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Research Note

DISSEMINATION OF FILARIA IN MAHARASHTRA AND OTHER STATES OF INDIA

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ABSTRACT

Study establishes mainly focus the spreading of filaria in Maharashtra and other states in India during year 1958 to 1995. This study indicated the possibility of predicting potential impacts on increase in density of vector and parasite by using past information and life cycle of parasite. The filarial parasite completes its life cycle in indefinite and definite host. Human being acts as definite host where it resides in the lymphatic system.

Keywords: Change in climate, Cropping pattern, Deforestation, Filaria, Irrigation

INTRODUCTION

Lichentenstein and Brug first recognized *B. malayi* as a distinct pathogen in 1927. They reported the occurrence of a species of human filariae in North Sumatra that was both physiologically and morphologically distinct from the *W. bancrofti* microfilariae commonly found in Jakarta and named the pathogen *Filaria malayi*. However, despite epidemiological studies identifying *Filaria malayi* in India, Sri Lanka, China, North Vietnam, and Malaysia in the 1930s, Lichentenstein and Brug's hypothesis was not accepted until the 1940s, when Rao and Mapel stone identified two adult worms in India.

Based on the similarities with *W. bancrofti*, Rao and Mapelstone proposed to call the parasite *Wuchereria malayi.* In 1960, however, Buckley proposed to divide the old genus *Wuchereria*, into two genera *Wuchereria* and *Brugia* andrenamed *Filaria malayi* as *Brugia malayi*. *Wuchereria* contains W. *bancrofti*, which so far has only been found to infect humans and the *Brugia* genus contains *B. malayi*, which infects humans and animals, as well as other zoonotic species.

W. bancrofti carries its life cycle in two hosts. Human beings serve as the definite host and mosquitoes as their intermediate hosts. The adult parasites reside in the lymphatics of the human host. The first-stage larvae, known as microfilariae, are present in the circulation. They migrate between the deep and the peripheral circulation. *W. bancrofti* is a periodic strain that exhibits nocturnal periodicity. During the day, they are present in the deep veins, and during the night, they migrate to the peripheral circulation. Next, the microfilariae are transferred into a vector; the most common mosquito vector species are within the genera *Culex*, *Anopheles*, *Mansonia*, and *Aedes*. Inside the mosquito vector, also known as the intermediate host, the microfilariae mature into motile larvae called juveniles. When the mosquito vector has its next blood meal, *W. bancrofti* is egested via the mosquito's proboscis into the blood stream of the new human host. The larvae move through the lymphatic system to regional lymph nodes, predominantly in the legs and genital area. The larvae develop into adult worms over the course of a year, and reach sexual maturity in the afferent lymphatic vessels. After mating, the adult female worm can produce thousands of microfilariae that migrate into the bloodstream. A mosquito vector can bite the infected human host, ingest the microfilariae, and thus repeat the life cycle of *W. bancrofti.*

The study is helpful in avoiding the circumstances for mosquito breeding and spreading the disease in future.

MATERIALS AND METHODS

The methodology involves in present paper is based upon secondary data sources. The research methodology also involved following parameters:

1) Deforestation, 2) Farm Land 3) Irrigation 4) Rice cultivation, 5) Climate 6) Rain fall 7) Temperature 8) Topography 9) Literacy.

RESULTS AND DISCUSSION

In 50's the filaria was not a major health issue in Maharashtra and India. Later on in 1958 it was observed in Maharashtra and other states of India. The first pilot project in the world for the control of LF was undertaken in Orissa from 1949-54 and in the subsequent year the National Filaria Control Programme was launched with the following objectives to: Delimit the problem; Undertake large scale control operations, and Train professionals and ancillary staff to run the programme.

Mapping of 1969 showed remarkable increase in patients of filaria. Now 17 districts of Maharashtra and 243 districts of India are endemic to filaria. The climatic condition and following factors promoted development of vectors and increase in density of parasite in this area.

1) **Deforestation:** Deforestation is one of the most potent factors at work in emerging and re-emerging infectious diseases. Through the process of clearing forests and subsequent agricultural development, deforestation alters every element of local ecosystems such as microclimate, soil, and aquatic conditions, and most significantly, the ecology of local flora and fauna, including human disease vectors. The effects of deforestation on ecosystems and human health are diverse and have taken place for many decades, though both the rate and geographic range have increased markedly over the last 50 years. Deforestation is driven by a wide variety of human activities, including agricultural development, logging, transmigration programs, road construction, mining, and hydropower development. In Maharashtra forest covering areas are Thane, Gadchiroli, Bhandara, Godia, Nandurbar, Yeotmal, Nanded (Kinwat, Mahur). Deforestation in these area forced mosquitoes to migrate in villages, towns.

2) **Farm land**: India is agriculture dominant country. India has over 210 million acres of farmland.

3) **Irrigation:** In India percentage coverage under irrigation was 31.7% in 1950-51, today more than 50%, which is responsible for formation of small water bodies and provide ground for mosquito breeding.

4) **Rice cultivation**: Rice is a staple food in many Asian countries, and over 90% of the world's rice growing area is in Asia. Unfortunately, agricultural practices involved in rice cultivation have led to the generation of a phenomenal increase in number of mosquitoes. Lowland or irrigated rice cultivation enhances population development of many mosquito species, many of which transmit human diseases. Favorable breeding habitats of pests and vector mosquitoes are inundated rice fields and other associated aquatic habitats in Riceland area. In 1950-51, 30.81 million hector areas were under rice cultivation now it has reached upto 45 million hector and the area of cultivation from 9.77 million hector to 22.50 million hectors. Now India ranks 2nd in rice production. In 1950 it was producing 20.58 million tones rice, by FY 1992, rice production had reached 111 million tons, second in the world only to China with its 182 million tons, this year (2011) the production reached to 99 million tones.

The regions cultivating this crop in India is distinguished as the western coastal strip, the eastern coastal strip, covering all the primary deltas, Assam plains and surrounding low hills, foothills and Terai region- along the Himalayas and states like West Bengal, Bihar, eastern Uttar Pradesh, eastern Madhya Pradesh, northern Andhra Pradesh and Orissa.Bhandara, Chandrapur, Gadchroli, Gondia, Sindhudurg are main rice cultivating districts of Maharashtra. It played key role in spreading of the disease in the area.

5) **Climate**: It is classified as humid subtropical, Arid, Semi arid, Tropical wet, tropical wet and dry.

a) **Humid subtropical** in Punjab, Haryana, New Delhi, Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Maharashtra, Orissa, Assam, Meghalaya, Tripura, Nagaland Manipur.

b) **Tropical wet and dry** on western coastal region (West Bengal, Orissa, Andhra Pradesh, Tamilnadu,) and Gujarat, Maharashtra, Karnataka.

c) **Arid** in most of the area of Rajasthan, Gujarat (50%).

d) **Semi arid** in Punjab, Haryana, New Delhi, Rajasthan, Madhya Pradesh, Gujarat, Maharashtra (In Marathwada), Andhra Pradesh, Karnataka Tamilnadu. 6**) Rain fall**: Average rain fall varies from 20mm (In Rajasthan) to 1000mm. On eastern coastal region of India it ranges around 200mm and between 100 to 200mm on western coastal area.

7) **Temperature:** On coastal area average temperature ranges in between 25 to 27.5°C. This is ideal for the growth of mosquitoes and is responsible for the increase in mF rate in Gujarat, Maharashtra (Thane), Kerala, Tamil nadu, Orissa, West Bengal.

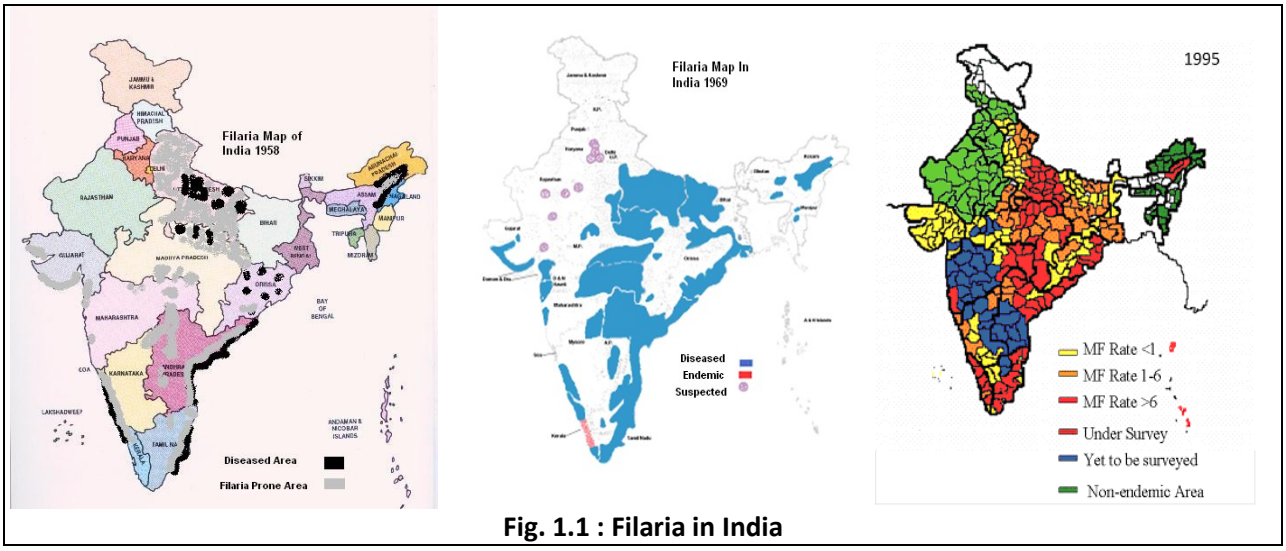

Fig. 1.1 : Filaria in India

8) **Topography:** Coastal area lies at lower altitude i.e. 300 from sea level, which is lowest. The water of river meets sea in these areas, and provides ground for mosquito breeding in Gujarat, Maharashtra (Thane), Kerala, Tamil nadu, Orissa, West Bengal.

9) **Literacy**: Here literacy is not in terms of the ability to read and write at a specified age. Here literacy means to understand the environment our health. In fig 1.1 which is very low. The literacy rate of India was 52% in 2000 and 61% in 2011.

10) **MF rate in Maharashtra and India**: Average MF rate of Maharashtra is 1.13%(2004) and 0.39%(2008) where as that of India 1.24% (2004) and 0.63% (2008). The comparative mF rate is shown in fig 1.1.

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