

Poster Number EP 16.41

Cervical Consistency Index (CCI) in the first trimester as a predictor of delivery before 34 weeks: a case-control study



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Objective: To calculate the operational efficiency of the ICC as a predictor of delivery before 34 weeks measured in the first trimester in single pregnancies.

Methods: Ninety-five patients were classified in two groups: delivery before and after 34 weeks (Case and control). Main variables were gestational age at birth, CCI, cervical length (CL), and comorbidities. CCI measurement was performed by already validated personnel. The calculation of the receiver operating variables for each test is performed with a binary table. Analyses include ROC curves, establishing their diagnostic accuracy for each test (CCI-CL), the area under the curve (AUC) and the 95% of confidence interval (CI) were established. The association between the decrease in CCI and CL for predicting delivery before 34 weeks was performed through the Odds Ratio (OR).

Technique: The dynamic properties of the cervix and the cervical consistency index (CCI), were described previously by Parra-Saavedra et al as a new ultrasonographic tool¹. Principal steps are described in Figures 1-4. Cervical softness is calculated by dividing the anteroposterior diameter of the cervix, after applying pressure with the transvaginal probe until maximum deformation is achieved, by the anteroposterior diameter at rest. When the tissue is softer, the increasing difference between these two measurements results in lower CCI values; therefore, CCI is directly proportional to cervical hardness². The authors showed that the cervix can lose up to 40% of its consistency without evidence of changes in cervical length, and the advantage of measuring CCI is given by its predictable behavior demonstrated by linear regression.

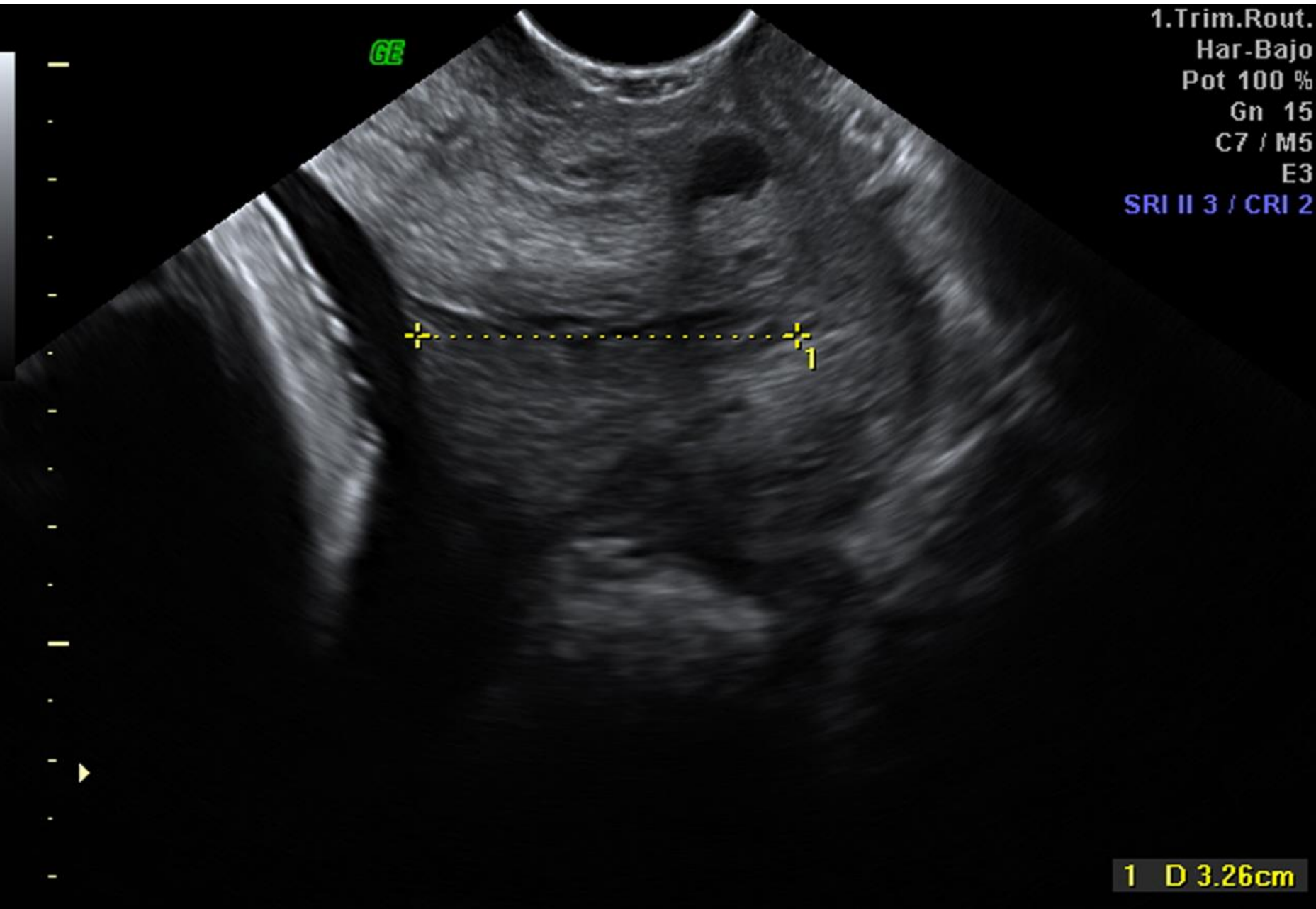


FIGURE 1 : STEP ONE

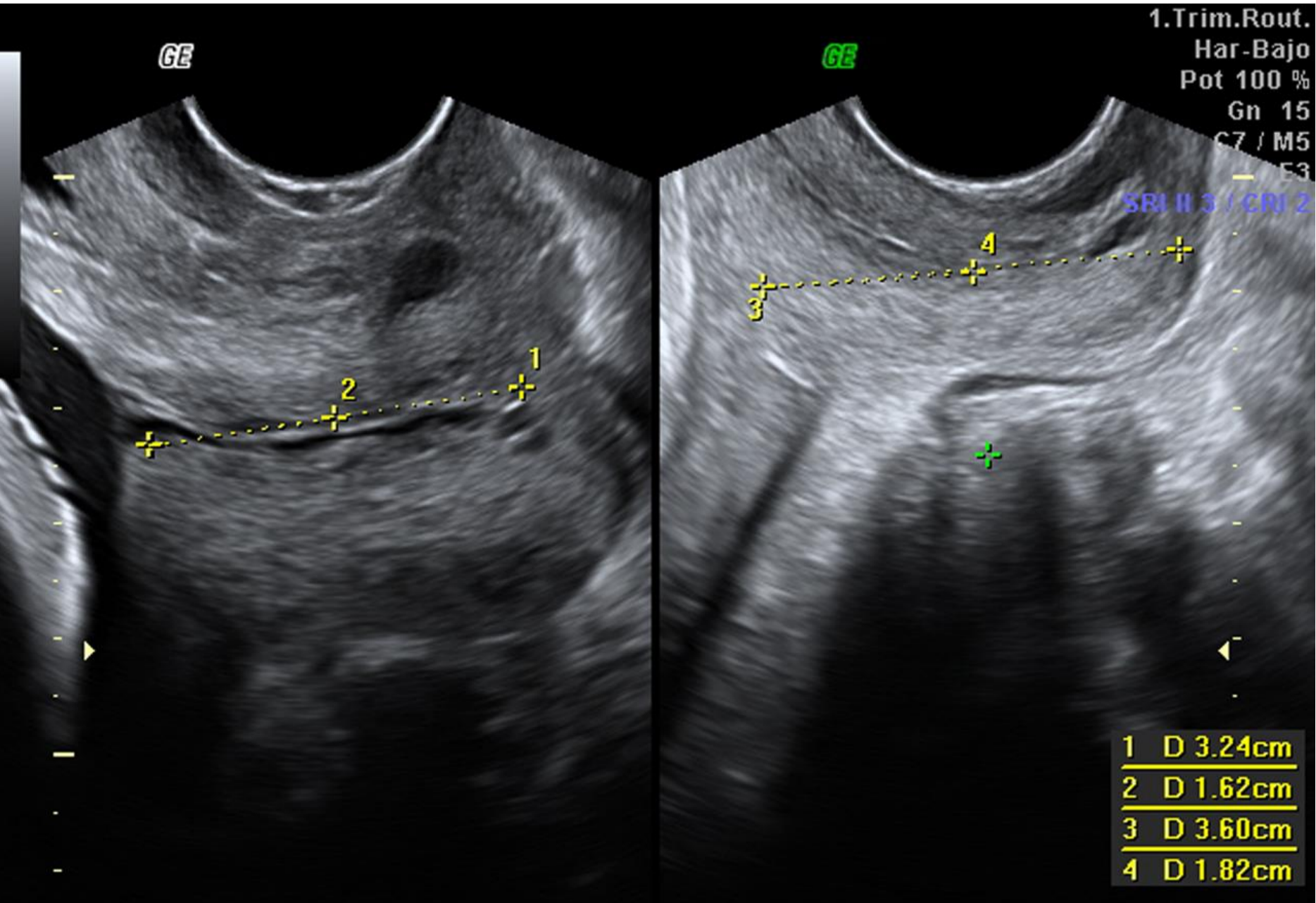


FIGURE 2 : STEP TWO

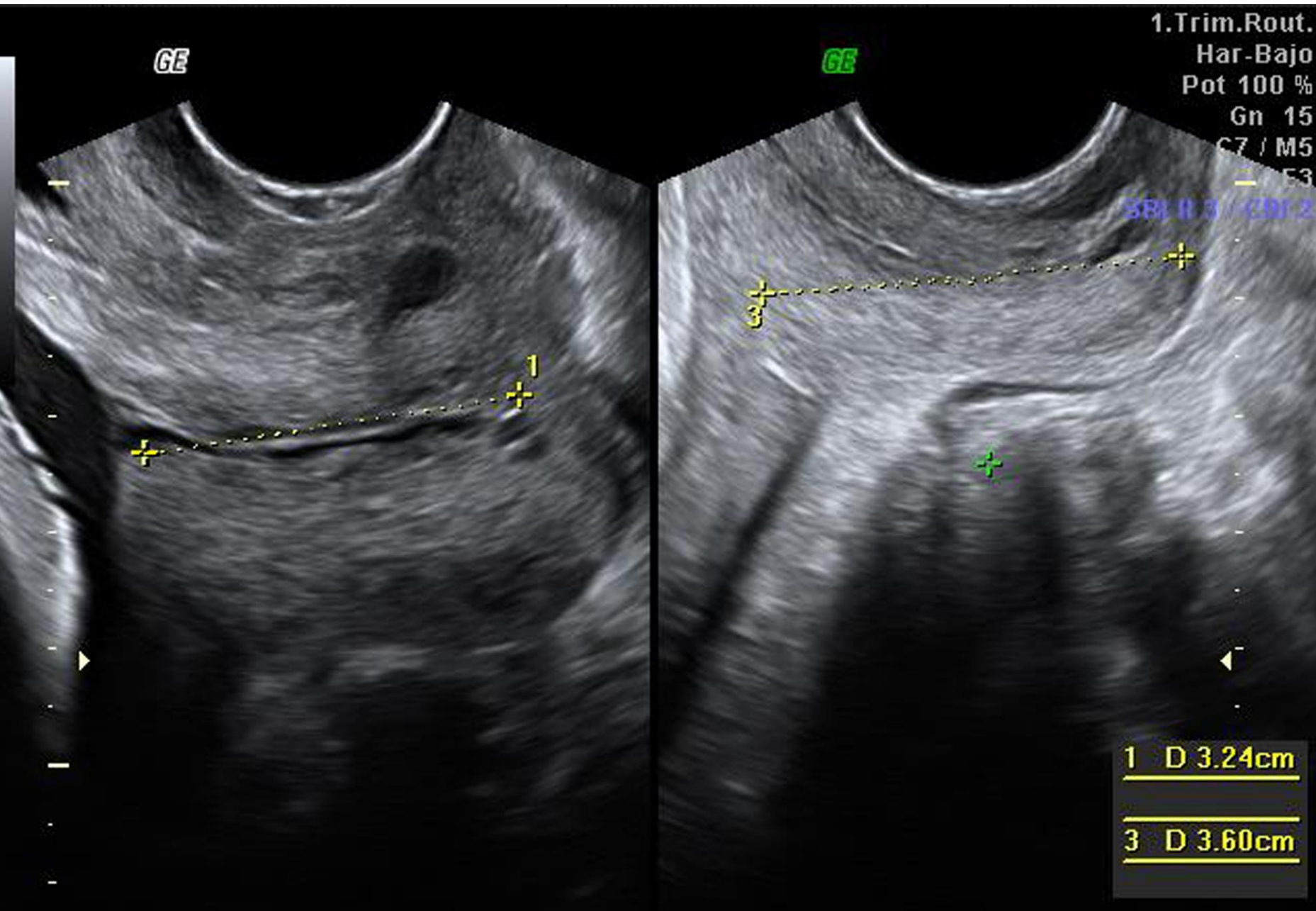


FIGURE 3 : STEP THREE

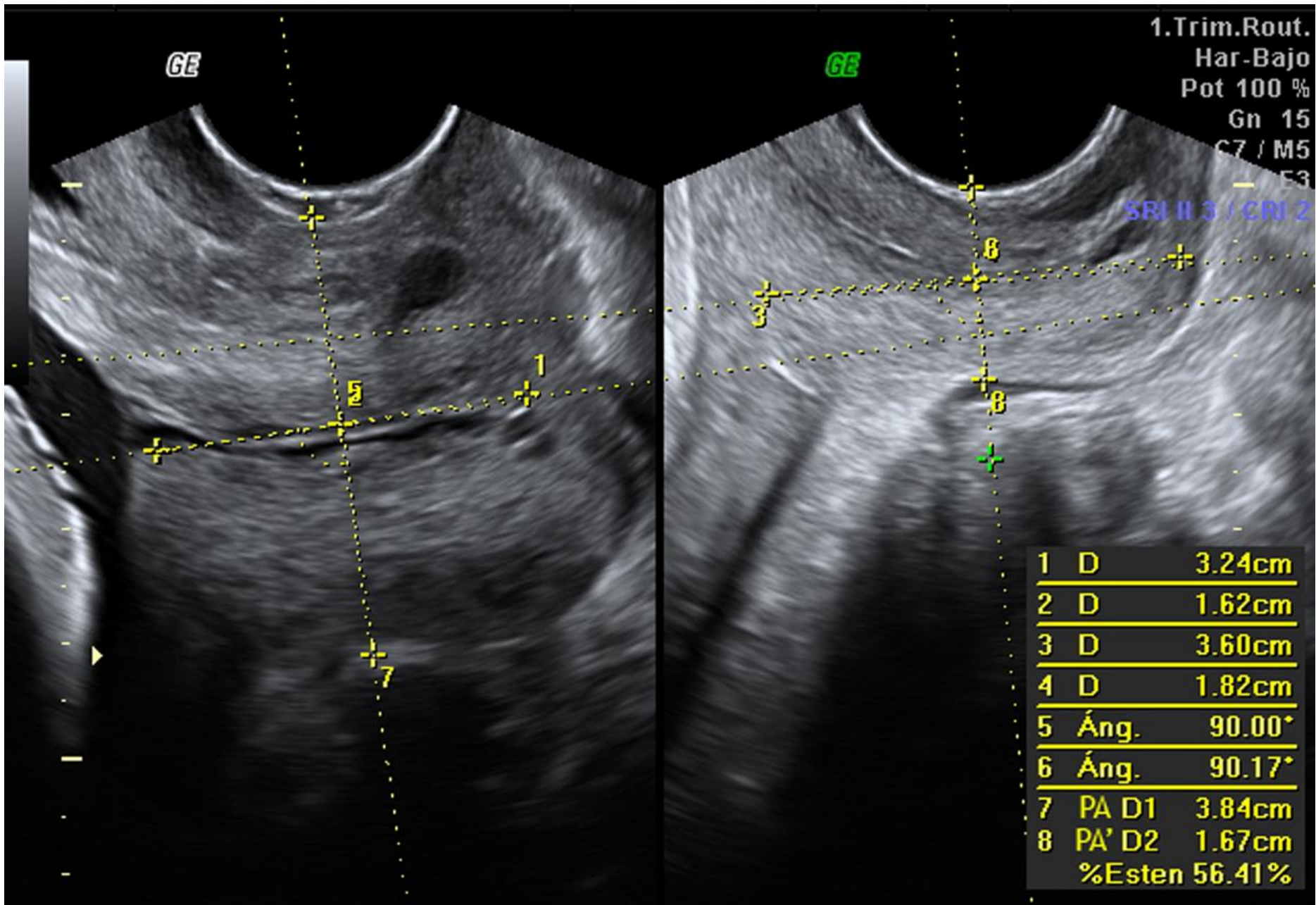


FIGURE 4 : STEP FOUR

Results :

- When comparing CCI in patients with and without delivery before 34 weeks, the mean CCI was 76.8±2.4% vs 86.8±7.3% respectively.
- For delivery before 34 weeks CCI, the best value in the ROC curve was 77.4%. These results showed significant differences (p<0.001).
- The Odds Ratio was estimated at 8.83 (95% CI:2.3-33.7), p≤ 0.001. Positive likelihood ratio 6.22.
- The probability of premature birth before 34 weeks is eight times higher for patients with a CCI <77%.
- Patients classified as at risk will require monitoring

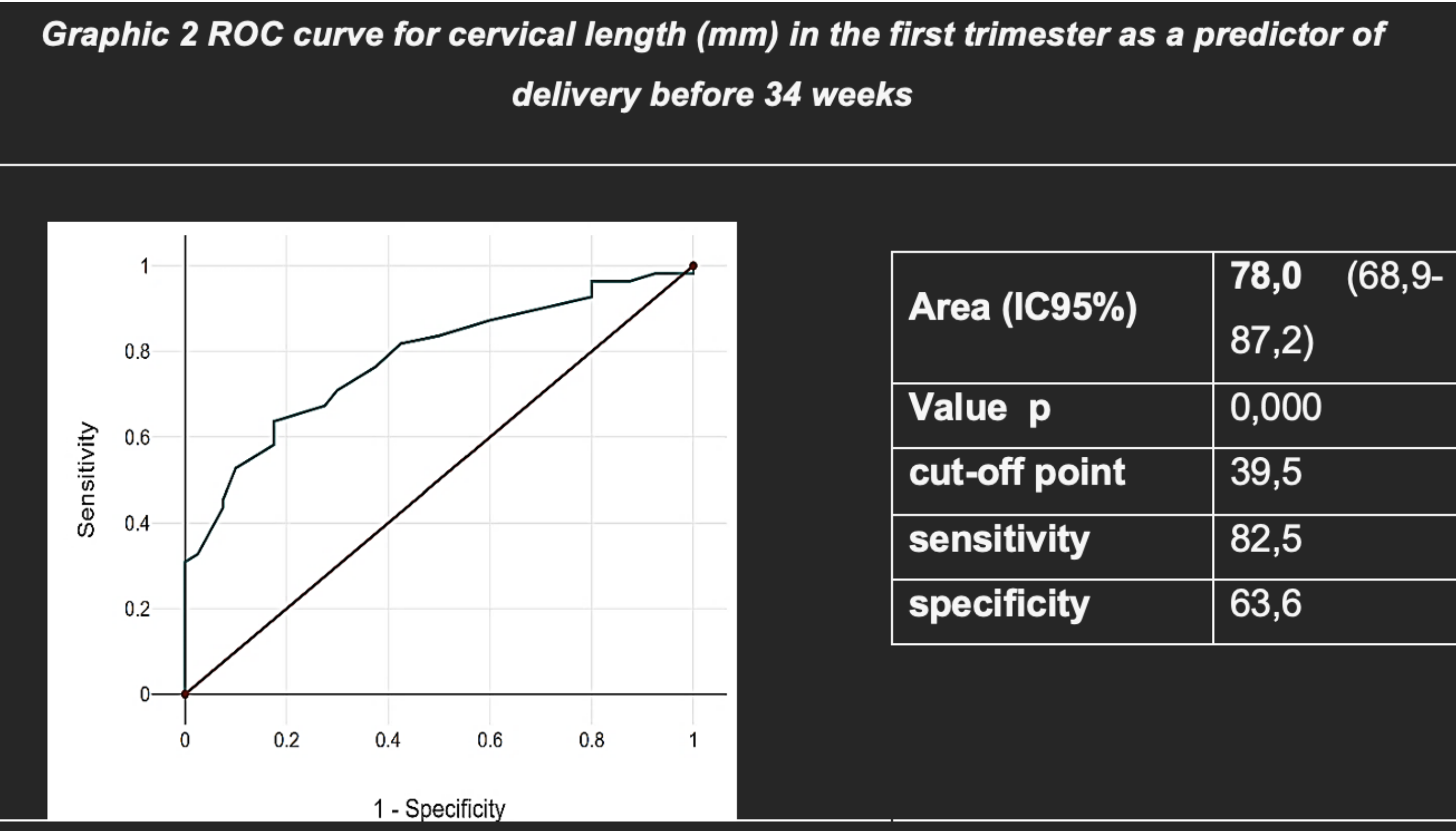
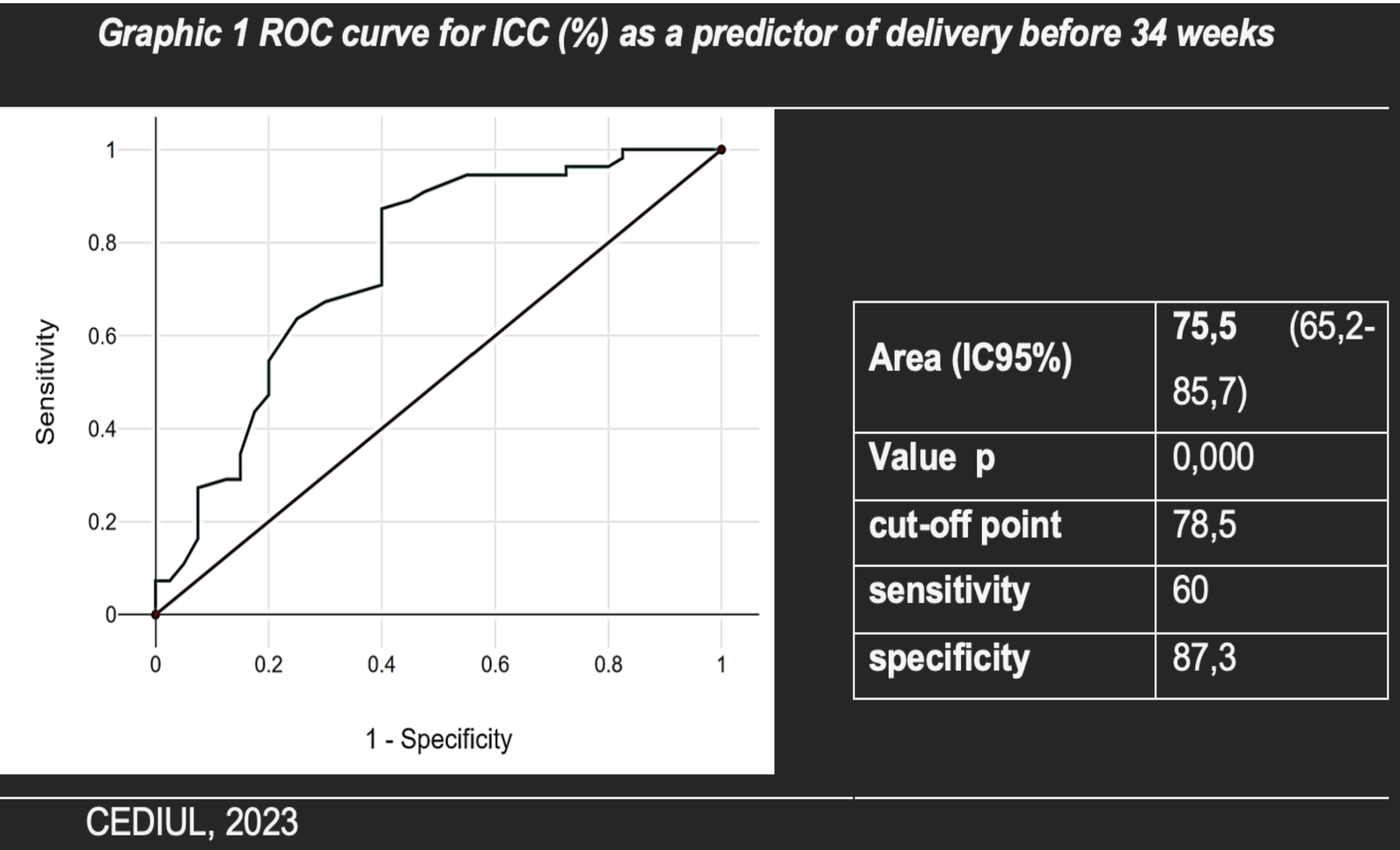


Figure 5 Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value of each of the tests Individually and as a measure of Association for predicting delivery before 34 weeks

		Delivery before <34 weeks		Chi2	P	Sensitivity	Specificity
		%Yes	%No				
cervical length <39,5mm (a)	Yes (n=53)	62,3*	37,7	19,98	0,000	82,5	63,6
	No (n=42)	16,7	83,3**				
ICC < a 78,5% (b)	Yes (n=31)	77,4*	22,6	23,5	0,000	60,0	87,3
	No (n=64)	25,0	75,0**				
a y b	Yes (n=23)	78,3*	21,7	16,3	0,000	45,0	90,9
	No (n=72)	30,6	69,4**				

CEDIUL, 2023

* Positive Predictive Value; ** Negative Predictive Value

Conclusions :

- CCI measured in the first trimester as a predictor of delivery before 34 weeks has a strong specificity and positive predictive value, giving the test diagnostic power
- It's low sensitivity makes it unsuitable for screening.
- CL may have better sensitivity, but low specificity, overestimating the risk.
- There is no statistically significant difference in inferiority when comparing CCI vs CL for predicting delivery before week 34 when measured in the first trimester

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