



FIRST-TRIMESTER UTERINE ARTERY PULSATILITY INDEX AS A PREDICTOR OF ADVERSE PREGNANCY OUTCOMES IN LOW-RISK PREGNANCIES: A PROSPECTIVE STUDY

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ABSTRACT

Objective: To evaluate the role of first-trimester uterine artery pulsatility index (PI) in predicting adverse pregnancy outcomes in low-risk pregnant women. **Methods:** A prospective longitudinal study including 161 low-risk singleton pregnancies between 11–14 weeks gestation (June 2022–December 2023). Mean PI ≥ 2.35 was considered raised. Participants were followed until delivery for preeclampsia (PE), fetal growth restriction (FGR), preterm birth, stillbirth, and intrauterine death (IUD). Sensitivity, specificity, PPV and NPV were calculated. **Results:** Raised PI was observed in 12 (7.4%) women. Among them, 58% developed adverse outcomes. Sensitivity 58%, specificity 86%, PPV 25%, NPV 96%. **Conclusion:** First-trimester uterine artery PI shows high specificity and negative predictive value, supporting its role as a useful rule-out screening tool in low-risk pregnancies.

KEYWORDS : Uterine artery Doppler, Pulsatility index, Preeclampsia, Fetal growth restriction, Preterm birth, Screening

INTRODUCTION

Successful placentation requires remodeling of spiral arteries into low-resistance vessels. Inadequate trophoblastic invasion leads to high vascular resistance and is associated with preeclampsia and fetal growth restriction. Uterine artery Doppler offers a non-invasive method to assess uteroplacental circulation early in pregnancy.

specificity and high NPV in predicting adverse pregnancy outcomes. It is especially valuable in resource-limited settings as a simple, cost-effective screening tool.

CONCLUSION

First-trimester uterine artery Doppler is useful for early risk stratification in low-risk pregnancies.

MATERIALS AND METHODS

Prospective longitudinal study conducted at Bharati Vidyapeeth (Deemed to be University) Medical College, Pune, from June 2022 to December 2023. A total of 161 low-risk singleton pregnancies between 11–14 weeks were included. Women with chronic hypertension, diabetes, multiple gestation, or fetal anomalies were excluded. Mean uterine artery PI ≥ 2.35 was considered abnormal. Participants were followed until delivery.

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RESULTS

Among 161 women, 12 (7.4%) had raised PI. Sensitivity 58%, specificity 86%, PPV 25%, and NPV 96% for overall adverse outcomes.

TABLE – 1: Baseline Characteristics

Parameter	<2.35 PI	≥ 2.35 PI
Age 20–30 yrs	108	12
BMI 18–25	68	7
Primigravida	101	8

TABLE – 2: Adverse Outcomes Distribution

Outcome	Normal PI	Raised PI
Preeclampsia	4	2
FGR	5	4
Preterm Birth	10	2
Stillbirth	0	1
IUD	1	1

DISCUSSION

Raised first-trimester uterine artery PI demonstrates good