

# Correlation between cervical thickness and histological severity of cervical intraepithelial neoplasia: A transvaginal ultrasound investigation

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Cervical cancer, with estimated incidences of >0.6 million worldwide, is considered as one among the top 10 cancers. As an affordable technique, ultrasonography is commonly used in gynecologic patient management. However, detection of cervical cancer at early stage, particularly cervical intraepithelial neoplasia (CIN) is difficult to be diagnosed directly on ultrasound. In this context, here, we looked on the possible correlation between the thickness of the cervix and the grade of cervical intraepithelial neoplasia (CIN) for diagnosis purpose. We measured the cervical thickness in 120 women with abnormal cervical cancer screening tests by transvaginal ultrasound examination (TVUS) in the mid-sagittal plane. All of the women had at least one biopsy. The cervical thickness calculated in each CIN grade and the receiver operating characteristic (ROC) curves were used to determine the best cut-off value of the cervical thickness to predicted CIN2 or higher (CIN2+, including CIN2 and CIN3). The ROC curve is produced by calculating and plotting the true positive rate against the false positive rate for a single classifier at a variety of thresholds. For example, in logistic regression, the threshold would be the predicted probability of an observation belonging to the positive class. Cervical thickness increased with histological severity, with a Spearman correlation coefficient of 0.549 ( $P < 0.001$ ). The mean cervical thicknesses were 21.5 mm for cervicitis ( $n=60$ ), 22.8 mm for CIN1 ( $n=20$ ), 24.9 mm for CIN2 ( $n=20$ ), 25.6 mm for CIN3 ( $n=20$ ). The area under the ROC curve was 0.827 for the detection of CIN2+. The best cut-off value for predicting CIN2+ was 23.6 mm (sensitivity=75.0%, specificity=81.2%). Cervical thickness was statistically significantly thicker in the CIN2+ grades than in cervicitis and CIN1 grade, possibly demonstrating the potential clinical use of ultrasound examination for evaluating women with abnormal cervical screening tests. Further studies are indicated.

**Keywords:** Adenocarcinoma, Adenosquamous carcinoma, Cervical cancer