



# HIV-ASSOCIATED HEART DISEASE

## A management conundrum

HIV affects the heart indirectly, by causing cor pulmonale secondary to chronic lung disease, and directly, by causing HIV cardiomyopathy. Pericardial effusions are also common. All three present as a LARGE SILENT HEART, with varying degrees of haemodynamic compromise.

### Cor pulmonale

Chronic lung disease is common in HIV infected children. If the chronic lung disease is severe and/or long-standing, the chances of the child developing cor pulmonale are high.

Cor pulmonale refers to the change in structure and function of the right ventricle secondary to sustained increases in the pulmonary blood pressure.

Remember that a second common cause of cor pulmonale in children is upper airway obstruction (see [UAO guideline](#)), and this is usually CURABLE by removing the obstruction. Check ALL children with cor pulmonale for UAO

#### Signs of cor pulmonale include:

- Hepatomegaly
- Parasternal lift
- Epigastric pulsation
- Loud (palpable) P2

All these signs are difficult in children with chronic lung disease. If they are there, you must worry about cor pulmonale. If they are not there, and the child has significant chronic lung disease, you must worry that cor pulmonale might develop.

#### Investigations

CXR: chronic lung disease, and a large heart

ECG: right axis and right ventricular hypertrophy (see [ECG guideline](#))

Echo: dilated right side (MPA, RV, RA); tricuspid regurgitation

#### Management

The presence of cor pulmonale is NOT an exclusion criterion for antiretroviral therapy (ART). If ART is indicated then this should be initiated as soon as possible. If there is chronic lung disease, then the child will be at least Stage III, and therefore is eligible for ART without having to wait for a CD4 count. Don't allow further "end organ damage" to occur by prolonging the initiation of ART.

#### 1) Look after the lungs

- 1) Search for and treat pulmonary TB
- 2) Treat intercurrent bacterial ARI's aggressively
- 3) If hospitalised, allow the child to determine oxygen needs
- 4) Maintain as active a lifestyle as possible

#### 2) Optimise lung perfusion by optimising right ventricular function

- 1) Improve right ventricle myocardial contractility: DIGOXIN 0,005mg/kg/dose 12H (there is no need to use a loading regimen)
- 2) Improve right ventricular stroke volume: FUROSEMIDE 1mg/kg 12H

### HIV cardiomyopathy

HIV cardiomyopathy occurs when the left ventricle becomes myopathic as a result of end organ damage by the HIV. Contractility becomes progressively impaired leading to decreased systemic cardiac output.

#### Signs of HIV cardiomyopathy include:

A large silent heart with or without other signs of heart failure.

#### Investigations

CXR: a large heart

ECG: may be normal

Echo: dilated left side (increased end-diastolic volume) with decreased fractional shortening and ejection fraction

## Management

The presence of HIV cardiomyopathy is not necessarily an exclusion criterion for antiretroviral therapy (ART). If ART is indicated then this should be initiated as soon as possible. If there is cardiomyopathy present then the child Stage IV, and therefore is eligible for ART without having to wait for a CD4 count. Don't allow further "end organ damage" to occur by prolonging the initiation of ART.

- 1) Improve left ventricle myocardial contractility: DIGOXIN 0,005mg/kg/dose 12H (there is no need to use a loading regimen)
- 2) Improve left ventricular stroke volume: FUROSEMIDE 1mg/kg 12H
- 3) Decrease systemic afterload: CAPTOPRIL 0.05-0.1mg/kg 8H PO, increasing to a maximum of 2mg/kg 8H if necessary. In school-going children, use ENALAPRIL 0.1-0.5mg/kg 12H PO (remember to watch blood pressure closely at initiation of ACE inhibitors, usually as an inpatient)

It is often very difficult to know whether or not a child with HIV has cardiomyopathy, distinguishable from cor pulmonale, or pericardial effusion. Ideally, all children with signs of heart failure or with 'large silent hearts' should have an echocardiogram, to assess both left and right ventricular function.

## Pericardial effusion

Pericardial effusions appear to have become very common with the advent of the HIV pandemic. The possible causes are the HIV itself, TB and bacteriae. The presence of pericardial effusions seems to have an association with symptomatic HIV disease.

### Signs of pericardial effusion include:

A large silent heart with or without signs of decreased cardiac filling or output.

### Investigations

CXR: a large heart

ECG: may be normal

Echo: fluid in the pericardial space

### Management

If the effusion measures < 1cm on cardiac ultrasound, and/or there are no signs of tamponade, then management should be conservative, and TB must be actively looked for. If there is haemodynamic compromise, refer the child to a specialist service.

Pericardial effusions may be subclinical. In any child with a 'large silent heart' clinically, and/or on CXR, do an ultrasound of the heart URGENTLY looking for pericardial fluid. This can be done in most district hospitals, and all regional hospitals.

Remember: children with HIV disease may have congenital heart disease or other acquired heart disease. Do a FULL CARDIAC ASSESSMENT on all children with HIV, as you would for any other child, when indicated.