

Cervical length assessment by magnetic resonance imaging during pregnancy: Correlation with transvaginal ultrasound measurement

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Objective

To assess the correlation between cervical length (CL) measurements obtained via magnetic resonance imaging (MRI) and transvaginal ultrasound (TVUS) and the accuracy of CL obtained by MRI in diagnosing a short cervix, using TVUS as the gold standard.

Methods

Retrospective cohort study of pregnancies referred to our center for consultation between January 2022 and December 2024 who underwent same-day pre-consultation MRI and TVUS. We assessed normality visually and using the Shapiro-Wilks test. We estimated the CL measurement correlation between MRI and TVUS using Spearman’s rank correlation coefficient, including a stratified analysis by pertinent clinical variables. Bland-Altman analysis evaluated the agreement between the two methods. Finally, we calculated the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of CL by MRI at varying cut-offs to diagnose a short cervix, defined as CL <25 mm, by TVUS.

Results

We included 100 patients. CL measurements were not normally distributed. Spearman’s rank correlation between MRI and TVUS measurements was strong (0.8, $p = <0.001$) and remained significant when stratified by pertinent clinical variables (Table 1). According to Bland-Altman analysis, the mean difference in CL between MRI and TVUS was -0.97 mm (95% limit of agreement = -13.67 mm to 11.73 mm). The sensitivity, specificity, PPV, and NPV of CL ≤ 25 mm to predict a short cervix were 100%, 96%, 75%, and 100%, respectively (Figure 1).

Conclusion
Cervical length measurements by MRI strongly correlate and have minimal disagreement with those ascertained by transvaginal ultrasound

Parameter (n)	r	p
Body mass index		
< 30 kg/m ² (38)	0.850	<0.01
≥ 30 kg/m ² (19)	0.837	<0.01
Gestational age (weeks)		
13-16 (21)	0.421	0.028
17-24 (56)	0.794	<0.01
25 – 35 (23)	0.868	<0.01
Pregnancy type		
Singleton (80)	0.756	<0.01
Twins (20)	0.860	<0.01
Cervical length by TVUS		
<30mm (20)	0.711	<0.01
≥30mm (80)	0.592	<0.01

Table 1. Cervical length measurement correlation between transvaginal ultrasound and magnetic resonance imaging stratified by baseline characteristics

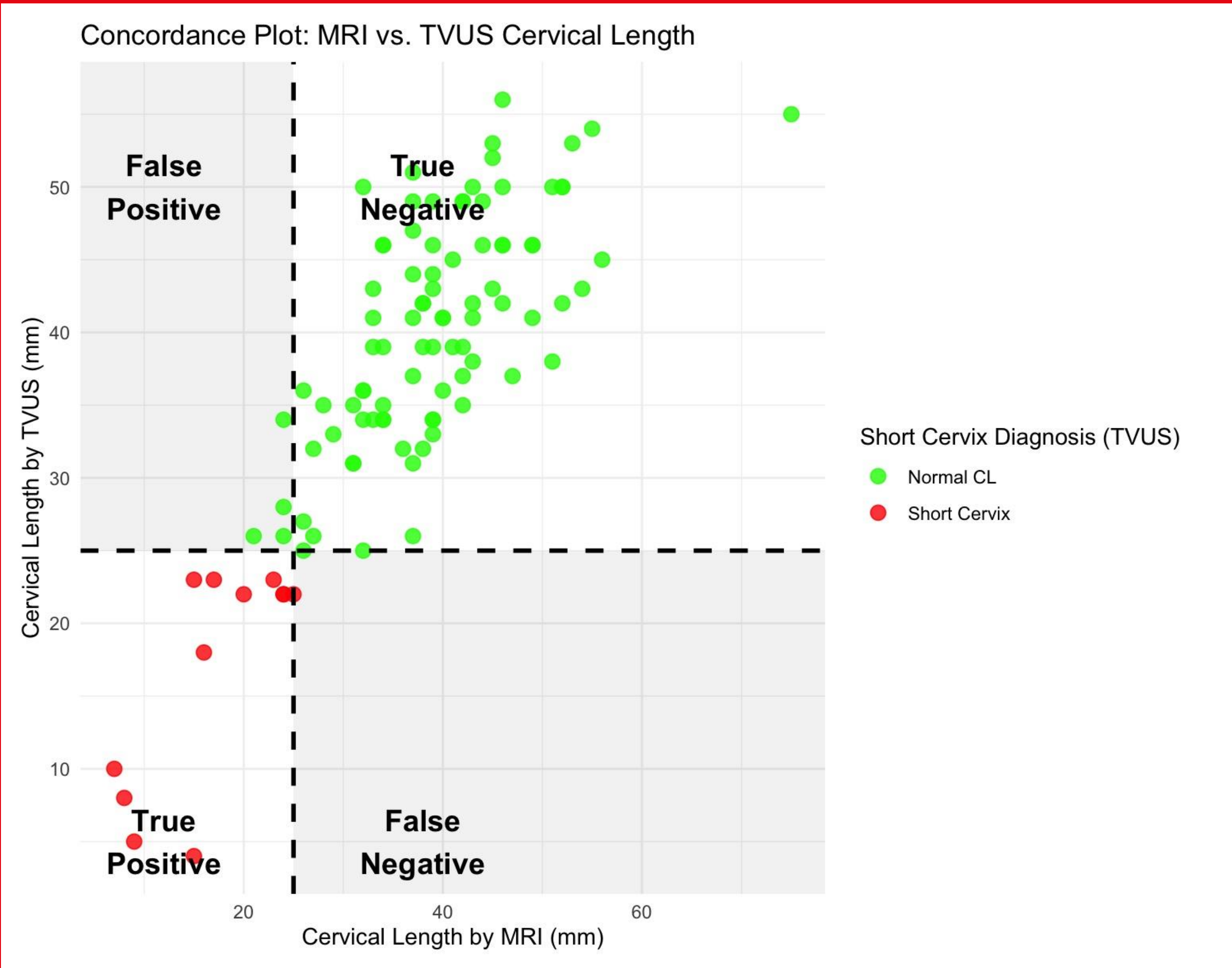


Figure 1. Cervical length measurements by magnetic resonance imaging stratified by short cervix status according to transvaginal ultrasound.