

## Outbreak of Filariasis in North Bengal

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**Background:** Filariasis is major public health problem in many tropical countries as well as in state of India including west Bengal. It is considered as neglected tropical disease (NTD). In India 45 million people are estimated to be victims of this disease. The national health policy had aimed at eliminating filariasis by 2015. The deadline was extended to 2017 and now has been shifted to 2020.

In India, Filariasis is mainly caused by *Wuchereriabancrofti* (99.4%). *Brugiyamalayi* is responsible for the rest (0.6%). Filariasis is transmitted by bite of mosquito (*Culexquinquefasciatus*). Persons with filariasis have microfilaria in their blood; remain healthy but infectious whereas in chronic filariasis there is swelling of limbs, testicles due to lymphangitis, lymphadenitis and lymphoedema.

In order to interrupt transmission of filariasis, endemic area is mapped and preventive chemotherapy in form of mass drug administration is implemented.

This study was an effort to:

1. Identify microfilaria in peripheral blood smear collected from patient suffering from symptoms suggestive of filariasis.

2. Compare level of parasitemia in blood before and after giving MDA (Mass drug administration)

**Materials and Methods:** Peripheral blood samples were taken during midnight from suspected case of filariasis and were subjected to giemsa staining and microfilaria was detected by using bright field microscopy. 1012 peripheral blood samples were collected during night (10 pm-2am).

**Results:** Out of 1012 peripheral blood samples collected during night (10 pm-2am), 21 (2.07%, n=1012) patients were positive for microfilaria. They were subjected to MDA. Eventually after 3 months again peripheral blood samples were taken and found to be negative. However 3 patient's peripheral blood samples showed persistence of microfilaria but lower than previous level.

**Conclusions:** This study was an effort to detect outbreak of microfilaria in North Dinajpur district of North Bengal. 2.02% (n=1012) of population were positive for microfilaria. Proper control of *Culex* mosquito can significantly reduce this type of disease in affected area.

**Keywords:** Microfilaria, Mass Drug Administration, Peripheral blood smear

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### I. Background

Filariasis is major neglected vector borne disease in world as well as in India. This infection is also common in several areas of West Bengal district especially north bengal. About 396 million people are estimated to be living in 175 known endemic districts of which 109 million are in urban area.<sup>[1]</sup>

Lymphatic filariasis (LF) caused by *Wuchereriabancrofti* and *Brugiyamalayi* is an important public health problem in India where about a third of the global population lives at risk of this disease.<sup>[2]</sup>

The National Filaria Control Programme (NFPCP) was launched in India in 1955. The control strategy was selective chemotherapy with Diethylcarbamazine citrate (DEC) for 12 days at 6 mg/kg body wt. for parasite carriers detected from the night blood survey, and larval control of vector mosquitoes.

An effective interruption in transmission of *B. malayi* via mass drug administration (MDA) with annual single dose DEC (6 mg /kg body wt.) was demonstrated at the community level in Shertallai (now: Cherthala), Kerala for the first time during 1987-1990<sup>[3],[4]</sup>

This study was an effort to review the findings of various epidemiological studies carried out 6 months, and assess the effectiveness of control strategy and to suggest mid-course corrections.

### II. Methods

This cross sectional study was done near Islampur, Chakulia village, Uttar Dinajpur district among population who were suffering from fever, swelling of inguinal lymph node, swelling of leg and also among those who were asymptomatic. Throughout 6 months, total 1012 peripheral blood samples were collected during mid night (10 pm-2am).

The study was conducted between September 2018 to February 2019.

Following protocols were maintained during study period –

1. Collection of peripheral blood during midnight (10 pm- 2am) from suspected case as well as asymptomatic case.
2. Detection of Microfilaria in peripheral blood by Giemsa staining.
3. Mapping of endemic area and mass administration of medication among people living in those areas.

Outbreak of investigation was done by following steps:

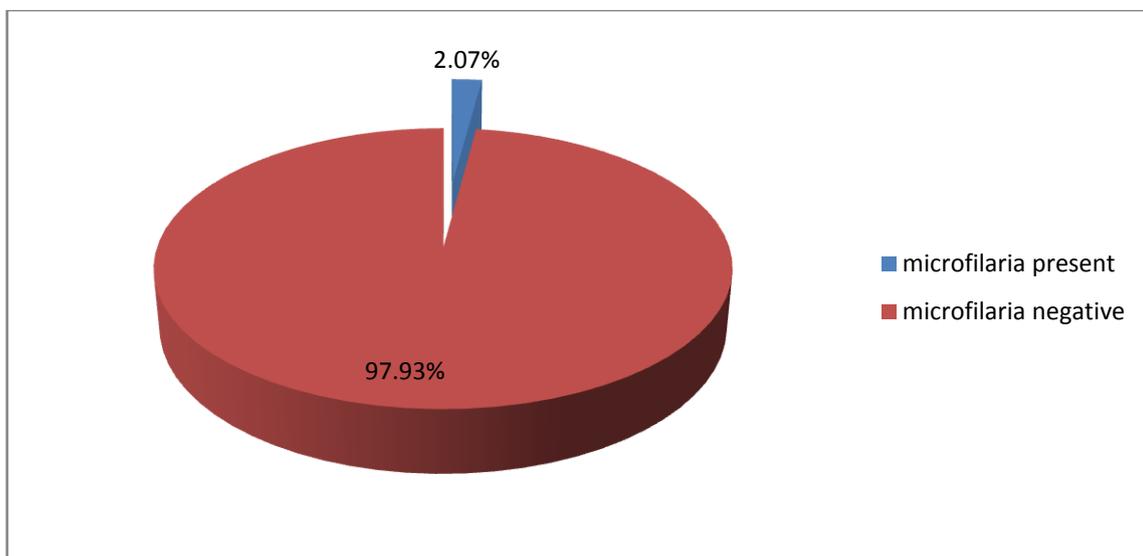
1. **Outbreak investigation team and resources:** Outbreak is the sudden occurrence of a disease in a community, which has never experienced the disease before or when cases of that disease occur in numbers greater than expected in a defined area. Outbreak was detected by sources which came from surveillance data. Report from medical practitioner, media
2. **Establish existence of an outbreak:** Outbreak was compared the current number of cases with the number of cases from comparable period during the previous years specially from surveillance records hospital records, registries, mortality statistics data from neighboring areas community survey
3. **Verify the diagnosis:** All the samples were observed for presence of microfilaria and verified.
4. **Construct case definition:** All the symptomatic (fever, swelling of lymph node, swelling of leg) and asymptomatic patients residing within Islampur, Chakulia village, Uttar Dinajpur were examined for presence of microfilaria
5. **Find cases systematically and develop line listing:** All the cases were examined systematically and examined for presences of characteristic microfilaria.
6. **Perform descriptive epidemiology/develop hypotheses:** After performing these tests following hypotheses were made-
  - a) Source of this disease was bite of Culex mosquito.
  - b) Mode of transmission: Bite of Culex mosquito
  - c) Vector of transmission: Culex mosquito
  - d) Risk factor: i) Those living in tropical and sub-tropical areas.  
ii) Travellers visiting tropical areas are at a risk.

**7. Implement control measures:**

- a) Using mosquito nets while sleeping
- b) Using mosquito repellent on naked skin
- c) Prevent mosquitoes from breeding by removing stagnant water
- d) Wearing covered clothing and avoiding open footwear (sandals, chappals)

**III. Results**

Throughout 6 months total 1012 peripheral blood samples were collected duringmid night (10 pm-2am), 21 (2.07%, n=1012) patients were positive for microfilaria.(Fig-1), (Fig-2)



**Figure 1.** Pie chart showing positivity of microfilaria among collected blood sample

All the patients, from whom blood samples were collected, were subjected to MDA. Eventually after 3 months again peripheral blood samples were taken and found to be negative. However 3 patient's peripheral blood samples showed persistence of microfilaria but lower than previous level.

#### **IV. Conclusions**

We conclude that certain individuals in the population of an endemic area develop microfilaraemia but without clinical manifestations of filariasis but some remain microfilaraemic but asymptomatic for years and sometimes even for life [5].

In the present study 97.93% of the microfilaraemic individuals were asymptomatic.

Apart for the epidemic in 1994, MF rate ranged from 0.42 to 1.55 which is quite low as compared to 10.1% reported by Prasad et al [6] from rural areas of Uttar Pradesh. Higher MF rate has been reported in other studies as well. [7, 8]

Following recommendations for prevention of similar outbreak in those areas are made as follows:

1. Annual night peripheral blood examination of all personnel and families should be carried out.
2. Proper maintenance of drainage and sewage disposal systems.
3. Monitoring of Personal protective measures.
4. Health Education.

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