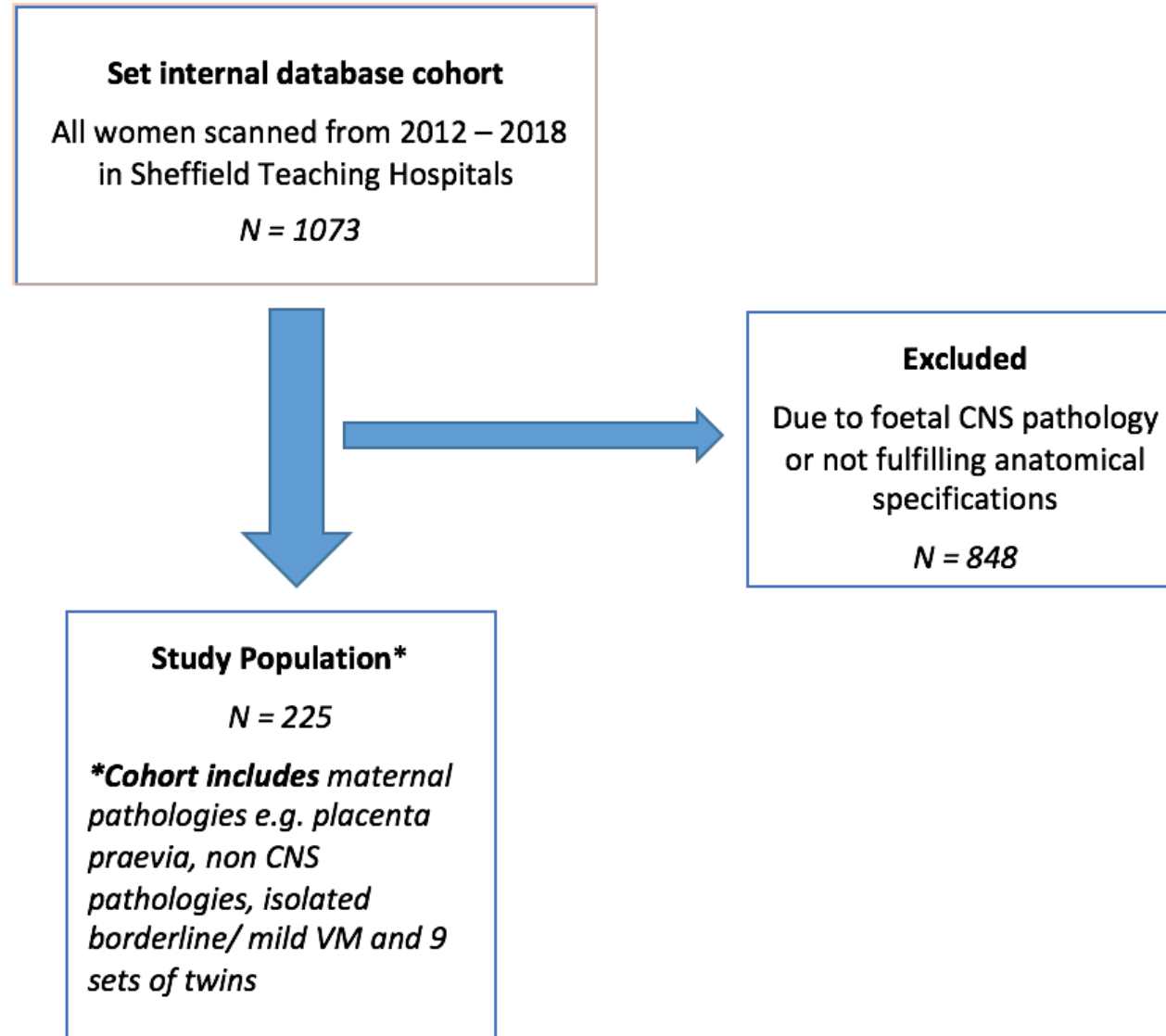
What is the CSP and why is it important?

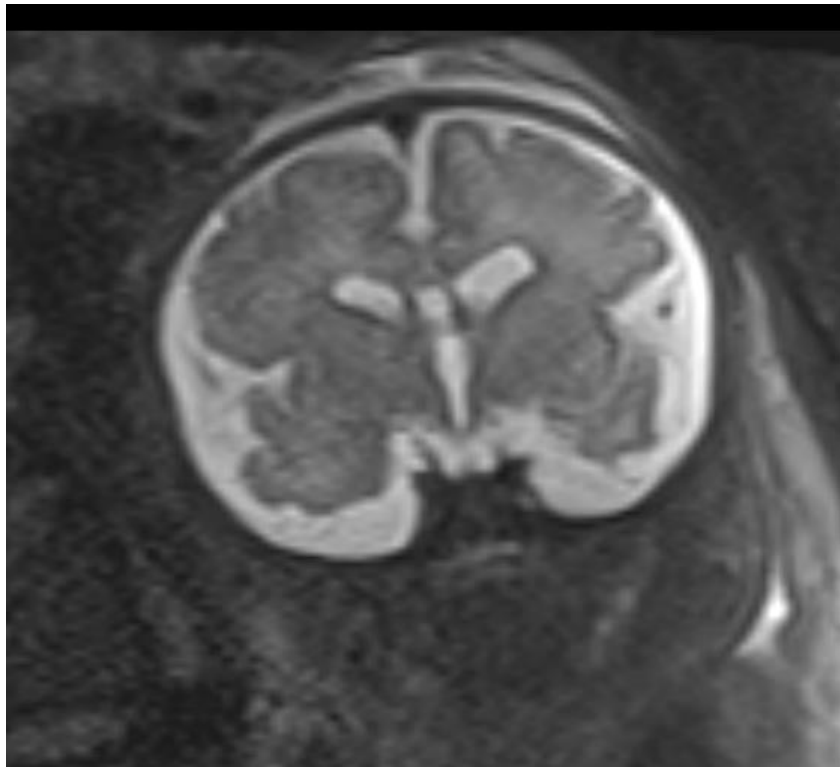
Why is the study needed?



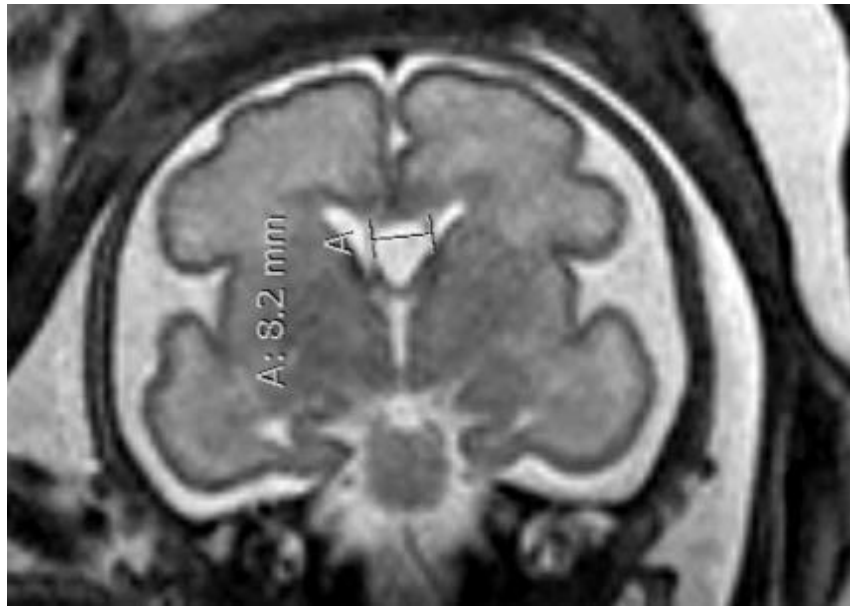
Aims

Establish	Establish a reliable and reproducible method of measuring the CSP on MRI
Define	Define the normal width and length of the CSP at different gestational ages
Determine	Determine the relationship between size and gestational age



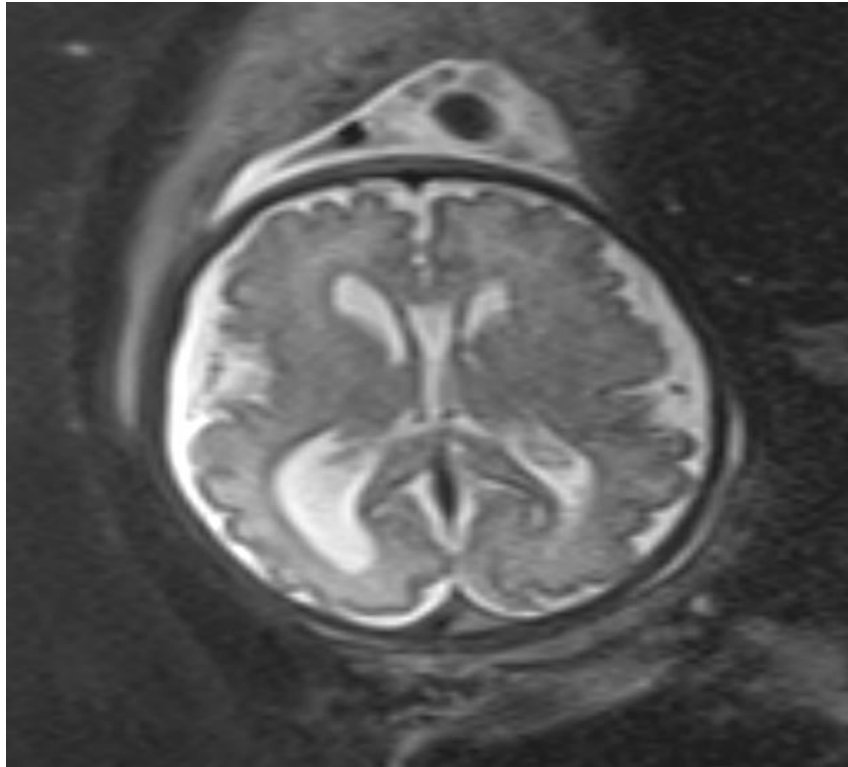


34 weeks

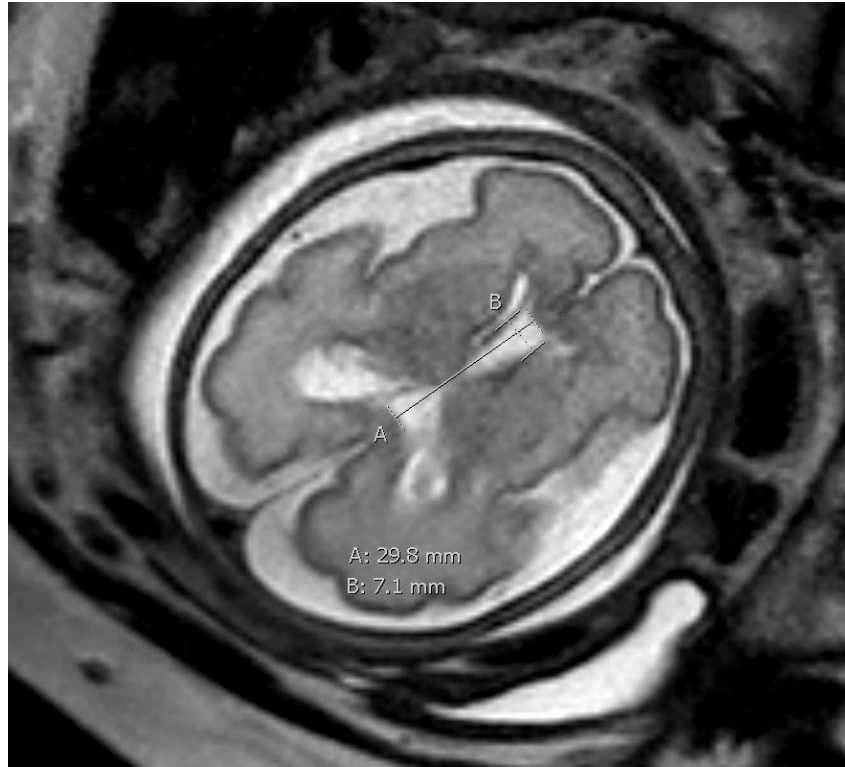


31 weeks

Specific Scan Inclusion Criteria – Coronal



34 weeks



30 weeks

Specific Scan Inclusion Criteria – Axial

Statistical Analysis

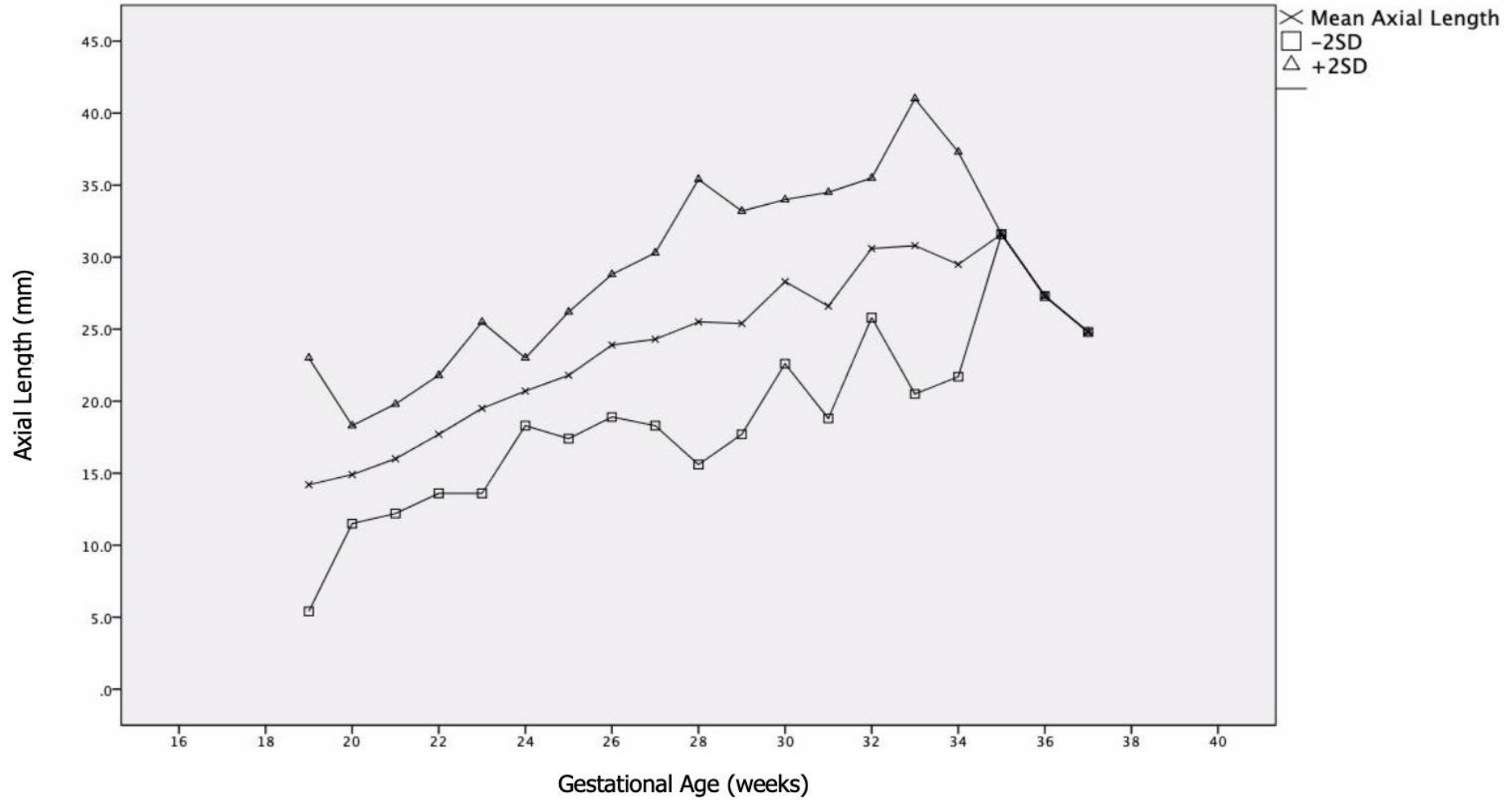
- ▶ Normal reference ranges
- ▶ Relationship with gestational age
- ▶ The Intra-Class Correlation Coefficient (ICC) was used to calculate the inter rater reliability and intra rater reliability of the measurements

Study Population

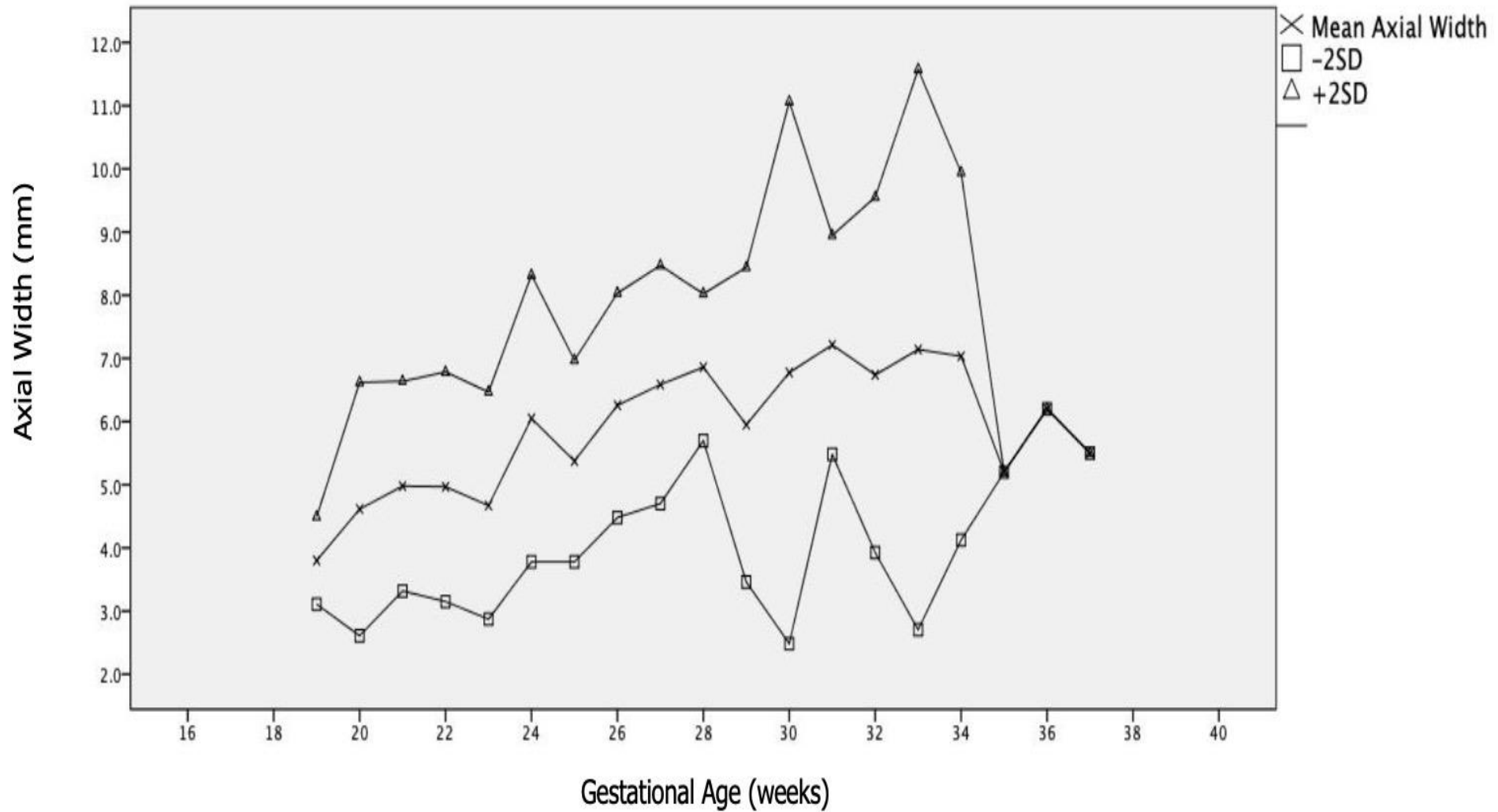
- ▶ 225 total participants
 - ▶ 187 coronal width measurements
 - ▶ 165 axial width measurements
 - ▶ 166 axial length measurements
- ▶ Gestational ages
 - ▶ 19 - 38 weeks (mean \pm 1SD
25.26 \pm 4.54 weeks)

Principle Findings

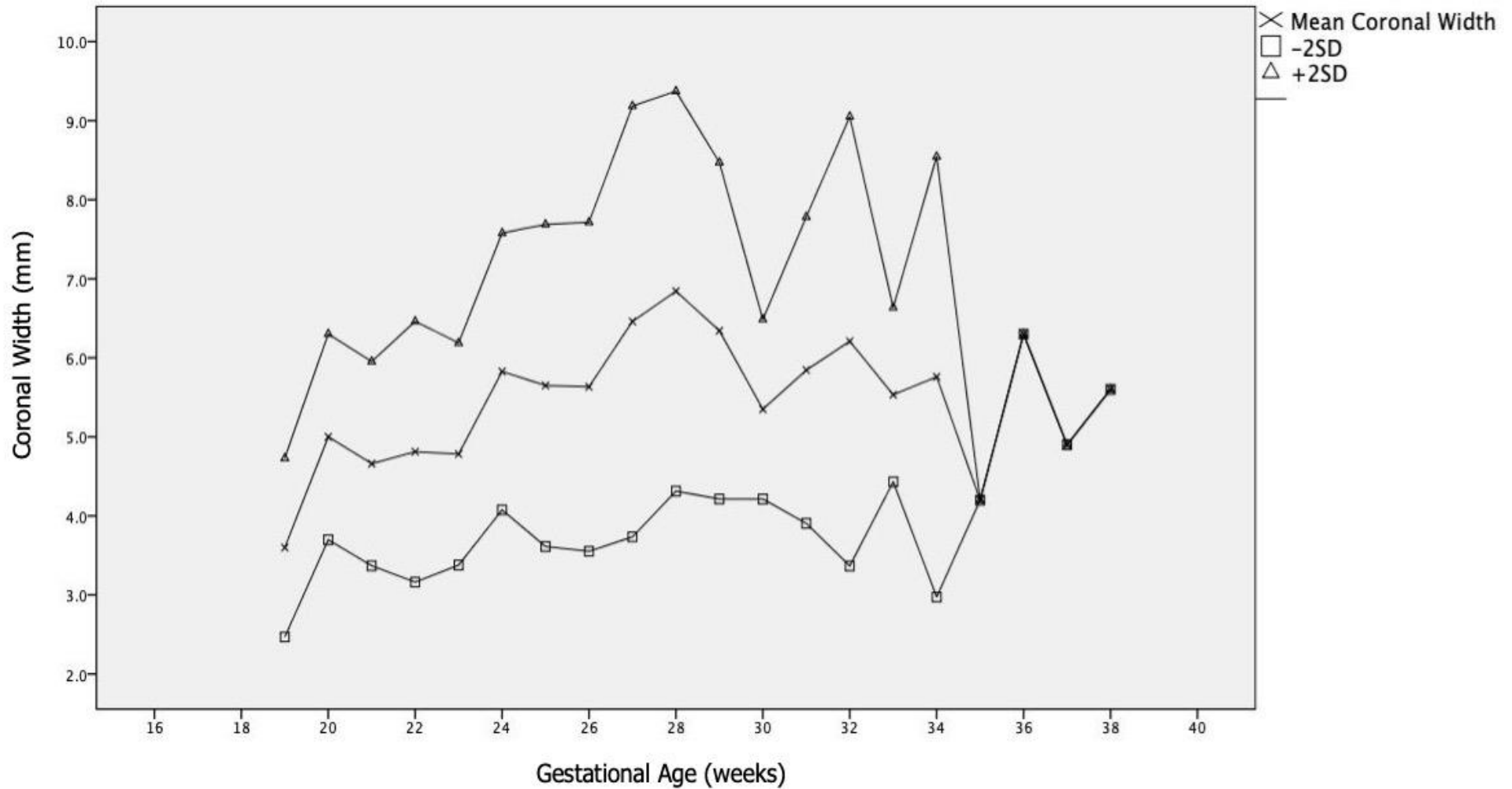
This study is the first to provide CSP fetal MRI biometric data for the CSP width and length



Axial Length



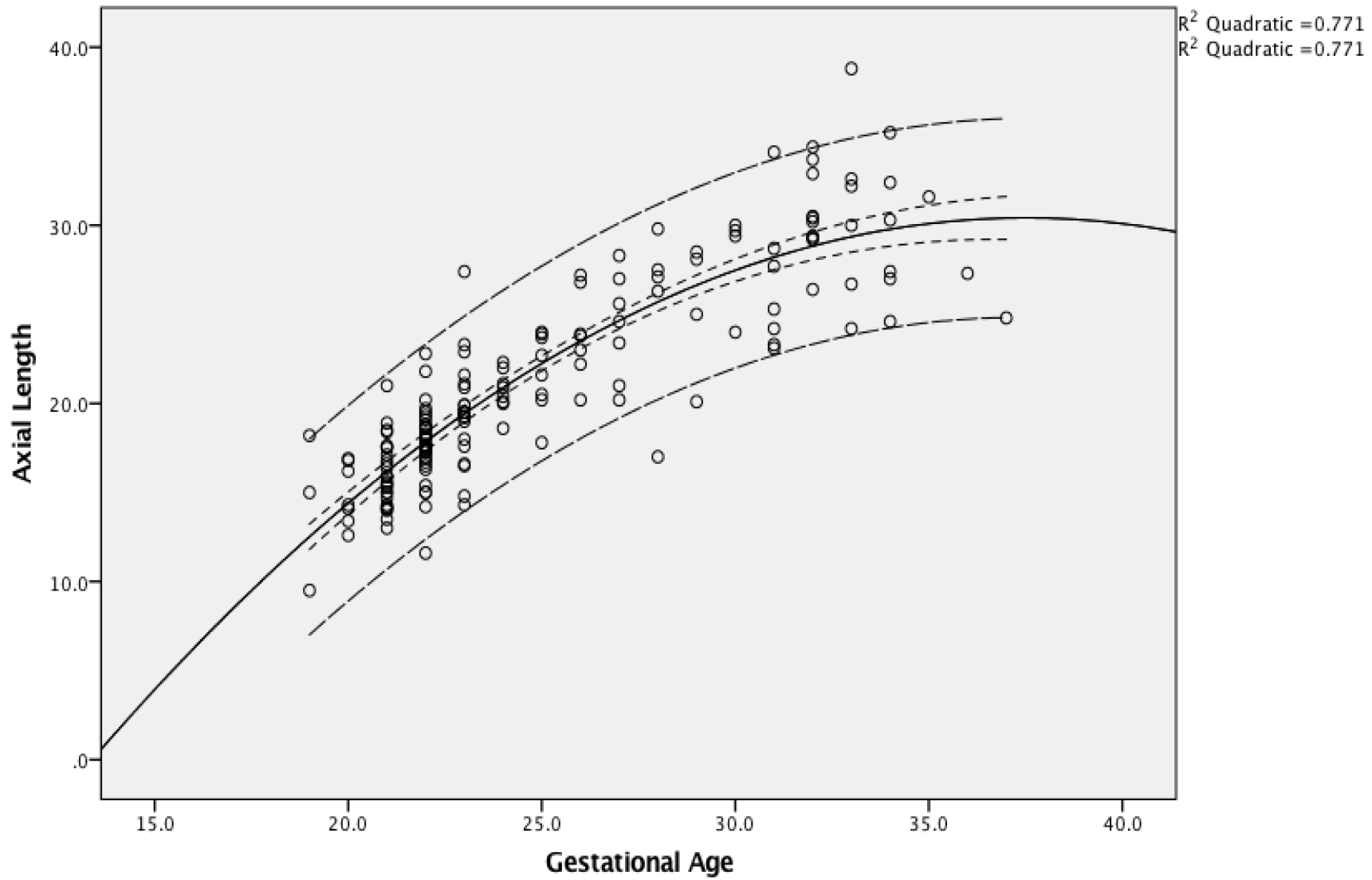
Axial Width



Coronal Width

Principle Findings

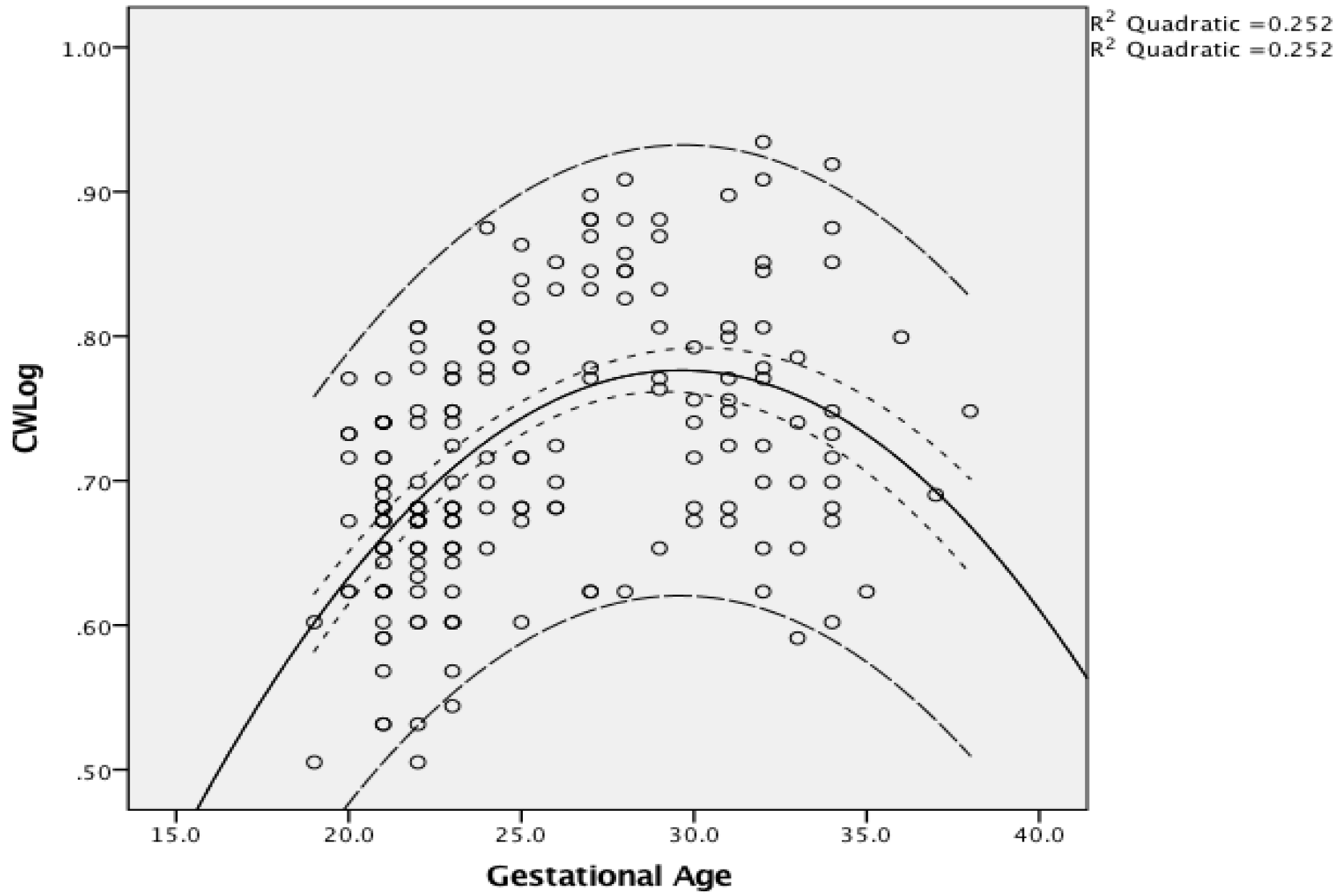
There is a strong, statistically significant relationship between the length of the CSP and gestational age



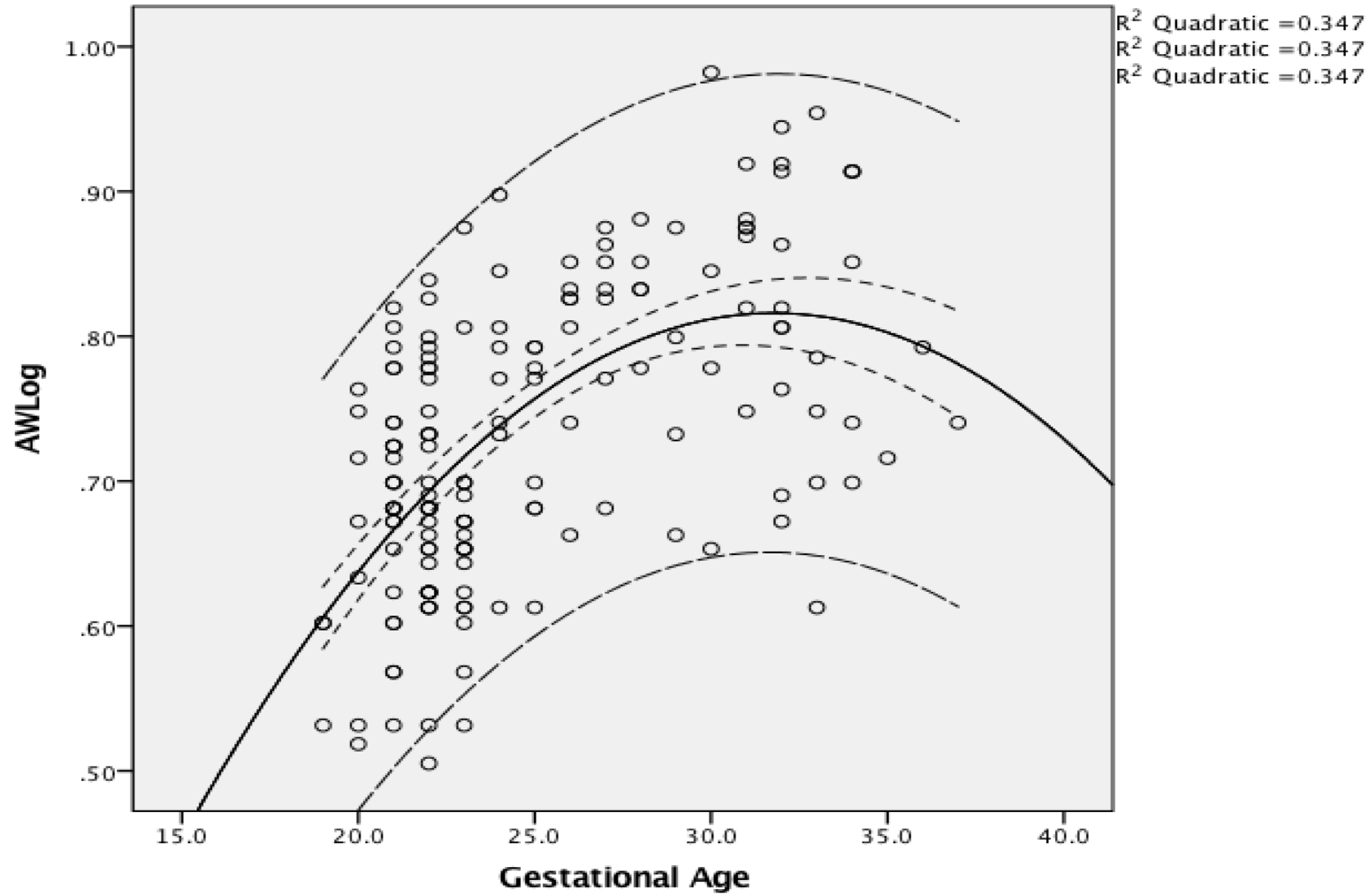
Axial Length

Principle Findings

We did not find a strong relationship between the width of the CSP and gestational age



Coronal Width



Axial Width

Principle Findings

The standardised method proposed by this study was found to be accurate and highly reproducible by separate clinicians

Interrater and Intrarater Reliability

▶ Inter Rater Reliability

- ▶ **Excellent** for Axial Length ((**ICC = 0.988** [95% CI of 0.976 to 0.994, $p < 0.001$]) and Coronal Width (**ICC = 0.965** [95% CI of 0.925 to 0.984, $p < 0.001$])).
- ▶ **Moderate-good** reliability for Axial Width (**ICC = 0.791** [95% CI of 0.515 to 0.906, $p < 0.001$])).

▶ Intra Rater Reliability

- ▶ **Excellent** reliability for Axial Length (**ICC = 0.978** [95% CI of 0.954 to 0.989, $p < 0.001$]) and Coronal Width (**ICC = 0.945** [95% CI of 0.889 to 0.973, $p < 0.001$])).
- ▶ **Moderate-good** reliability for Axial Width (**ICC = 0.715** [95% CI of 0.486 to 0.853, $p < 0.001$])).

Discussion

- ▶ Comparison with available literature
 - ▶ CSP Length ⁴
 - ▶ CSP Width ¹⁻³
- ▶ Clinical Implications
 - ▶ The standardised approach will ensure the CSP is measured consistently between practitioners.
- ▶ Research Implications
 - ▶ These measurements can be used as a benchmark for normal as opposed to using the normal US measurements as proxy.
 - ▶ A future study could determine the relationship between the length of the CSP and the length of the corpus callosum through the various gestational ages.



Thank You

References

1. Jou HJ, Shyu MK, Wu SC, Chen SM, Su CH, Hsieh FJ. Ultrasound measurement of the fetal cavum septi pellucidi. *Ultrasound Obstet Gynecol.* 1998;12(6):419-421. doi:10.1046/j.1469-0705.1998.12060419.x
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3. Falco P, Gabrielli S, Visentin A, Perolo A, Pilu G, Bovicelli L. Transabdominal sonography of the cavum septum pellucidum in normal fetuses in the second and third trimesters of pregnancy. *Ultrasound Obstet Gynecol.* 2000;16(6):549-553. doi:10.1046/j.1469-0705.2000.00244.x
4. Serhatlioglu S, Kocakoc E, Kiris A, Sapmaz E, Boztosun Y, Bozgeyik Z. Sonographic measurement of the fetal cerebellum, cisterna magna, and cavum septum pellucidum in normal fetuses in the second and third trimesters of pregnancy. *J Clin Ultrasound.* 2003;31(4):194-200. doi:10.1002/jcu.10163