Title: The diagnostic performance of International Ovarian Tumor Analysis: Simple Rules for diagnosing ovarian tumors—a systematic review and meta-analysis.

Author Name: Awadia Gareeballah, Moawia Gameraddin, Sultan Abdulwadoud Alshoabi, Amirah Alsaedi, Maisa Elzaki, Walaa Alsharif, Ibrahim Mohamed Daoud, Shrooq Aldahery, Magbool Alelyani, Elrashed AbdElrahim, Fahad H Alhazmi, Zuhal Y Hamd, Raga Ahmed Abouraida, Mayeen Uddin Khandaker, Mohamed Adam.

Abstract: Introduction Adnexal masses are a common health issue in gynecology; the challenge lies in the differential diagnosis of these masses. The International Ovarian Tumor Analysis Simple Rules (IOTA-SR) offers the first scoring system to aid in diagnosis. It is based on a set of five ultrasound imaging features indicative of a malignant ovarian tumor and five features indicative of a benign tumor. This review aims to assess the diagnostic performance of IOTA-SR for classifying ovarian tumors as benign or malignant. Methods A systematic review was conducted on MEDLINE, Embase, Google Scholar, Scopus, and Web of Science. The terminologies "IOTA-SR", "adnexal, mass", and "ovarian tumors scoring" were employed. Twenty-seven research articles conducted from 2008 to 2022 were included in the meta-analysis; the publication outcome indicates that performance quality tests were extracted directly or indirectly, including true positive (TP), false positive (FP), true negative (TN), and false negative (FN). The Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2) was used to evaluate the study quality and estimate the risk of bias. After estimating the pooled effect of the sensitivity, specificity, and diagnostic odds ratio (DOR), the summary receiver operating characteristic (SROC) curve was estimated using the bivariate random effects model. Utilizing Cochran's Q statistics and Higgins's inconsistency test through the I2 index for pooled analysis, the heterogeneity of studies was quantitatively evaluated. The funnel plot and Egger's test were utilized to visually and quantitatively evaluate potential publication bias. Results Among 27 studies, including 7,841 adnexal masses, the results of this meta-analysis showed excellent diagnostic performance with a pooled sensitivity of 92% [95% confidence interval (CI), 0.89–0.94] and a pooled specificity of 92% (95% CI, 0.89–0.94). The IOTA-SR was applicable in 85.7% of adnexal masses. Conclusion The IOTA-SR is highly effective in the presurgical differentiation of malignant versus benign adnexal masses when applied by an expert ultrasonography operator.

Keyword: Adnexal Mass, Ultrasonography, International Ovarian Tumor Analysis Simple Rules, IOTA-SR, Benign Tumor, Malignant Tumor, Gynecology.

DOI: [10.3389/fonc.2024.1474930](https://doi.org/10.3389/fonc.2024.1474930)