

Low agreement between cardiologists diagnosing left ventricular hypertrophy in children with End Stage Renal Disease

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Introduction

Early detection and treatment of left ventricular hypertrophy (LVH) is essential in children with end stage renal disease (ESRD) to prevent cardiac mortality. To date, LVH diagnosed by echocardiography is believed to be the most appropriate surrogate marker for cardiac disease in these children. However, in the multicentre RICH-Q project, the incidence of LVH appeared to differ considerably between centres. Therefore, we assessed the intra and inter observer reproducibility of the measurement of the diastolic inter ventricular septum (IVSd) and posterior wall (LVPWd) thickness.

Methods

Digital images of the echocardiograms of 92 children with ESRD aged 0-18 years from 4 different centres were analyzed offline by three independent observers. Kappa was calculated to assess inter observer consistency. The measurement errors are expressed as Smallest Detectable Change (SDC). To exclude within-patient variability two observers also assessed one selected image from twenty echocardiographies, representing the entire range of the patient population.

Results

Kappa between the 4 observers ranged from 0.1 - 0.4, which is considered low. The intra observer SDC ranged from 1.6- 1.7 mm and from 1.3 – 2.6 mm for IVSd and LVPWd, respectively. The inter observer SDC were 2.4 mm and 2.6 mm for IVSd and LVPWd, respectively. For selected images the intra observer SDC ranged from 1.0 - 1.3 mm and from 0.7 to 2.1 mm, the inter observer SDC were 2.1 and 2.3 mm for IVSd and LVPWd, respectively.

Conclusions

Agreement between different observers diagnosing LVH using conventional echocardiography is low. In individual children changes in diastolic wall thickness smaller than 1.6 mm cannot be distinguished from measurement error, even when measured by the same observer. This limits the use of echocardiography to detect changes in IVSd or LVPWd in children with ESRD, which may have important clinical consequences.