

## A Comparative Study of Intrapartum Ultrasound and Digital Vaginal Examination in the Assessment of Labour Progress

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### Abstract:

**Objective:** To evaluate the level of agreement between ultrasonography and digital vaginal examination (DVE) in determining fetal head position, to assess the correlation between these two methods in measuring cervical dilatation, and to compare their accuracy in estimating fetal head station during the first stage of labor.

**Methods:** This cross-sectional analytical study was conducted in the Department of Obstetrics and Gynecology at AIIMS Rishikesh, India, after obtaining institutional ethical approval. The study included singleton pregnancies with cephalic presentation in active labor beyond 28 weeks of gestation. Digital vaginal examinations were performed by obstetricians with postgraduate qualifications in Obstetrics and Gynecology. Blinded ultrasound assessments were carried out using a portable 2D ultrasound machine by a single obstetrician, utilizing both transabdominal and transperineal approaches.

**Results:** A total of 100 patients were included in the study. A strong positive correlation was observed between cervical dilatation measurements obtained through DVE and ultrasound ( $r = 0.786$ ,  $p < 0.001$ ). Ultrasonography demonstrated greater effectiveness in determining fetal head position, particularly in cases with intact membranes or the presence of caput succedaneum. Additionally, a significant positive correlation was found between fetal head station and the angle of progression (AoP) measured on ultrasound (Spearman's  $\rho = 0.620$ ,  $p < 0.001$ ). Moderate agreement between DVE and ultrasound was noted for assessing fetal head position (Kappa = 0.346).

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**Conclusion:** Ultrasonography demonstrates a strong correlation with digital vaginal examination for the assessment of fetal head position, cervical dilatation, and fetal head station during labor. Owing to its accuracy, reproducibility, and non-invasive nature, ultrasonography may serve as a valuable alternative to DVE, with the added advantages of reducing maternal discomfort and lowering the risk of infection.

**Keywords:**

Digital vaginal examination (DVE), ultrasound, cervical dilatation, fetal head station.