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Introduction: LVH in children is a marker of cardiovascular risk in both congenital and acquired diseases. However the complex relationship between heart growth and body growth in children has made indexing difficult for younger ages. Thus, a number of approaches have been suggested, mostly needing time-consuming computation of specific centiles, resulting in low applicability in clinical practice. Our purpose was to determine a simplified method to identify presence of LVH in pediatric populations.

Methods: Four hundred healthy children (N=400, 52% boys, 0-18 years) from two different European hospitals were enrolled in the study. Participants were children evaluated for innocent murmurs or chest pain who were then determined by echocardiography to have normal hearts. Exams were performed on commercially available machines and DICOM files were reviewed off line on digital review stations to obtain measurements of ventricular diameters and thickness. Left ventricular mass was calculated according to the Devereux formula.

Results: There was a strong non-linear correlation between height and LV mass. Left ventricular mass was related to height to a power of 2.16 with a correction factor of 0.09. Similar results were obtained when data were separated by gender or by age group. As compared to formula currently used in clinical practice (i.e. LVM/height2.7) in which scatter of residuals increased at lower height range, analysis of residuals for LVM/[(height2.16) +0.09] did not change with increasing height, also when dichotomizing the population by sex, suggesting an homoscedastic distribution in both genders throughout the whole height range. A partition value of 45g/m2.16 was defined as the upper limit of normality for LV mass index.

Conclusions: We have derived a simplified formula to index LV mass from a population of 400 comprising both genders and equally distributed among all pediatric age range. Our data support the possibility to have a single partition value to identify LV hypertrophy, without the time-consuming need of computing specific percentiles for height and gender. Indexation (height2.16) +0.09 with a partition value of 45g/m2.16 may be used in pediatric patients of both genders of any height, to identify LVH easily in newborns, children and adolescents.