

**Predicted upper limits for left ventricular internal diameter at end diastole in children and adolescent athletes**

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**Objectives:** The quantitative of LV cavity enlargement may be significant in the differentiation between athlete's heart and dilated cardiomyopathy.

The aim of the study was to assess the possibility of predicting cutoff values for left ventricular internal diameter at end diastole in athletic children and adolescents.

**Methods.** The study procedure was approved by regional bioethics committee. Subjects were one hundred sixty seven male athletes aged 14.8, (SD 1.6, range 12-17 years) participating in basketball, rowing and cycling and 168 healthy sedentary controls matched for age, sex and body surface area (BSA). Athletes had competed for a mean of 3.2 (SD 2.2) years with training volume 8.1(SD 2.3) hours/week. Standard two-dimensional guided M-mode and Doppler echocardiography were employed to evaluate left ventricular morphology and function. Predicted limits of LVIDd were calculated based on the mean LVIDd values +2 SD for the control subjects for every year of age.

**Results.** Compared with controls, athletes had a larger LV cavity (LVIDd) (50.16 (3.97) v 47.59 (2.89) mm), a difference of 5.4%. LVIDd exceeded predicted limits in 47.9% of athletes; there were 55.6% of cyclists and 51.6% of basketball players. LVIDd was > 54 mm in 9.6% athletes. 3.2% of athletes had an LVIDd 60 mm commensurate with a diagnosis of dilated cardiomyopathy. None of athletes had an LVIDd >60 mm. Systolic and diastolic function were within normal limits for all athletes.

Independent factors determining the value of LVIDd exceeding the predicted upper limits were older age (16–17 years old), higher body weight (OR=1.08; CI=1.03–1.13, P<0.001) and cycling sporting discipline (P<0.01).

**Conclusion.**

Almost half (47.9%) of athletes left ventricular internal diameter at end diastole exceeded the predicted limits, but minority( 3.2%) of athletes LVIDd was 60 mm. Upper normal limits of LVIDd was 60 mm. Values in excess of these should prompt further investigation to identify the underlying mechanism.

Age, body weight and cycling sporting discipline determined LVIDd exceeding the predicted upper limits.