

Supplementary Data 1

Methods

Transthoracic echocardiography was performed by an echocardiographer trained in pediatric echocardiography (EDM). A standard protocol consisting of 2-dimensional, M-mode, pulsed and continuous wave Doppler as recommended by American Society of Echocardiography (ASE) was adopted for image acquisition and cardiac measurements [1] Images were acquired and saved in DICOM format for off-line analysis. Blood samples were collected for HIV viral load and CD4 count testing. All clinical assessments were repeated at 18-month follow up.

Definitions

The echocardiographic cardiac measures were normalized to body surface area (BSA) (calculated using the Du Bois and Du Bois method) [2] and converted to z-scores using previously-published local references [3]. Echocardiographic abnormalities were broadly categorized as right and left heart abnormalities. Right heart abnormalities refer to either right ventricular (RV) dilatation (defined as a z-score $>+2$ for RV diameter end-diastole); and/or systolic dysfunction [defined as a tricuspid annular plane systolic excursion (TAPSE) z-score of < -2]; and/or pulmonary hypertension [defined as present if the tricuspid regurgitation velocity was ≥ 2.9 m/s, pulmonary arterial systolic pressure (PASP) ≥ 37 mmHg with/without additional echocardiographic variables suggestive of pulmonary hypertension (assuming right atrial pressure of 5mmHg)[4]]. Left heart abnormalities included LV dilatation (defined as a z-score $>+2$ for LV end-diastolic diameter) or hypertrophy (defined as maximal wall thickness of interventricular septum (IVS) and/or LV posterior wall (LVPW) greater than $+2$ z-scores); and/or left atrial (LA) dilatation (defined as z-score $>+2$ for LA end-systolic diameter); and/or systolic and/or diastolic dysfunction. LV systolic function was assessed using Simpson's Biplane method and an ejection fraction $\geq 55\%$ was considered normal [1]. LV diastolic

dysfunction was assessed using transmitral Doppler peak early (E) and late diastolic (A) filling velocities, E/A ratio, deceleration time and pulmonary venous flow velocities, including peak systolic (S) and diastolic (D) waves, S/D ratio and atrial reversal (Ar) velocity; paediatric reference ranges were used to define abnormality [5]. Participants were classified as having diastolic dysfunction when at least four parameters were abnormal.

Resting tachypnoea was defined as a respiratory rate $>25/\text{min}$. Stunting and wasting were defined as a z-score <-2 for height-for-age and weight-for-age respectively, using British 1990 growth references [6]. Hypoxia was defined as a resting oxygen saturation $<88\%$. Abnormal spirometry was defined as a reduced ratio of the highest forced expiratory volume in 1 second (FEV1) and forced vital capacity (FVC) (FEV1: FVC) or reduced FVC regardless of normal FEV1: FVC ratio not reversed with salbutamol [7].

Additional References

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6. Cole TJ, Freeman JV, Preece MA. British 1990 growth reference centiles for weight, height, body mass index and head circumference fitted by maximum penalized likelihood. *Stat Med* **1998**; 17:407-29
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