

# Working on a control program for rheumatic heart disease

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The annual grant 2012 of the Swiss Society of Cardiology enabled me to receive practical training for research application of various modalities real time three-dimensional (RT 3D) echocardiography and three-dimensional speckle tracking (at the University of Alabama, Birmingham, USA, Prof Navin Nanda).

Back in 1999, during my post-graduate training in Paediatrics at Sardar Patel Medical College, Bikaner, India, I managed a large number of children diagnosed with acute rheumatic fever (ARF). These cases were diagnosed on the basis of updated Jones criteria and then put on penicillin prophylaxis. However, many sick children aroused clinical suspicion of ARF, yet penicillin prophylaxis was precluded as they did not fulfil the updated Jones criteria. Subsequently, during my cardiology fellowship, I noticed that many patients afflicted with echocardiography confirmed rheumatic heart disease (RHD) did not have a history of ARF. Therefore, I felt clinical examination alone may not be sufficient to diagnose these cases especially during the early stages of the disease when penicillin prophylaxis might favourably alter the natural course of the disease.

I therefore conducted a school survey of apparently healthy school children of Bikaner district. Auscultation and two-dimensional transthoracic echocardiography (2D TTE) were used to diagnose RHD in a head to head comparative manner. High prevalence (54/1000) of RHD was detected by echocardiography whereas only one case out of 1059 children screened had an audible murmur suggestive of mitral regurgitation. All the children diagnosed with RHD were placed on penicillin prophylaxis and repeat echocardiography was performed after two years to validate the echocardiographic criteria for the diagnosis of RHD. It is now a well-accepted fact that the prevalence of RHD in developing countries is quite high and echocardiography is a superior screening tool for detection of RHD as compared to auscultation.

After completion of my training thanks to the SSC grant, I conducted a study at Haldiram Moolchand Cardiac Centre affiliated to Sardar Patel Medical College, Bikaner, India, using RT 3D transthoracic echocardiography (TTE) to evaluate symptomatic cases of

RHD. All the cases included in the study had classical morphological deformities of the mitral valve which were easily detected by 2D TTE. However, RT 3D TTE helped in analysing the entire echocardiographic spectrum of the morphologic changes associated with RHD in greater detail. The study highlighted that prolapse of anterior mitral leaflet (AML) which appears as reverse systolic doming of AML with or without diastolic doming is a reliable additional criterion for confirmation of an echocardiographic diagnosis of RHD. Although prolapse of AML can be detected by 2D TTE, it cannot be reliably differentiated from prolapse due to myxomatous degeneration. The en-face views of the mitral valve provided by RT 3D TTE allow us to easily differentiate between the two aetiologies by demonstrating absence of leaflet redundancy and chordal lengthening in cases of AML prolapse due to RHD. Additionally, the study highlighted the limitation of 2D TTE in detecting irregular leaflet thickening in these patients and hence may not be a suitable echocardiographic criterion for the diagnosis of RHD.

There is still a need to quantify the burden of RHD for the populations of different developing countries in a comparative manner. Currently, I am working on developing a quantitative score for measuring the population burden of RHD and this diagnostic score would potentially be based on evidence generated during diagnostic screening of the cases of RHD. I have recently become a Fellow of the ESC and a member of the ESC working group for valvular heart disease. I hope this membership shall help me to end up with a consensus for the above-mentioned diagnostic score for RHD that would greatly help in organizing a global control program for RHD.

The successful elimination of RHD from developed countries is a proof of concept that a well-organized, cost-effective program of echocardiographic screening can help prevent morbidity and mortality due to RHD in developing countries.

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