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Maternal ophthalmic artery Doppler as a marker of cerebral autoregulation in hypertensive disorders of pregnancy at 35–37 weeks
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Introduction

Preeclampsia (PE) remains a major cause of maternal and perinatal morbidity. Identification of women at risk of imminent PE in late pregnancy may improve surveillance and management. Ophthalmic artery Doppler reflects maternal cerebral hemodynamics and may serve as a predictive marker.

Objective

To evaluate the performance of maternal ophthalmic artery Doppler at 35–37 weeks for predicting PE within 3 weeks of assessment.

Methods

Prospective observational study
230 singleton pregnancies at 35+0–36+6 weeks
Maternal ophthalmic artery Doppler performed using a standardized transorbital technique
Parameters assessed:
PSV1
PSV2
PI
PSV2/PSV1 ratio
Outcome: Development of PE within 3 weeks
ROC analysis performed

Results

Total pregnancies: 230
Developed PE: 26 (11.3%)
Normotensive: 204 (88.7%)
Baseline maternal characteristics were comparable between groups. Women who subsequently developed preeclampsia demonstrated significant differences in ophthalmic artery Doppler parameters compared with normotensive pregnancies, suggesting altered cerebral vascular impedance. At a fixed 10% false-positive rate, detection rates for prediction of preeclampsia within three weeks were 40% for PSV1, 45% for PSV2, 50% for PI and 66% for the PSV2/PSV1 ratio. The PSV2/PSV1 ratio showed the highest discriminatory performance with an area under the ROC curve of 0.76.

Key Finding

The PSV2/PSV1 ratio demonstrated the highest predictive performance for PE occurring within 3 weeks, achieving: Detection Rate: 66%
AUC: 0.76

Conclusion

Maternal ophthalmic artery Doppler at 35–37 weeks shows moderate ability to predict imminent preeclampsia. The PSV2/PSV1 ratio was the best-performing parameter and may be a useful adjunct to third-trimester risk assessment.

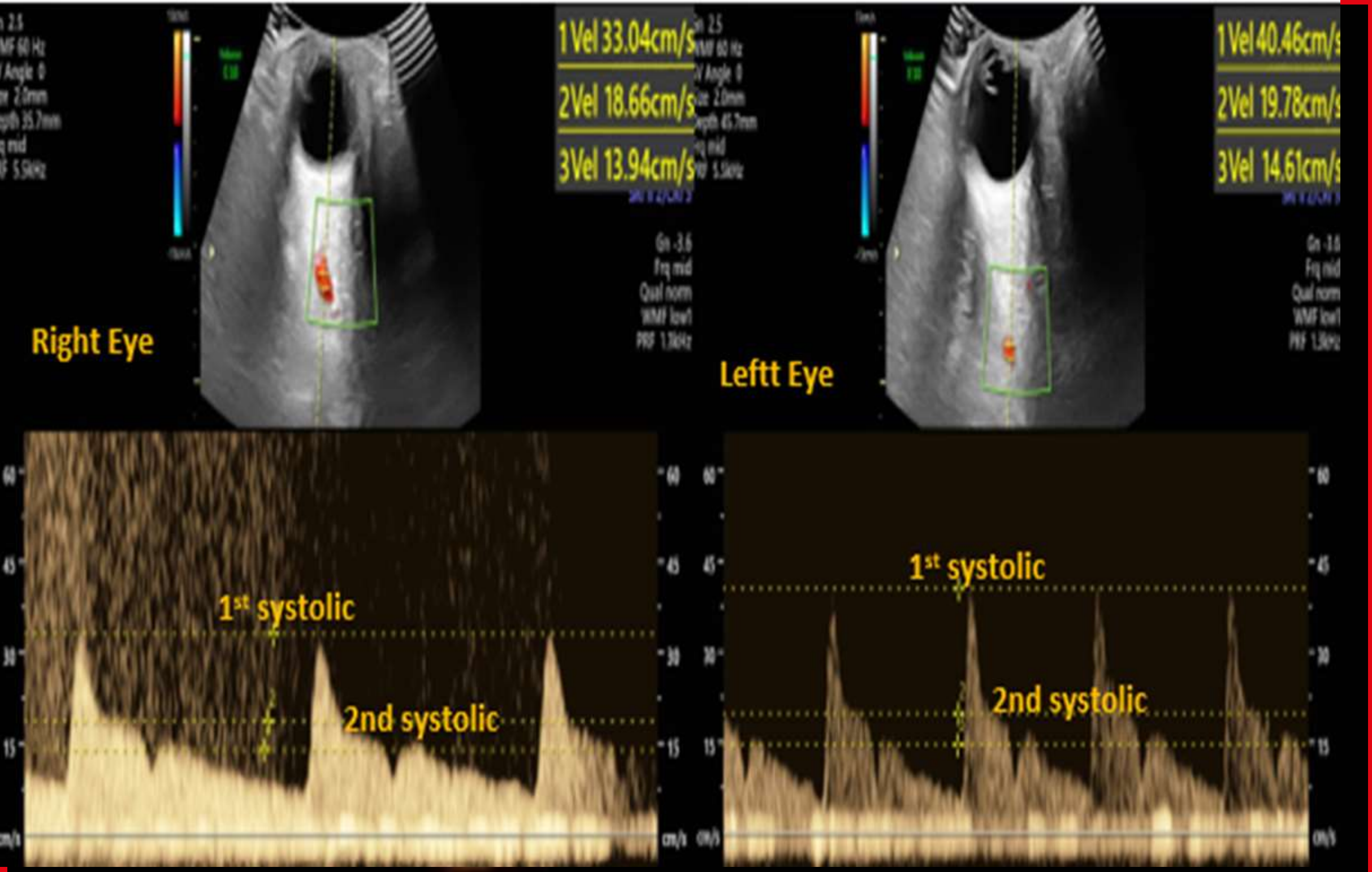


Figure 1. Maternal Ophthalmic artery Doppler Assessment

Doppler parameter	Preeclampsia (n = 26)	Normotensive (n = 204)	p value
Abnormal first peak systolic velocity (PSV1), n (%)	10 (40.0%)	24 (11.8%)	<0.001
Abnormal second peak systolic velocity (PSV2), n (%)	12 (45.0%)	28 (13.7%)	<0.001
Abnormal pulsatility index (PI), n (%)	13 (50.0%)	30 (14.7%)	<0.001
Abnormal PSV2/PSV1 ratio, n (%)	17 (66.0%)	30 (14.7%)	<0.0001

Table 1. Maternal Ophthalmic Artery Doppler Parameters According to Pregnancy Outcomes.

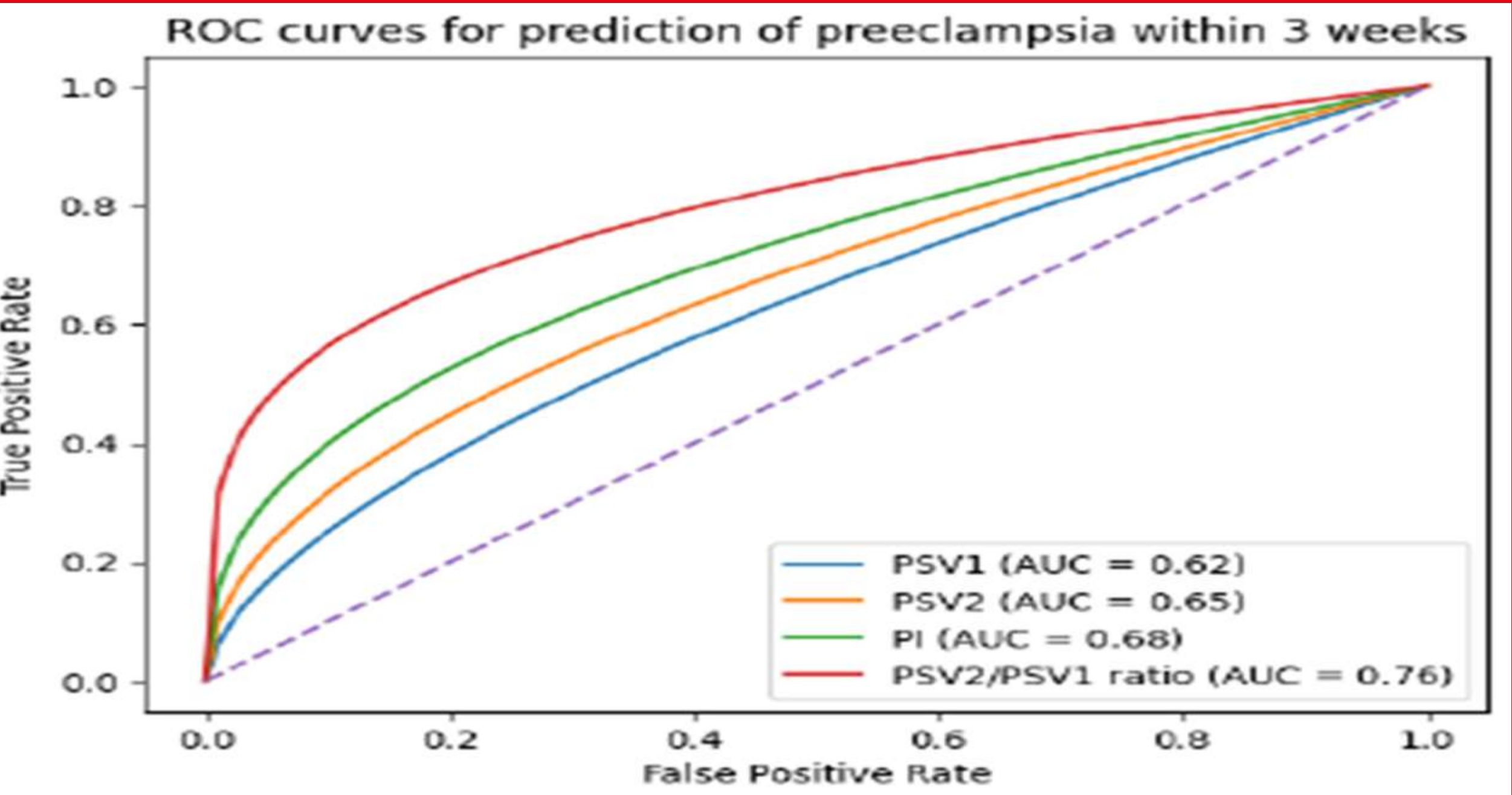


Figure 2. ROC Curve for Prediction of PE within 3 weeks.