OUTBREAK OF BANCROFTIAN FILARIASIS AMONG TROOPS AT AN ARMED FORCES STATION

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ABSTRACT

A large number of microfilaria (MF) positive cases were reported at a Military Hospital in 1994. The epidemiological investigations included mass night blood survey, detection of sector breeding places and entomological studies. Control measures were instituted concurrently and this included treatment of positive cases, sector control measures, personal protection and health education. The mass blood survey was continued in 1995 as well to find the outcome of control measures. A total of 215 MF positive cases were detected in 1994 with MF rate of 9.63. The only MF species identified was *Wuchereria bancrofti*. 20.3% cases were in the station for less than six months. 71.3% of MF positive cases were asymptomatic. As per state health authorities, *Culex quinquefasciatus* was the known vector for spread of the disease in the region. However, in present study, it could not be implicated as dissection of over 200 mosquitoes of this species was negative for filarial parasite. Our study stresses the importance of close monitoring of the disease by night blood surveys and effective integrated vector control measures.

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KEY WORDS: Control; Epidemiology; Filariasis.

Introduction

Filariasis is a major public health problem in many states of our country. About 396 million people are estimated to be living in 175 known endemic districts of which 109 million are in urban area [1]. Bancroftian filariasis is widely distributed and is responsible for 98 percent of filarial infection [2]. Armed Forces also consider filariasis as a major health threat and annual mass night blood surveys are carried out to detect the disease at its earliest stage. Prevalence of filariasis is related to the quality of environmental sanitation in an area. This paper describes the study of an epidemic of filaria at Kamptee Cantt in 1994 and its follow up in 1995. The epidemic came into light in early March 1994 as large number of slides of patients being examined for differential leucocyte count were found *Microfilaria* positive.

Material and Methods

The place of study was Kamptee, a small Cantt in Vidarbha region of Maharashtra. The population under study consisted of all service personnel and their families staying in the Cantt. The civilian inhabitants of the Cantt were excluded.

The study was conducted during the years 1994 and 1995. Methodology of the study was three fold viz mass night blood slide examination, study of environmental factors related to filaria and lastly study of mosquito density and attempt to implicate the known vector of the region (*Culex quinquefasciatus*) in transmission of the disease.

In March 1994 a filaria survey was carried out in the station

with the aim of covering as many people as possible who were in the station during that period. It was done by means of a night blood survey between 2030 hrs and 2330 hrs. The particulars of the cases, signs and symptoms of filariasis, if any were recorded on a predesigned proforma. Similar survey was carried out in March 1995. Data of filaria surveys conducted from 1990 to 1993 were obtained from local Station Health Organisation.

Mosquito collection, identification and dissection of *Culex quinquefasciatus* was carried out by a team of entomologists from the Directorate of Health Services Pune. The team could arrive only in May 1994 due to administrative reasons.

Results

Kamptee is a small town located in a known filarial endemic region of Vidarbha. The Cantt lies adjacent to the main town and is spread over 18 square km area. It has two urban social forestry projects one of which is in the heart of the Cantt and the other on one side. The Cantt is surrounded by a river on one side and a perennial nallah on other two sides. The main town has no drainage facilities nor a sewage disposal system. Further, there are numerous cattle sheds in the town. However, no active surveillance for filariasis was being done in Cantt General Hospital, Kamptee or in the Civil Hospital, Kamptee. There were 2850 service personnel and 1930 families with a total population under study of 4780 in 1994.

The average rainfall was 869 mm, temperature varied from 44°C to 8°C and relative humidity ranged from 56 percent to 98 percent.

Environmental studies revealed open drains most of which were blocked by brick bats, septic tanks were without lids and a number of them were overflowing. Other water collections were noted below overhead tanks.

Adult mosquito collection revealed a high density of *Culex*

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TABLE 1
Filaria morbidity at Kamptee Cantt. (1990-95)

Year	Population at risk	BSE**	ABER**	Total +ve for MF	MF rate	+ve for W. bancrofti	+ve for B. malayi
1990	4300	1429	33.23	6	0.420	6	—
1991	4650	2165	46.56	21	0.970	21	—
1992	4500	1571	34.91	9	0.573	9	—
1993	4700	1230	26.17	19	1.545	19	—
1994	4780	2230	46.72	215	9.628	215	—
1995	4800	2150	44.79	22	1.023	22	—

*BSE - Blood Slides Examined

**ABER - Annual Blood Examination Rate

quinqüefasciatus ranging from 220 to 270 per ten man hour. 200 of these mosquitoes were dissected in May 1995, but none was found positive for filarial parasite.

Epidemiological profile of filariasis in the station for the period 1990-95 is shown in Table 1. A record high of 215 cases of microfilaraemia was detected during 1994 with MF rate of 9.63%. W bancrofti has been incriminated all these years.

During 1994 and 1995, a total of 237 MF positive cases were detected and analysed critically. 49.8% of the cases were between 15-34 years of age group while only 2.9% cases were under five years. 70.5% of the cases were males. (Table 2) MF rate between males (5.1%) and females (4.5%) was found to have no statistically significant relation (P0.05)

TABLE 2
Age and sexwise distribution of cases (n-237)

Age (Yrs.)	Male		Female		Total	
	No.	%	No.	%	No.	%
0-4	2	1.2	5	7.2	7	2.9
5-14	21	12.6	7	10.0	28	11.8
15-34	80	47.9	38	54.3	118	49.8
35-49	53	31.7	15	21.4	68	28.7
50 and above	11	6.6	5	7.1	16	6.8
Total	167	70.5	70	29.5	237	100.0

71.3% of MF positive cases were asymptomatic. History of fever was present only in 14.8%, while 5.9% cases had respiratory infections. 5.5% cases had breathlessness and 3.8% had chest pain.

It is interesting to note that 47.3% of the total microfilaraemic cases detected were found to have less than 18 months of stay in the station, 20.3% had a stay of less than 6 months duration. However 41.7% of the cases had stayed over 02 years (Table 3) of

TABLE 3
Duration of stay of MF positive cases in the station (n-237)

Duration (months)	Number	Percentage	Cumulative percentage
0 - 6	48	20.3	20.3
7 - 12	41	17.3	37.6
13 - 18	23	9.7	47.3
19 - 24	26	11.0	58.3
24	99	41.7	100.0

the total 237 MF positive cases, 33.3% belonged to Uttar Pradesh, 13.9% from Maharashtra while 9.7% and 6.3% cases belong to Bihar and Kerala respectively.

Discussion

The topography, climatic and environmental factors favoured culicine breeding throughout the year. Mosquito breeding was noticed at many places in March 1994 and the mosquito density of *Culex quinquefasciatus* was very high. It is the main vector of bancroftian filariasis in India [2-4]. It preferentially breeds in dirty water collections such as drains, septic tanks and the like which were abundantly available at that time.

It is known that certain individuals in the population of an endemic area develop microfilaraemia but with no recognisable clinical manifestations of filariasis. Some remain microfilaraemic but asymptomatic for years and sometimes even for life [5]. In the present study 71.3% 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 [4] from rural areas of Uttar Pradesh. Higher MF rate has been reported in other studies as well [6-8]. Lower MF rate in females has been reported to be a random phenomenon [9] while some studies [10,11] reported it to be significantly lower. 20.3% of MF cases in the present study had a stay of less than six months in the station at the time of detection. As the known intrinsic period is about 9 months to 02 years [3] it can be hypothesized that these cases were imported. 41.3% of the cases had stayed for over 2 years at Kamptee and these cases could be clearly labelled as local.

The attempt to implicate the known vector-*Culex quinquefasciatus* as the vector in present epidemic did not succeed as 200 mosquitoes of the species dissected were found to be negative for filarial parasite.

Health education resulted in better observance of personal protective measures. Indoor insecticide sprays were done earnestly with the cooperation of the residents. All positive cases were treated with DEC. improvement in drainage system and in the disposal/septic tank systems was concurrently done by the administrative authorities. The MF rate came down from 9.63 in 1994 to 1.03 in 1995 (Table 1).

In view of the above findings, recommendations for prevention of similar outbreak in other Army Cantts are made as follows: Annual night blood examination of all personnel and families should be carried out. Better maintenance of drainage and sewage disposal systems cannot be over emphasised. Personal protective measures should be observed and monitored. Intensive health education of troops and families to improve their knowledge attitude and practice regarding filariasis is an important aspect of prevention of its transmission. Detailed epidemiological studies with better clinical, parasitological and entomological parameters are needed to delineate true nature of the problem in other stations as well. Recent trends indicate that there is no nonendemic region of filariasis in our Country.

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