SENSITIVITY AND SPECIFICITY OF ULTRASOUND EXAMINATION BASED ON MORPHOLOGICAL ANALYSIS

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Abstract: This study evaluates the sensitivity and specificity of ultrasound examination in diagnosing uterine diseases based on morphological analysis. Uterine pathologies frequently present with nonspecific symptoms, especially in early stages, making accurate diagnosis challenging. Ultrasound is a widely used, non-invasive diagnostic method, while morphological analysis remains the gold standard. Determining the diagnostic performance of ultrasound is of significant clinical importance for improving early detection and optimizing patient management.
Keywords: uterine diseases, ultrasound, sensitivity, specificity, morphological analysis, diagnosis.

Introduction: Uterine diseases are among the most common conditions in gynecological practice and often present with nonspecific clinical symptoms, especially in early stages. This makes timely and accurate diagnosis challenging. Ultrasound examination (US) is a widely used, non-invasive, and accessible diagnostic method that allows visualization of structural changes in the uterus. However, definitive diagnosis is based on morphological (histological) analysis. Therefore, evaluating the sensitivity and specificity of ultrasound in comparison with morphological findings is of great clinical importance.
Main body: Aim: To assess the sensitivity and specificity of ultrasound examination in the diagnosis of uterine diseases based on morphological analysis.
Materials and Methods: The study included 146 women of reproductive age with suspected uterine pathology. All patients underwent transabdominal and transvaginal ultrasound examinations using high-frequency probes (5–9 MHz). The parameters assessed included endometrial thickness, echostructure, presence of focal lesions, and vascularization. Morphological verification was performed using histological examination of biopsy and surgical specimens. Diagnostic performance indicators, including sensitivity, specificity, and accuracy, were calculated. Statistical analysis was conducted using standard methods, with significance set at $p < 0.05$.

Results and Discussion: Ultrasound examination detected pathological changes in 119 (81.5%) patients. Morphological analysis confirmed pathology in 112 (76.7%) cases. The calculated diagnostic performance showed that the sensitivity of ultrasound was 91.2%, specificity was 84.6%, and overall accuracy reached 88.9%. The highest sensitivity was observed in detecting endometrial hyperplastic processes, while slightly lower specificity was noted in inflammatory conditions. These findings demonstrate that ultrasound provides reliable diagnostic information; however, in certain cases, morphological confirmation remains necessary for precise diagnosis.

Conclusion: Ultrasound examination demonstrates high sensitivity and specificity in the diagnosis of uterine diseases and serves as an effective primary diagnostic and screening tool. Nevertheless, morphological analysis remains the gold standard for definitive diagnosis. The combined use of these methods significantly improves diagnostic accuracy and optimizes patient management.

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