Advancing health-care access with handheld echocardiography for rheumatic heart disease

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Rheumatic fever and rheumatic heart disease continue to pose substantial challenges, particularly in low-income and middle-income countries, where they remain prevalent and disproportionately affect disadvantaged populations. The global prevalence of rheumatic heart disease is anticipated to escalate between 2020 and 2030, and specific attention has been directed towards Indigenous communities in Australia, who might be at elevated risk (possibly due to genetic predisposition and limited availability of primary and secondary prevention strategies).[1] Increased prevalence is closely associated with inadequate housing conditions, overpopulation, and disparities in accessing primary and secondary preventive antibiotics and early diagnostic measures.[2] Ongoing conflicts and displacements leading to adverse living conditions and heightened housing instability could exacerbate this situation.

Delayed diagnosis of rheumatic fever and recurrent episodes of throat infections have profound implications, contributing to the development of rheumatic heart disease. Rheumatic carditis primarily manifests as endocardial involvement, notably affecting the mitral and aortic valves, leading to valvulitis and subsequent regurgitation. Valvular regurgitation can be clinically detected as murmurs or via echocardiography. Mitral regurgitation is a common early manifestation, often accompanied by aortic regurgitation.[3] Initial valvular lesions can be asymptomatic, with no discernible alterations on cardiac auscultation (latent rheumatic heart disease). Echocardiography-detected valvular disease without clinical symptoms is termed subclinical carditis, and comprises a substantial proportion of cases.[4] Early diagnosis of subclinical carditis through echocardiography can avert severe complications through prophylactic administration of benzathine benzylpenicillin. Nonetheless, numerous countries continue to encounter challenges in ensuring widespread access to echocardiography.[5]

The economic impacts of rheumatic heart disease are substantial. A study conducted in India revealed that the expenditure associated with treating inpatients diagnosed with rheumatic heart disease was notably higher than that for other cardiovascular diseases, exceeding US$4600.[6] Implementing echocardiography screening for latent rheumatic heart disease has been proposed as a cost-saving strategy, although further economic models from diverse perspectives are warranted.

The burden of these diseases reflects underlying cardiovascular health disparities, highlighting the urgent need for innovative and accessible diagnostic solutions to facilitate early detection and diagnosis. In *The Lancet Global Health*, Rui Providência and colleagues[7] report the results of a systematic review and meta-analysis of 11 studies, providing support for the use of handheld echocardiography for the screening and diagnosis of rheumatic heart disease. These results are a pivotal contribution to the literature, suggesting that handheld echocardiography has good diagnostic accuracy when compared with standard echocardiography for the diagnosis (sensitivity 0·87 [95% CI 0·76–0·93]; specificity 0·98 [0·71–1·00]) and screening (0·79 [0·73–0·84]; specificity 0·85 [0·80–0·89]) of rheumatic heart disease, with moderate to high certainty of evidence. Thus, handheld echocardiography could help to tackle the challenges associated with this condition by providing an easy-to-use, low-cost alternative diagnostic method—particularly in high-prevalence regions where access to advanced medical equipment is limited.

Important questions that still need to be addressed include the optimal implementation and integration of handheld echocardiography into health-care systems, the necessary training and support for health workers using this method, and the long-term cost-effectiveness compared with traditional echocardiography methods. Addressing these questions is crucial for maximising the impact of handheld echocardiography in improving rheumatic heart disease diagnosis and screening, especially in resource-limited settings.

Providência and colleagues' analysis[7] included studies that involved non-experts trained in using handheld echocardiography to screen for rheumatic heart disease, which showed good diagnostic accuracy, although with slight decreases in sensitivity and specificity.

Implementing a screening approach with non-experts followed by confirmatory echocardiography could prove cost-effective in high-prevalence regions, albeit requiring substantial logistical, organisational, and governmental support. Additionally, while handheld echocardiography offers rapid assessments, ensuring consistent access to quality benzathine benzylpenicillin remains crucial for the effective management of the disease.[8]

Providência and colleagues' study[7] emphasises the importance of leveraging innovative technologies such as handheld echocardiography to improve health-care accessibility and quality, particularly in regions burdened by rheumatic heart disease. The findings support the integration of handheld echocardiography into screening and diagnostic protocols for rheumatic heart disease, offering a pragmatic solution for early diagnosis and effective management in resource-limited settings. There is a need for continued research, investment, and collaboration to realise the full potential of handheld echocardiography in advancing global cardiovascular health.

We declare no competing interests.

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