IMAGES in PAEDIATRIC CARDIOLOGY

Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

PMCID: PMC3232490

# Parasitic disease affecting the heart in childhood

H Gilles*

*Emeritus Professor of Tropical Medicine, University of Liverpool, 3 Conifers Avenue, Birkdale, Southport PR8 4SZ, Merseyside, UK*

**Contact information:** Professor Herbert Gilles, Emeritus Professor of Tropical Medicine, University of Liverpool, 3 Conifers Avenue, Birkdale, Southport PR8 4SZ, Merseyside - UK ; Email: fahy@liv.ac.uk



## Abstract

Parasitic diseases may occasionally affect the cardiovascular system, albeit rarely in childhood. In this paper, I list the main features of tropical diseases which may affect the heart.

**MeSH:** Myocarditis, Pericarditis, Myocardial Diseases, Chagas Disease, Trypanosomiasis, African, Larva Migrans, Visceral, Toxoplasmosis, Trichinella spiralis, Amebiasis, Echinococcus

Several parasitic diseases occasionally affect the heart, causing myocarditis, cardiomyopathy and pericarditis as follows:

H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

| | |
|---|---|
| **Myocarditis** | American trypanosomiasis |
| | African trypanosomiasis |
| | Visceral larva migrans |
| | Toxoplasmosis |
| | Trichinella spiralis |
| | Amoebiasis |
| | Echinococcus |
| **Cardiomyopathy** | Chagas' disease |
| | Toxoplasmosis |
| **Pericarditis** | Amoebiasis |
| | African trypanosomiasis |
| | Chagas disease' |
| | Toxoplasmosis |
| | Echinococcus |

In the majority of instances, adults are predominantly affected, cardiac pathology being uncommon in children except in Chagas' disease.

## Chagas' disease

**Distribution** South and Central America
**The parasite** Trypanosoma cruzi
**The reservoir** Humans and arborial animals
**The vector** Various species of reduviid bugs (Triatoma)
**Transmission**

1. Rubbing infected bug species onto skin
2. Blood transfusion
3. Congenital infection

**Acute stage**
Seen mainly in children:

- Reddish area at site of bite (chagoma)
- Unilateral painless orbital oedema (Romana's sign)
- High fever
- Tachycardia persisting through apyrexial periods

- Acute myocarditis with arrhythmias
- Pericarditis
- Heart failure
- Hepatosplenomegaly
- Lymphadenopathy

**Chronic stage**
Seen mainly in adult life:

- Cardiomyopathy with right bundle branch block
- Left anterior hemiblock
- Complete heart block
- Premature ventricular beats
- Atrial fibrillation
- T wave changes
- Heart failure (left and right ventricular decompensation)
- Cardiac arrest with sudden death
- Megasyndromes of the intestines

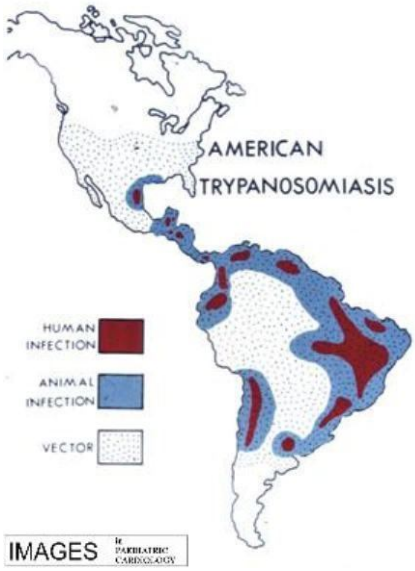
**Diagnosis**

- Trypanosomes found in blood
- Serological tests (IFAT or ELISA)
- Polymerase chain reaction

**Treatment**

- Supportive
- Benznidazole or nifurtimox
- The elimination of the disease is being achieved in several South American countries

Figure 1 Distribution of Chagas' disease



H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

Figure 2 Reduviid bug - triatoma species


Figure 3 Ideal habitat for reduviid bugs

Figure 4 Romana's sign in acute Chagas' disease

H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

Figure 5 X-ray of chest: cor pulmonale due to pulmonary hypertension

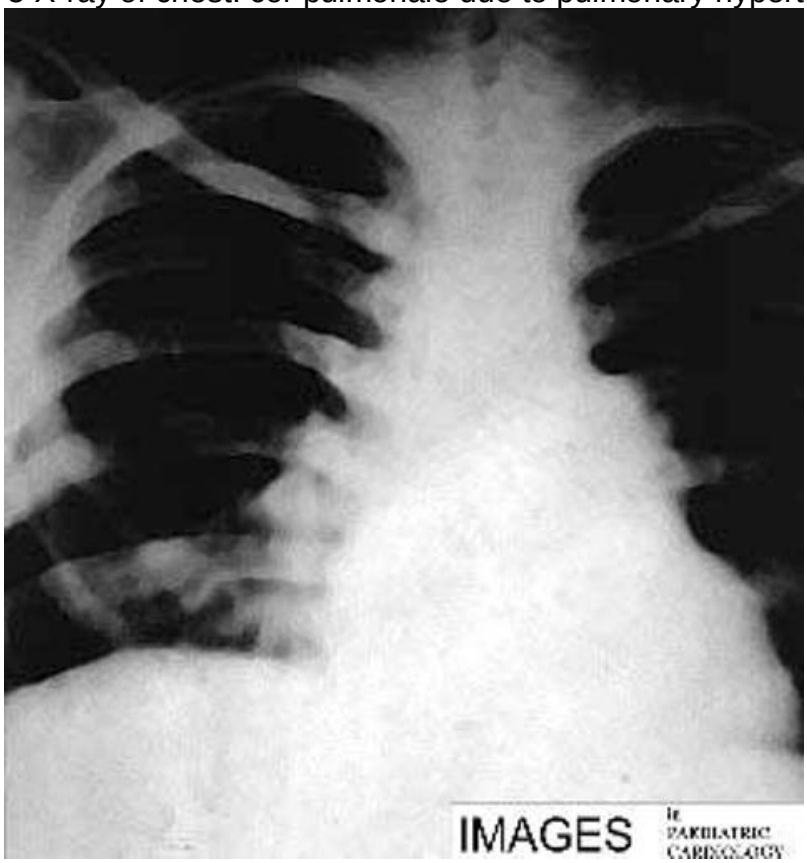
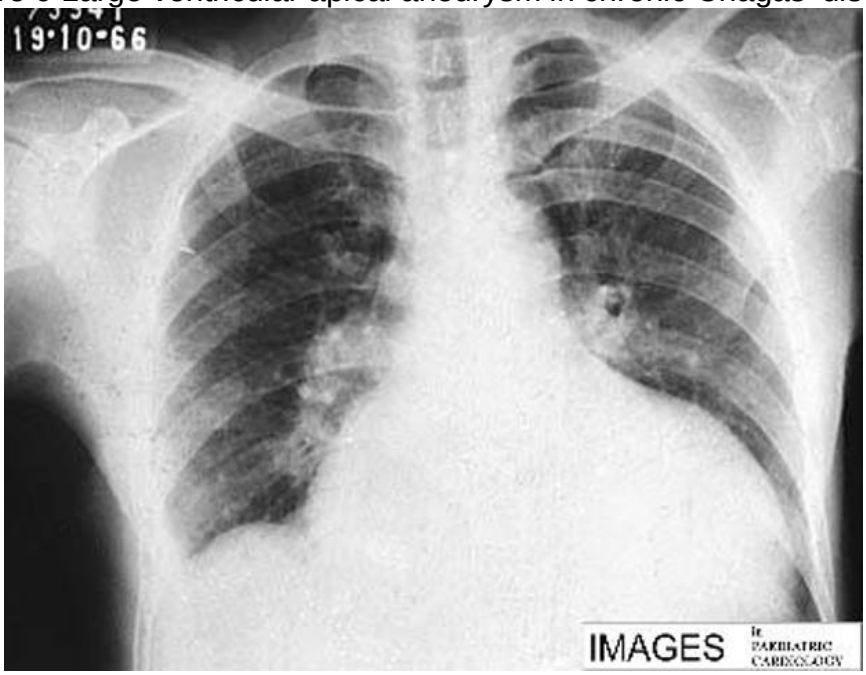



Figure 6 Large ventricular apical aneurysm in chronic Chagas' disease



H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

Figure 7 X-ray of chest showing global cardiac enlargement


Figure 8 Cardiomegaly in chronic Chagas' disease


Figure 9 Megacolon

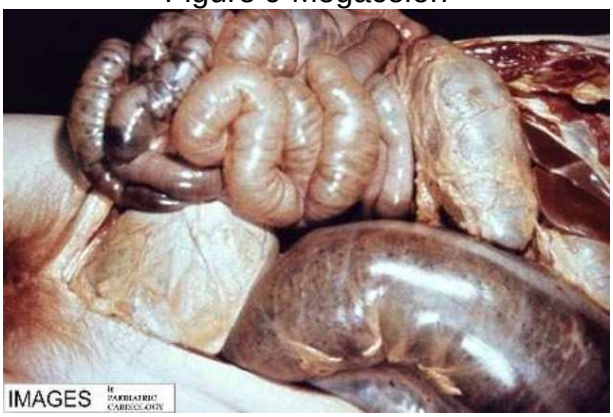
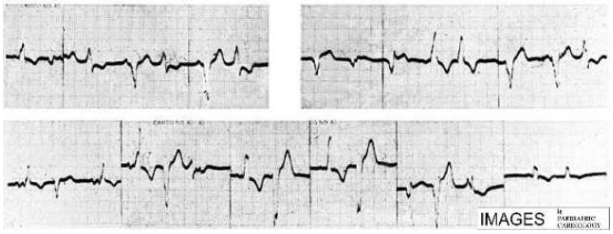


Figure 10 Complete heart block




# African trypanosomiasis

**Distribution** Africa
**The parasite** Trypanosoma brucei gambiense & rhodesiense
**The reservoir** Humans and wildlife
**The vector** Various species of Glossina (Tsetse) flies
**Transmission** Bite by fly
**Clinical features**

- Local lesion at site of bite
- Fever
- Lymphadenopathy
- Myocarditis with disproportionate tachycardia
- Tachycardia persisting through apyrexial periods
- Arrhythmias
- Heart failure
- Pericardial effusion

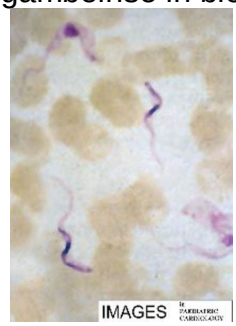
**Diagnosis**

- Trypanosomes found in blood, lymph and cerebrospinal fluid
- Serological tests (IFAT)
- Direct and indirect agglutination
- Antigen detection

**Treatment**

- Suramin
- Pentamidine (T. gambiense only)
- Melarsoprol
- Alpha-difluoromethlyornithine (DFMO)

Figure 11 T brucei gambeinse in blood film (C/O WHO)



H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

Figure 12 Tsetse fly - Glossina species


Figure 13 Trypanosomal chancre in child (C/O WHO)

H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

# Trichinosis

**Distribution** Worldwide
**The parasite** Trichinella spiralis
**The reservoir** Pigs and many wild animals
**Transmission** Ingestion of raw or undercooked animal flesh - predominantly pork or wild boar
**Clinical features**

- Fever
- Orbital oedema
- Myalgia
- Myocarditis
- Arrhythmias
- Heart failure

**Diagnosis**

- Serological tests (ELISA)
- Eosinophilia

**Treatment**

- Mebendazole
- Corticosteroids

# Visceral larva migrans

**Distribution** Worldwide
**The parasite** Toxocara canis & Toxocara catis
**The reservoir** Dogs and cats
**Transmission** Ingestion of toxocara eggs deposited on the ground in dog faeces
**Clinical features**

- Fever
- Nocturnal cough and wheezing
- Myocarditis
- Unilateral loss of vision

**Diagnosis**

- ELISA with larval stage antigens
- Eosinophilia
- Hypergammaglobulinaemia with raised IgM and IgG levels

**Treatment**

- Diethylcarbamazine
- Thiabendazole

H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

# Echinococcus

**Distribution** Africa, Middle East, Latin America
**The parasite** Echinococcus granulosus
**The reservoir** Dogs
**Transmission** Ingestion of echinococcal eggs
**Clinical features**

- Often none and found on routine X-rays or at autopsy
- Specific features relate to affected organ: liver, lung, bone and brain
- Myocarditis
- Pericarditis

**Diagnosis**

- Ultrasonography
- Radiology - crescent shadow or ‘water-lily’ effect
- Antigen detection

**Treatment**

- Surgical removal
- Albendazole or praziquantel

# Toxoplasmosis

**Distribution** Worldwide
**The parasite** Toxoplasma gondii
**The reservoir** Cats and migratory birds
**Transmission** Ingestion of oocysts and meat; congenital
**Clinical features**

- Fever
- Lymphadenopathy
- Retinochoroiditis
- Myocarditis
- Cardiac hypertrophy and dilatation
- Pericarditis

**Diagnosis**

- Biopsy and staining
- Serology e.g. dye test
- Immunohistochemistry for antigen
- Polymerase chain reaction

**Treatment**

- Sulphonamide and diaminopyrimidine

H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

# Amboebiasis

**Distribution** Worldwide but more frequent in the tropics and subtropics
**The parasite** Entamoeba histolytica & fEntamoeba dispar
**The reservoir** Humans
**Transmission** Faeco-oral route
**Clinical features**

- Diarrhoea with blood and mucus
- Extra-intestinal manifestations e.g. amoebic liver abscess
- Pericardial effusion

**Diagnosis**

- Microscopy of fresh stools
- Antibody detection
- Sigmoidoscopy

**Treatment**

- Tissue amoebicides e.g. metronidazole
- Lumen amoebicides e.g. diloxanide furoate

# Schistosomiasis

**Distribution** South America and the Caribbean, Middle East, Africa, Far East
**The parasite**

- Schistosoma haematobium (urinary schistosomiasis)
- Schistosoma mansoni (intestinal schistosomiasis)
- Schistosoma japonicum (intestinal schistosomiasis)

**The reservoir** Humans; various animals (japonicum only)
**Intermediate host** Various species of fresh water snails
**Clinical features of S. haematobium**

- Painless haematuria
- Dull ache in urethral or suprapubic areas
- Pulmonary hypertension
- Cor pulmonale

**Clinical features of intestinal schistosomiasis**

- Recurrent bloody diarrhoea
- Polyposis
- Hepatosplenic disease
- Pulmonary hypertension
- Cor pulmonale
- Spinal cord involvement
- Epilepsy with expanding intracranial mass

H Gilles. Parasitic disease affecting the heart in childhood. Images Paediatr Cardiol. 2000 Oct-Dec; 2(4): 28–39.

## Diagnosis

- Eggs in urine or faeces
- Rectal biopsy
- Renography
- Ultrasonography
- Monoclonal antibody-based dipstick assay

## Treatment

- Praziquantel