

## Lymphatic filariasis in Andhra Pradesh Paper Mill Colony, Rajahmundry, India after nine rounds of MDA programme

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**Key words** Andhra Pradesh; lymphatic filariasis; MDA programme; Paper Mill colony

Lymphatic filariasis (LF) is a serious socioeconomic and public health problem due to its morbid condition, social stigma and considerable economic loss. In order to eliminate transmission and to prevent disability due to LF by the year 2015, sixteen districts of Andhra Pradesh have been under mass drug administration (MDA) programme, covering 54 million population with annual single dose of diethylcarbamazine citrate (DEC) tablets orally<sup>1</sup>. Rajahmundry town of Andhra Pradesh is one of the worst LF affected areas and is under MDA programme since 1999, covering a total nine rounds of MDA programme till 2008 (Personal communication, Department of Health, Govt. of Andhra Pradesh). Residential colonies maintained by the industries like Andhra Pradesh Paper Mill (APPM) which is situated in the heart of Rajahmundry town often remain separated from Government health facilities, specially for National Filaria and Malaria Control Programmes and managed by their own health infrastructure (Personal communication: The Chief Medical Officer, APPM). A survey was therefore initiated to note the magnitude of LF between May and July 2009 in APPM Colony situated in Rajahmundry on eastern bank of the River Godavari.

The land surface of Rajahmundry town is more or less plain with some undulations and the sub-soil water is high. The town is with open drainage and septic tank system causing mosquitogenic conditions, especially due to heavy breeding of *Culex quinquefasciatus* mosquitoes, the principal vector of LF.

Andhra Pradesh Paper Mill (APPM) is one of the major industries, situated in north-west part of Rajahmundry town. APPM has two residential colonies situated on both sides of the paper mill factory, totally protected and isolated from the main town. ‘Officers Colony’ on the right side of the factory with a population of 447 is a highly protected area, surrounded by 10 feet high wall. Officers’ quarters are well furnished, brick built three-storied buildings with 165 dwelling units. Doors and windows of all quarters (dwelling units) are fitted with mosquito-proof wire mesh. Drainage system inside the colony is of underground type. ‘Staff Colony’ on the left side of the factory is also highly protected by high wall. Quarters inside staff colony are also furnished brick built. There are 496 dwelling units with a population of 1488. Drainage system in the colony is open type without any mosquito-proof netting on doors and windows of quarters.

Night blood and disease surveys in two APPM colonies were conducted between May and July 2009, between 2030 and 2300 hrs. About 20 mm<sup>3</sup> of peripheral blood was drawn on clean glass slides, randomly from each individual by finger prick method. Slides were brought to the laboratory, numbered, dried, de-haemoglobinised, fixed and stained in Giemsa’s stain. The slides were examined under microscope for the presence of microfilaria (mf). The species of parasite was identified and number of microfilaria was counted<sup>2</sup>. The persons were also examined for lymphoedema/hydrocele cases, if any.

Table 1. Status of lymphatic filariasis in Andhra Pradesh Paper Mill Colony after nine rounds of MDA programmes

Colony/ Population	No. of persons examined	No. of disease cases (Disease rate)	MF cases (mf rate)	No. of persons received DEC from MDA in 2008	No. of persons actually consumed DEC in 2008	No. of persons using bednets	No. of persons using repellents	No. of houses checked/ No. of houses with MPS	Condition of drainage system	ADL/ Adult MHD
Officers Colony/447	217 (48.55)	7 (3.23)	0	6 (2.76)	6 (2.76)	0	140 (64.52)	95/95	Underground	6/1.5
Staff Colony/1488	321 (21.57)	21 (6.54)	2 (0.62)	98 (30.53)	69 (21.49)	6 (1.87)	150 (46.73)	135/0	Open	40/10.5
Total 1935	538 (27.80)	28 (5.20)	2 (0.37)	104 (19.33)	75 (13.94)	6 (1.12)	290 (53.90)	230/95	-	-

MPS : Mosquito prevention screen fitted on doors and windows; ADL: Average density of *Cx. quinquefasciatus* larvae/dip; MHD: Man hour density; Figures in parentheses are percentages.

Adult and larvae of culicine mosquitoes were collected from human dwellings and water-logged drains and reservoirs between 0600 and 0800 hrs following standard entomological techniques<sup>3,4</sup> to note density of adult and larvae of *Cx. quinquefasciatus*.

Detailed results on prevalence of LF in APPM Colony during May to July 2009 after nine rounds of MDA programme are shown in the Table 1. As per the data, in APPM 'Officers Colony', 217 out of 447 (48.55%) residences were screened. Disease rate was noted as seven (3.23%). Although only 2.76% residents of 'Officers Colony' actually consumed DEC tablets in MDA programme in 2008, none was found positive with mf infection in blood. Doors and windows of some houses were found with mosquito-proof netting. About 64% of population was found using mosquito repellents at night. A total of 321 out of 1488 (21.57%) persons were checked in 'Staff Colony', disease and mf rates were noted as 6.54 and 0.62% respectively. Quarters were not found to be fitted with mosquito proof netting and, 1.87 and 46.73% residents were found to use mosquito net and mosquito repellents at night respectively. Average density of *Cx. quinquefasciatus* adults and larvae in 'Officers Colony' (6 MHD and 1.5 larvae/dip) was much lower than that of Staff Colony (40 MHD and 10.5 larvae/dip).

In a study in Rajahmundry town in 2007<sup>5</sup>, mf rate was noted as 0.73%. In the present observation, mf and disease rates in staff colony in APPM were 0.62 and 6.54% respectively. None of the quarters in the colony was fitted with nets for prevention of entry of mosquitoes. Drainage system was open with breeding of *Cx. quinquefasciatus* mosquitoes. About 1.87 and 46.73% of residents were found to use mosquito nets and mosquito repellents at night respectively. DEC consumption in 2008 was 21.49%. In a recent survey in 2007<sup>6</sup>, DEC compliance and consumption rates in East Godavari district were 94.57 and 76.06% respectively which do not corroborate with our present findings. In an earlier study<sup>6</sup>, it was also noted that only 10.5% population of East Godavari district have mosquito net and 33.5% population were

using mosquito repellents at night, which roughly corroborates with our present findings.

Out of 48.55% residents of 'Officers Colony' of APPM checked, mf rate was zero. However, lymphoedema was found in seven elderly persons (disease rate 3.23%), which vary with our past findings in 2007<sup>5,7</sup>. Diseased persons only consumed DEC tablets. Man-mosquito contact in 'Officers Colony' was found to be very low (MHD of *Cx. quinquefasciatus* was only 1.5) due to the reason that doors and windows of houses were fitted with wire mesh to prevent entry of insects, underground drainage and 64.52% residents were using mosquito repellents at night. This was one of the reasons of zero mf rate in APPM 'Officers Colony'.

Therefore, apart from ongoing MDA programme, more attention is needed from health authorities to bring down man-mosquito contact by improving draining system, preferably underground drainage system with the help of Public Works Department. Motivating people towards personal protection by using bednets, repellents, etc. may give extra advantage for successful elimination of LF from India.

### Acknowledgement

The author is thankful to Special Director General, NCDC, Delhi for his constant encouragement and help. The author is also thankful to Mr P. Satya Babu,

Mr Williams Tamizharasu and Mr D. Visweswara Rao for technical help.

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*Received:* 17 September 2009      *Accepted in revised form:* 6 January 2010