INPLASY PROTOCOL

Corresponding author:
Hui Chen

czdyyycsk@163.com

Author Affiliation:
The First People's Hospital of Changzhou

Support: No

Review Stage at time of this submission: Formal screening of search results against eligibility criteria.

Conflicts of interest:
No.

Diagnostic performance of superb microvascular imaging for breast masses: a systematic review and meta-analysis

Fu, Z[1]; Chen, H[2]; Wang, S[3]; Zhang, J[4]; Lu, Y[5]; Mo, X[6]; Wang, C[7]; Ma, Y[8]; He, Y[9]; Jiang, J[10].

Review question / Objective: Breast cancer has been among the leading causes of cancer-associated mortality among women. The formation of new blood vessels serves an important role in the local growth, invasion and distant metastasis of breast cancer. Superb microvascular imaging (SMI) is an innovative Doppler ultrasound technique for vascular examination. To investigate the diagnostic performance of SMI in differentiating malignant from benign breast masses, we will conduct this systematic review and meta-analysis.

Condition being studied: Malignant and benign breast masses. The medical imaging technology is superb microvascular imaging.

INTRODUCTION

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METHODS

Participant or population: Women with breast masses.

Intervention: Superb microvascular imaging.

Comparator: Biopsy or surgery-proven cases.

Study designs to be included: Prospective or retrospective RCTs which evaluated diagnostic performance.

Eligibility criteria: To be considered eligible, studies have to meet the following criteria: 1. Evaluate the performance of SMI to differentiate benign from malignant breast masses; 2. Use cytology or histology as the reference standard to determine the malignancy; 3. Report the necessary data to calculate the number of true positives, false positives, true negatives and false negatives. If such data are unavailable, the corresponding author will be contacted: the study will be excluded if there is no response from contacted authors.

Information sources: Databases: PubMed, Embase, Cochrane, Web of Science.

Main outcome(s): Main outcomes will be diagnostic test performance and accuracy of superb microvascular imaging for breast masses using following statistics: diagnostic odds ratio (DOR), area under summary receiver operating characteristic (SROC) curve (AUC), and the summary estimates of the sensitivity, the specificity.

Quality assessment / Risk of bias analysis: The two investigators will independently evaluate each study by scoring seven domains of QUADAS-2 on an evaluation sheet. Any discrepancies will be resolved through discussion.

Strategy of data synthesis: 1. Study heterogeneity will be assessed using the Q and I^2 index. The $p < 0.05$ and $I^2 > 50\%$ are considered to be indicative of significant heterogeneity. If the presence of heterogeneity is demonstrated, subgroup analysis will be performed according to the common methodological and clinical features of the studies, in order to identify the possible sources of the heterogeneity. 2. Sensitivity, specificity, diagnostic odds ratio, positive and negative predictive values will be pooled. 3. The symmetrical summary receiver operating characteristic curve will be constructed to summarize the performance. 4. We will assess the possibility of publication bias by examining the asymmetry of funnel plots.

Subgroup analysis: We will conduct subgroup analyses according to the common methodological and clinical features of the studies if the presence of heterogeneity is demonstrated.

Sensibility analysis: The sensibility analysis will be conducted using Stata 16.

Language: English

Coutries involved: All the countries of studies included in the meta-analysis.

Keywords: Breast; ultrasonography; superb microvascular imaging; diagnostic performance; meta-analysis