

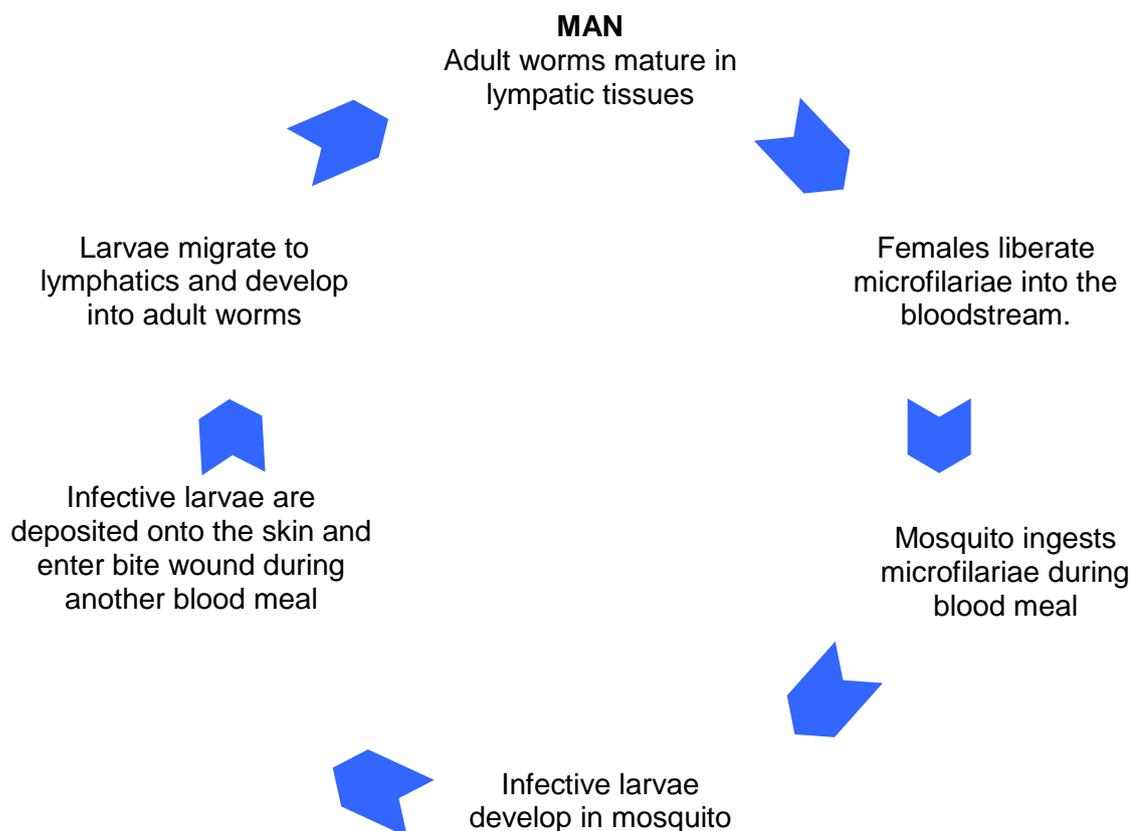
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Wuchereria bancrofti

Introduction

Wuchereria bancrofti is a nematode causing lymphatic filariasis throughout the tropics and subtropics. There are two strains of *W. bancrofti*; the nocturnal periodic strain which is widely distributed in endemic regions, the microfilariae being in their highest concentrations between the hours of 10pm and 2am, and the sub-periodic strain which is found in the Pacific region, and has a microfilaraemia all the time with the highest numbers being detected between noon and 8pm. Humans are the only known reservoir host of *W. bancrofti*.

Life cycle and morphology



The adult worm inhabits the lymphatics and the female produces sheathed microfilariae which circulate in the peripheral blood. The mosquito acquires the infection by ingestion of the microfilaria in the blood meal. The microfilariae lose their sheath on arrival in the stomach of the mosquito. The

larvae migrate to the thoracic muscles and develop into infective larvae over a period of 6 - 14 days. The larvae then migrate to the mouth parts of the mosquito and enter the skin of the definitive host through the puncture wound when a blood meal is taken.

The infective larvae enter the peripheral lymphatics where they grow to mature male and female worms. After mating, the gravid females release sheathed microfilariae which can be detected in the peripheral blood 8 - 12 months after initiation of infection.

The tail of the microfilariae of *W. bancrofti* tapers to a delicate point and exhibits no terminal nuclei and can thus be easily distinguished from the microfilariae of *Brugia malayi* and *Loa loa*, the other sheathed microfilariae of clinical importance. (See table) The sheath the microfilariae of *W. bancrofti* stains pink with Giemsa. The microfilariae are 230 - 275µm in length.

Clinical disease

Many patients are asymptomatic. Patients may present with fever. Lymphangitis and lymphadenitis develop in the lower extremities and there may also be genital and breast involvement. An inflammatory reaction occurs in the lymphatic vessels that harbour the adult worms. Oedema develops which may resolve after the first few attacks. However, in long standing disease after several episodes of lymphangitis, thickening and verrucous changes in the skin known as elephantiasis develop. Secondary bacterial and fungal infections may occur in patients with long-standing elephantiasis.

Obstruction of the genital organs may result in hydrocoele formation and scrotal lymphoedema. Obstruction of the retroperitoneal lymphatics may cause the renal lymphatics to rupture into the urinary tract producing chyluria.

Some patients with filariasis do not exhibit microfilaraemia. but develop tropical pulmonary eosinophilia which is characterised by peripheral eosinophilia, wheeze and cough. High eosinophilia, high IgE level and high anti-filarial antibody titres are features of this syndrome.

Laboratory diagnosis

When filariasis is suspected, a geographical and clinical history helps to determine the most appropriate collection time. Thick and thin blood films can be examined. However this is an insensitive method due to the low microfilaraemia, and larger volumes of blood need to be examined. The 2 methods commonly used are:

1. Polycarbonate filter technique

This technique involves a polycarbonate membrane held in a Millipore Swinnex filter holder. 10ml of blood is pushed through the membrane filter followed by 10ml of saline. The membrane is removed from the filter and examined under the microscope. A drop of formalin will slow down the actively motile microfilariae.

2. Saline/saponin method

2ml of blood is added to a centrifuge tube. 8ml of 1% saponin in saline is added. The blood is haemolysed and spun for 15 minutes at 2000 rpm and the deposit is examined for microfilariae.

In order to confirm the species, a permanent stain (refer to table) should be applied to show the presence of a sheath and the position of the nuclei in the tail.

Microfilaria may also be found in hydrocoele fluid and in urine, particularly in patients with high microfilaraemia.



Note the that the tail is free from nuclei and that the sheath is stained