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DIAGNOSTIC ACCURACY OF TRANSTHORACIC ECHOCARDIOGRAPHY FOR PATENT FORAMEN OVALE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives Patent foramen ovale (PFO) is a failure fusion of the primum and secundum atrial septa after birth and with a prevalence of 27% in the healthy population. It has been associated with cryptogenic stroke most common in patients younger than 55. Transesophageal echocardiography (TEE) has been considered as gold standard to diagnosis patent foramen ovale (PFO). But it is time-consuming and semi-invasive. The transthoracic echocardiography (TTE) is an optional method which is frequently used to screen this disease for it is a non-invasive and easier. But current evidence for its diagnostic accuracy for PFO is still unclear. We aimed to systematic review the diagnostic accuracy of TTE compared to TEE.

Methods Comprehensive searching in PubMed, Embase, and Cochrane library was conducted up to the end of October 2011. Two reviewers independently reviewed and extracted the data from each study. Study quality was assessed with the quality assessment for diagnostic accuracy studies (QUADAS). A random effect model was used to summary sensitivity and specificity. Summary receiver operating characteristic (SROC) curves were used to summarise overall test performance. Publication bias was assessed by Egger's test as well as the funnel plot.

Results 15 studies including 1949 subjects were included in the meta-analysis. The quality of reported studies was modest. The summary sensitivity and specificity for TTE for diagnosing PFO was 88% (95% CI 77% to 94%) and 98% (95% CI 93% to 99%), respectively. The positive likelihood ratio is 45.3 (95% CI 12 to 166) and negative likelihood ratio is 0.12 (95% CI 0.07 to 0.24). The summary diagnostic OR was 362 (95% CI 93 to 1329). Although the Egger's test and funnel plot showed a significant publication bias among studies, but pooled sensitivity and specificity only have a little change after removing the most heterogeneous study.

Conclusions The meta-analysis suggested that TTE is a test with high sensitivity and specificity for detecting PFO. It may be a useful and non-invasive modality for initial screening of significant PFO before the further investigation.