**Introduction**

Preterm birth (PTB) remains a significant global health challenge. Attempts to predict preterm birth in the first trimester using cervical length have been largely unsuccessful. However, the cervical consistency index (CCI) has shown promise across various clinical scenarios.

**Objective**

This study aims to assess CCI's performance in predicting preterm birth during the first trimester of pregnancy.

**Study design**

In this prospective cohort study, focused exclusively on research, women with singleton pregnancies, both with and without a history of spontaneous preterm birth (sPTB), were included. The primary outcome was sPTB before 37 weeks, with a secondary outcome of sPTB before 34 weeks. CCI measurements were taken between 11+0 and 13+6 weeks of gestation. Receiver operating characteristics (ROC) curves were utilized to determine optimal cut-offs at the 5th, 10th, and 15th percentiles. Intraobserver and interobserver agreements were assessed using the intraclass correlation coefficient (ICC).

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**Results**

Among the 667 patients analyzed, the rates of sPTB before 37 and 34 weeks were 9.2% (61/667) and 1.8% (12/667), respectively. The detection rates (DR) for CCI predicting PTB before 37 and 34 weeks were 19.7% (12/61) and 33.3% (4/12). Negative predictive values were 91.8% (546/595) and 98.7% (588/596), while the areas under the curve (AUC) for sPTB before 37 and 34 weeks were 0.62 (95% CI: 0.54-0.69) and 0.80 (95% CI: 0.71-0.89), respectively. Intraobserver ICC was 0.862 (95% CI, 0.769-0.920), and interobserver ICC was 0.833 (95% CI, 0.722-0.902).

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**Conclusions**

This study suggests that utilizing CCI in the first trimester of pregnancy could serve as a valuable tool for predicting preterm birth before 34 weeks of gestation, demonstrating robust intraobserver and interobserver reliability.