

Impact of MDA on Prevalence of Bancroftianfilariasis in 19 Villages of Hingnataluka of Nagpur District (Maharashtra)

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Abstract: Background: Filariasis is a serious and often underestimated public health problem. In spite of existence of the national filarial control programme since 1955, it is important to understand the change in mf rates in Indian community over time specially after initiation of MDA programme to develop effective prevention strategies. Aims and Objectives: To study the factors and circumstances related to change in mf rate in Indian community over time after initiation of MDA in 2004. Material and Methods: The study was conducted in 19 villages of Hingnataluka Nagpur, Maharashtra. A door-to-door survey was conducted in selected localities between 1st January 2011 to 30 August 2016 for detection of microfilaria in blood. Peripheral night blood surveys were conducted once in a month to detect all microfilaria carriers and to study the microfilaria prevalence. An attempt was made to cover entire population by mass blood survey. 3 rounds of monthly night surveys were conducted to cover 19 villages during 2011-16, each village was surveyed thrice during this period to monitor change in MF rate over time. Oral informed consent was taken from all patients. Mosquito surveys were carried out and vector infection rates monitored for six years (2011–2016). Mosquitoes were collected at monthly intervals in all 19 study villages. In each village, mosquitoes were collected through a mechanical aspirator from 12 fixed, spending about 15 min per household. *Culex quinquefasciatus*, were dissected in the laboratory at filarial research cum training centre Nagpur. The number of different stage filarial larvae (Mf/L1/L2/L3) present in each body part was recorded. The vector infection (% of dissected mosquitoes with Mf/L1/L2/L3) and infectivity (% of dissected mosquitoes with L3) rates were computed. Results: Out of 24030 population covered in round 1, 17033 samples were collected and examined, 115 samples were found to be MF positive, during round 2 population of 24689 was covered, 18558 samples were collected and examined, 95 samples were found positive, during round 3 population of 24872 was covered, 18635 samples were collected and examined, 62 samples were found positive. Conclusions: In the Nagpur district more than five rounds of MDA have been completed. Present survey shows an overall mf rate of 0.33 in round 3 which is less than 1, younger age group found negative for mf indicates impacts of MDA in Hingnataluka. Highest mf rate was noted in the age group of 15–39yr. Coverage of MDA has improved over last 10 years as per DMO office Nagpur, MDA clearly has a positive impact over MF rate in area. As current mf rate is below 1 and still on decreasing trend.

1. Introduction

Filariasis is a major public health problem in India, (LF) is a mosquito-borne parasitic infection that damages the lymphatic system and can cause chronic and debilitating swelling of the limbs known as lymphedema or, in its more advanced form, elephantiasis.

More than 1.2 billion people are estimated to live in areas where they are at risk for lymphatic filariasis (LF) [1], 600 million of whom reside in 250 districts in India accounting for over 40% of the global LF burden [2]. A global programme to eliminate the disease as a public health problem was launched in 2000 [3]. The programme envisages annual mass administration of a single dose of diethylcarbamazine (DEC) or ivermectin combined with albendazole (ALB) to interrupt transmission and eliminate LF by 2020.

Robust monitoring and evaluation of MDA is necessary to assess its impact and to stop MDA when the indicators of impact – Mf prevalence in the population or vector infection rate or antigenaemia (Ag) prevalence in the children born during the MDA period – fall below the threshold level. It is also necessary to monitor the post-MDA changes in LF

infection and transmission, at least for a few years, to be sure that the fall in infection is sustained. Following study is done to evaluate the impact of ongoing MDA on prevalence of filaria in rural population.

2. Method and Material

2.1 Study area

Entomological and parasitological study were conducted in 19 villages of Hingnataluka of Nagpur district under PHC Raipur with population around 67,068 [4], during 2011-16. Ongoing MDA program was initiated in these 19 villages from 2005 and still going on as per NVBDCP guideline.

2.2 Parasitological study

A door-to-door survey is conducted in the selected localities of Nagpur District to include individuals in the study. Informed consent was obtained from study individuals (parents in case of minor).

For detection of microfilaria in blood, peripheral night blood surveys were conducted once in a month between 20:00 to 23:00 hours for 5 years (2011-16) as the parasite species,

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Wuchereriabancrofti, exhibits nocturnal periodicity. To detect all microfilaria carrier and to study the microfilaria prevalence an attempt was made to cover entire population by mass blood survey. Approximately 20 cummof blood was collected by finger prick method, The blood smears were processed the next morning in the laboratory and examined for Mf (stained with JSB1 stain and examined) at RCTC Nagpur The number of microfilariae present in each positive smear was noted.

3 rounds of monthly night surveys were conducted to cover 19 villages during 2011-16, each village was surveyed thrice during this period to monitor change in MF rate over time. In some villages with large population it took 5 months to cover entire population. It took 21 months to complete round 1, 23 months for round 2, and 24 months for round 3.

2.3 Entomological Study

Mosquito surveys were carried out and vector infection rates monitored for six years (2011–2016). Mosquitoes were collected at monthly intervals in all 19 study villages. In each village, mosquitoes were collected through a mechanical aspirator from 12 fixed, spending about 15 min per household. On collection day, the mosquitoes were transported to the laboratory where they were separated according to species and sex. Specimens of the vector species, *Culexquinquefasciatus*, were dissected and others discarded. Each mosquito was cut into three parts (head, thorax and abdomen) and placed in three separate drops of normal saline. The parts were gently macerated with needles and examined under a compound microscope for the presence of filarial larvae. The number of different stage filarial larvae (Mf/L1/L2/L3) present in each body part was recorded. The vector infection (% of dissected mosquitoes with Mf/L1/L2/L3) and infectivity (% of dissected mosquitoes with L3) rates were computed

3. Results and Discussion

Out of 24030 population covered in round 1, 17033 samples were collected and examined, 115 sample were found to be MF positive, during round 2 population of 24689 was covered, 18558 samples were collected and examined, 95 samples were found positive, during round 3 population of 24872 was covered, 18635 samples were collected and examined, 62 samples were found positive.

Table 1: Parasitological survey over 6 years (2011-16)

Round	Year and month	Population covered	Sample collected	MF positive	MF rate
1	Jan 11 to Sept 12	24030	17033	115	0.67
2	Oct 12 to Aug 14	24689	18558	095	0.51
3	Sep 14 to Aug 16	24872	18635	062	0.33
	Total			272	

Table 2: Age and Sex wise distribution of MF positives

Age wise distribution	Sex wise distribution		Total
	Male	Female	
0-4	0	0	0
5-14	2	2	4
15-39	106	29	135
Above 40	85	9	94

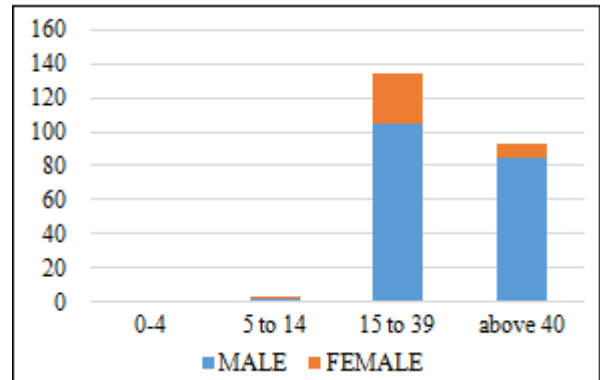


Figure 1: Age and Sex wise distribution of MF positives

3.1 Discussion

Single annual dose of MDA for elimination of LF was launched in 2000 by the WHO under an ambitious Global Programme to Eliminate Lymphatic Filariasis (GPELF) across the globe [4]. The target set for total elimination of LF is 2020. Two hundred and fifty (250) districts of India are endemic for LF and 600 million people are at risk of infection [6]. India has adopted a Government Health Policy in 2002 and set 2015 as a target to eliminate LF from its territory [5]. For all eligible endemic districts in India, administration of a single annual dose of DEC was started in 2004 which was later (from 2007 onwards) complemented with albendazole (DEC+Albendazole) as combination therapy. However, public mobilization to improve the compliance is still the main bottleneck in the success of ELF programme. The national average mf rate in 2004 was 1.2% which declined further to 0.35% in 2011. Out of 250 endemic districts of India which were under MDA in 2007, 177 districts were reported with <1% mf rate while 73 districts recorded mf rate of >1% in 2008 [7].

In maharashtra MDA started since 2005, nagpur district is under MDA since 2005 as per district malaria office Nagpur, In the nagpur district more than five rounds of MDA have been completed. Present survey shows an overall mf rate of 0.33 in round 3 which is less than 1, younger age group found negative for mf indicates impacts of mda in hingnataluka. Highest mf rate of was noted in the age group of 15–39yr. MF rate in male was quite high compared to female. Chances of higher exposure of male subjects to infective mosquito bite could be due to clothing practices where more body parts are exposed to mosquito bite compared to females. Further, in male, practice of consumption of locally made liquor is quite high compared to females and during early night hours which also coincide with biting cycle of *Cx. quinquefasciatus*, males under the influence of alcohol become least bothered to mosquito bite and hence this might have resulted into higher exposure to mosquito bite culminating into high mf rate.

Coverage of MDA have improved over last 10 years as per DMO office Nagpur , MDA clearly have a positive impact over MF rate in area As current mf rate is below 1 and still on decreasing trend .

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