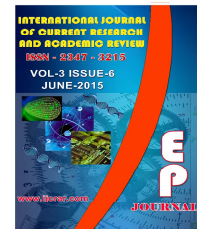




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Filaria and it's vector management practices: A case study in a filaria endemic village of Maharashtra State, India

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A B S T R A C T

Lymphatic Filariasis, caused by the transmission of *Wuchereria bancrofti* through mosquito vectors, is one the most feared diseases in this region of the Maharashtra state. The study area, Pethwadaj, is endemic for filaria since the last 73 years. The data for this study was collected through questionnaire method which was prepared as per the instructions of District Filaria Officer and Filaria Supervisor. It was recorded that the at risk population and the symptomatic villagers use different practices to manage this long term disability along with the concerned Health Department of the State government. Mass Drug Administration program was successfully implemented in this village wherein Albendazole and DEC were supplied. It was also observed that people use different practices to limit mosquito population ranging from old to modern techniques. It was strongly noted that the people residing in this village were almost unaware about the cause of this disease. So, it was recommended that there should be an ample emphasis on the public awareness in this regard so as to sensitize them.

Introduction

Lymphatic Filariasis is known to be the second leading cause of disability worldwide (WHO, 1995) is a long term disease which is caused by nematodes, *Wuchereria bancrofti*, *Brugia malayi* and *Brugia timori*. But in majority of the filarial cases reported, *Wuchereria bancrofti* is the dominant among the rest of filarial worms. It affects 120 million people in over 83 countries (WHO, 2006), out of which, around 14 million people suffer from

lymphoedema or elephantiasis of legs. This disease affects all age groups and is more frequent in the families with low socioeconomic status (Crompton *et al.*, 2003). According to the resolution passed in 1997 by the World Health Assembly Global program for Elimination of Lymphatic Filariasis was launched in year 2000 (WHA, 1997). These nematodes are sucked up by female mosquitoes to transmit it to non-infected human population at risk in the

endemic region. *Culex quinquefasciatus* is supposed to be the principle vector of this disease. It was found to be prevalent in this endemic village (Dudhmal *et al.*, 2015) but there are other mosquitoes like *Anopheles* (Audrey Lenhart *et al.*, 2007) and *Aedes* also have been reported to transmit filarial worms. Its manifestations include abnormal swellings in the legs, arms and breasts which are known as Elephantiasis while accumulation of coelomic fluid in the scrotum is known as the Hydrocoele.

The study area is Pethwadaj, a filaria endemic village since the last 73 years having a population of 7000 (2011 census). It is rural in nature and is 80 km away from Nanded city. The importance of hygiene is less understood as there were many numbers of mosquito breeding grounds (Fig. 1). There were around 700 cases of symptomatic filaria wherein about 30% were of elephantiasis and the rest were of hydrocoele type. Therefore, it was a need of the hour to throw lights on how people of this village manage filaria and its vector i.e. mosquito. The data for this study was collected through questionnaire method which was prepared as per the instructions of District Filaria Officer of Nanded district Filaria Control Unit and Filaria Supervisor of the village. Patients, their family members, neighbors were interviewed individually. Before the interviews, every subject was informed about the purpose of the study. The study was carried out for a total of 12 months from February 2014 to January 2015. It was observed that MDA program was carried out, regular Hydrocoelelectomy programs were conducted to remove the fluid surgically; fogging was done in order to destroy the mosquito breeding grounds by the health department. On the other hand, people used traditional ways of avoiding mosquitoes like smoking neem leaves, dried dung discs etc.

Materials and Methods

Study area

Before the actual study started, the study area, Pethwadaj village was selected based on its filarial endemicity for the last 73 years. The study area is rural in nature and is 80 km southeast to Nanded city. Geographical position of the Pethwadaj village is 18.781679, 77.320361 atmospheric temperature ranges from 9- 45 C in winter to summer respectively. The drainage system is open and almost surrounds the entire village Pethwadaj. Hydrophytes were observed in the accumulated sewage water (Fig. 2). The importance of hygiene and sanitation was less understood due to low literacy. As a result, numbers of mosquito breeding grounds were observed.

Data collection

Data required for this study was obtained through individual interviews with the filaria patients, family members, neighbors and villagers by questionnaire method. The questionnaire was prepared with the help of District Filaria Officer of Nanded district Filaria Control Unit and Filaria Supervisor of Pethwadaj Primary Health Centre based on their experiences to what extent the villagers answer the questions. Questions were asked to each and every house of the village

The questionnaire included questions on their name, age, marital status, basic scientific information about Filariasis, cause of the disease, possible ways to get rid of the disease, their approach to MDA etc. Initially, it was prepared in local language Marathi and then was translated into English. Before the interviews with the individuals, everyone was made aware about

the purpose of the study and its benefits to the future generations. The data was collected for a period of 12 months from February 2014 to January 2015.

Results and Discussion

After studying the data obtained through the investigation of the endemic village, following observations were noted down:

Filaria status and its management practices

- 1) 10 % of the total population of this village was observed to be affected by Filaria.
- 2) Out of which, 70 % patients were found to be affected by Hydrocoele.
- 3) 90% villagers were supplied by anti-filarial drugs like Diethyl-Carbamazine citrate (DEC) through Mass Drug Administration (MDA).
- 4) 87% of the total population of the village Pethwadaj, when interviewed was found to be unaware about the basic scientific reasons of this disease and the pathogen.
- 5) Night clinic is conducted regularly for blood sampling weekly on Monday nights from 8.00pm to 10.00pm in the Pethwadaj Primary Health Centre (PPHC).
- 6) State Health Department organizes Hydrocoelelectomy camps every year in the nearby regions for free to remove the accumulated fluid surgically.

Mosquito Vector Management Practices (MVMP)

MVMP by Health workers of the State Government

- 1) Anti-Mosquito fogging operation on the open and accumulated drainage systems.

- 2) Insect Collectors of Filaria Control Unit Nanded District collects mosquitoes from this village in order to find out if there are any parasites present in the mosquitoes.

MVMP Villagers

- 1) Villagers were found using synthetic mosquito repellents like mosquito nets, creams, ultrasonic mosquito repellents from different manufacturers.
- 2) Traditional practices like neem (*Azadirachta indica*) leaves and dried dung discs were smoked as a mosquito repellent during night.
- 3) Closing doors and windows around 6.00 pm so as to avoid the mosquito entry.
- 4) Wearing full length clothes covering the entire body.

Conditions favoring filarial endemism

It was observed that following aspects were found to be favorable for the overall filarial occurrence among the population in the village:

- 1) Accumulation of sewage as a result of open drainage system around the village to facilitate permanent development of marshy, muddy and weedy area with several hydrophytic plants flourishing in the stagnant water body favoring the growth mosquitoes.
- 2) Lack of basic scientific information among the population about the pathogen and vector of this disease and their life cycle.
- 3) Villagers do not respond to the night blood sampling for the detection of

asymptomatic filarial patients, creates problems in the early treatment of the microfilariae carriers.

- 4) Ignorance of the Health Department in conducting filaria awareness programs for the understanding of this disease among the at risk population.

Present investigation documents various practices and approaches employed by the villagers and the health workers in the context of limiting the filarial cases from an endemic village observed over a period of 12 months by the authors. Babu *et al.* (2004) along with his research team carried similar type of work in 12 villages of Orissa wherein different facts were recorded that people of the endemic area were aware of different manifestations of this long term disease but they also considered it as the problem of their community. Furthermore, they documented that many people from these villages were known about the fact that mosquitoes are the reason for elephantiasis but less were aware about the cause of hydrocoele. Through the current research, authors recorded somewhat contrast results like very few people of this endemic village are aware about this disease, about the actual cause of this disease. It was also recorded that few families employ traditional mosquito repellents. Through this study, filaria and vector management practices employed by villagers and Health department were recorded.

In a similar study of the awareness of this disease to the rural communities, Shona Wynd *et al.* (2007a) found that there is a very little knowledge about this disease to the communities living in endemic areas. Their study also revealed that there was no

awareness regarding the role of mosquitoes in transmitting the parasitic agents of Filariasis in many endemic communities. The present study also investigated the endemic population to what extent the villagers know this disease. Authors of this manuscript found similar results in concerned with the knowledge of this disease to the endemic population. It was found that people were unaware about the basic information of the vector and its pathogen of this long term disability as well.

An introduction of this disease and scientific education on appropriate hygiene, skin care techniques and simple exercise that encourage skin drainage through a nurse provided with educational materials and treatments is an effective intervention in improving the quality of life of patients with lymphoedema. According to McPherson (2003), public awareness of the patients is necessary by educating them about the scientific knowledge of this disease and also how to maintain the hygiene and skin care among the lymphoedema patients in a community of filarial endemicity; in the present investigation, similar conclusion was drawn that the people of the endemic area should be made aware about this disease through a proper channel. Slide shows, PPT presentations and video clips as well as focused group discussions will definitely do better in eradicating the long term disease.

The aim of the present study was to know the current status of the filaria and its management. This study also deals with the mosquito vector management practices employed by the villagers and also by the health workers of the State Government of Maharashtra state. Earlier in 2011, Ashton *et al.* carried out similar type of work in northern Uganda, an area showing high endemicity of *W. bancrofti*. They noted impact of MDA on the endemic population.

Fig.1 Mosquito breeding grounds in filaria endemic Pethwadaj village, Nanded (Maharashtra)



Fig.2 Hydrophytes in the accumulated sewage water from Pethwadaj village, Nanded (Maharashtra)



They also surveyed population after providing Long Lasting Insecticidal Nets. As a result, they recorded a marked reduction in *W. bancrofti* infection and infectivity in humans. Current study also deals with the data collected through individual interviews with patients, their family members, relatives and neighbors by

a questionnaire method. From the current study, it was possible to get the current status of filaria and its vector management practices used in the village both by villagers and the health authorities. So, much emphasis should be given on the public awareness programs wherein man to man and door to door information of the

disease should be provided to the people of this village as they are found unaware about this disease.

In another study by Shona Wynd *et al.* (2007b), they have suggested public understanding of the disease is more important in the context of elimination of the disease completely from the Pacific. They came to the conclusion that techniques which are valid and time efficient should be formulated to collect data providing an understanding of local health believes and practices. They reduced geographical area but surveyed more people in that area. In the present investigation, a filaria endemic village was selected and data was obtained through individual interviews. Authors came to the similar conclusion that public awareness will be more beneficial in the context of complete eradication of the disease. Through the study entitled "Lymphatic Filariasis in Khurda district of Orissa, India: An Epidemiological Study" by Babu *et al.* (2001) undertook a cross sectional survey of 12 endemic villages of Khurda district of Orissa wherein they found that the filarial cases were more in males than in females. They also found that elephantiasis was more prevalent in females than their counterparts. In current study, similar results were recorded as the elephantiasis cases are more numerous in females. Each and every affected individual was identified and asked whether they had any basic idea about this disease. About 87% people are still unaware about the primary reason of the disease. It was found that around 90% of population from these villages was supplied with anti-filarial drugs through MDA. Out of the total affected population from these villages, 30% cases are of elephantiasis and the rest were of filarial hydrocoele type. It was also noted that the hydrocoele cases are more in number comparative to elephantiasis. On the other hand, elephantiasis cases are greater in

females than in males which support the similar results by Babu *et al.* (2001).

Conclusion

Through the findings of this study, it was concluded that there should be an ample emphasis on Filaria Awareness in the village as many of the villagers are illiterate about this disease. Biology of the Parasite and its vectors should be made available to them through every possible way like pamphlets, posters, advertisement films, power point presentations etc. Importance of proper sanitation and hygiene should be taught to them. In order to control mosquitoes or to prevent mosquito bite, its breeding grounds must be destroyed.

Use of mosquito repellent creams, nets, oils must be made cheaper and accessible to the at risk population. Grampanchayat and other local governing bodies along with Non-Governmental Organizations (NGO's) should take interest in spreading person to person and door to door awareness. Hydrocoele patients should be promoted for the surgery as many of the hydrocoele patients do not bring this disability to the notice of the health workers. Night clinics should start at 10.00 pm because of the micro-filarial periodicity in the blood.

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