A pilot study on the status of Lymphatic Filariasis in a rural community of Bihar


ABSTRACT

A pilot study of lymphatic filariasis was conducted in two contiguous villages of Patna district in Bihar situated at the side of the river Ganges, known to be endemic for lymphatic filariasis, to study present status of transmission parameters of filariasis. Of the 1872 persons examined, 8.4% were found asymptomatic but microfilaraemic. Morbidity pattern due to filarial infection showed an increase with advancement of age and significantly high in males as compared to female (p<0.001). Acute and chronic filarial disease was observed as 0.5% and 9% respectively. Microfilaria was found in 10% of acute and 11.2% of chronic filarial cases. The Mf rate was found to be 9.9% in males and 9.0% in females respectively. The parasite species was identified as W. bancrofti. The vector fauna surveyed show highest prevalence of vector species of Cx. quinquefasciatus (43%) in both domestic as well as predomestic area in the community. Other species like Cx. vishnui and Ma. uniformis were also seen. Each household and predomestic area was searched for mosquito fauna at night. The infection rate in vectors was found to be 14% and infectivity rate (L3) was 8%. The filariasis cases detected in the study were treated with 12 days course of DEC 6mg/kg body weight.

Key words: Microfilariaemia, Lymphatic filariasis, Acute/Chronic disease, Infection in vectors.

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INTRODUCTION

Lymphatic filariasis is a major public health problem and inflicts a considerable social and economic burden and long term suffering in many tropical and subtropical countries\(^1,2\). Approximately 1 billion people are at risk of lymphatic filariasis in about 100 countries. Over 120 million people are already affected and over 40 million of them are seriously affected by the disease. SEARO countries constitute half of the global burden and of this India contribute above one third\(^3\). As per recent estimates, 454 million people live in areas where 29.2 million Mf carriers and 22.5 million clinical cases are spread in 13 states of India (Andhra Pradesh, Bihar, Gujarat, Kerala, Maharashtra, Orissa, Tamil-Nadu, Uttar Pradesh & West Bengal) contributed to about 95% of total Indian burden of lymphatic filariasis\(^4\). There has been an increasing trend of lymphatic filariasis during last three decades and rural filariasis is common in India\(^5\). Govt. of India proposed revised strategy of mass-drug administration (MDA) in 13 pilot districts of the country in which Patna was not included. Till 1996, the control programme catered only 11% of urban population through filarial control units. Thus entire population residing in rural endemic areas and remaining urban areas were left unprotected\(^6\). Patna is reported to have huge number of slums, due to unplanned and rapid urbanization during the past few decades, have not only culminated in a big way in creating favorable conditions for mosquito breeding but peoples have migrated in search of work opportunities for livelihood\(^7\). Lower socio-economic status of the people mostly living in rural areas and urban slums, appalling sanitary condition has a direct bearing on the filariasis transmission\(^8,9\). A filarial survey conducted in Darbhanga and Siwan districts of Bihar had found Mf rate of 14.5% & 2.3% and disease rate 16.3% & 4.9% respectively\(^9\). On the other hand annual data of Bihar Health Department (1992-1994) shows the presence of filarial infection in most districts but unfortunately no such survey was carried out in Patna thus epidemiological data on prevalence of disease, infection, and vectors involved and its infectivity potential is lacking.

Keeping in view the above scenario, a pilot study was undertaken with a specific objective to know the present status of filarial disease viz. Mf rate, disease rate, vector infection and infectivity in defined endemic population which may be useful to health policy maker for combating/controlling the disease in the area.

MATERIAL AND METHODS

This study was conducted at Gulmahiabagh and Poonadih villages of Patna district of Bihar with de jure population of 2653. All individuals of the study area were screened for Mf and clinical sign and symptom of filariasis. Support of some local headmen and influential persons was also solicited before start of work to minimize refusal and smooth functioning. Villagers were requested to consent and for cooperation. A central place (Club house/school) was
selected for clinical and parasitological examination. The details with regard to age, sex, migration status as well as the filarial clinical profile of the person examined, were recorded in predesigned proformae. Information about mosquito breeding sites, water sources, plantation, drainage system were also recorded in proformae. Conventional finger prick technique was used to collect 20 cmm blood from each person between 8-12 PM. The blood slides thus collected were dehaemoglobinised, fixed with 2% acidalcohol and later stained with Giemsa 1: 20 dilution and examined for microfilaria in thick blood slide. Thin blood smear was also prepared and stained with leishman's stain were examined under microscope for hematological parameters.

Further to develop base line entomological data, a trained insect collector collected the adult mosquitoes between 8 PM to 12 PM using torchlight and aspirator tube. All the mosquitoes thus collected were identified and dissected to detect the developmental stage of filarial parasites. The dissections were done soon after catching and infection (L1 to L3 stage) was recorded amongst Cx. Quinquefasciatus and mansonia uniformis collected from the study area.

RESULTS

Socio-demographic Characteristics:
About 50% of study population was illiterate and majority was Hindu backward community and Hindi is the local language. About 1/4th of the households got cattle shed inside their houses and water logging was found in nearly 68% houses. About 70% of houses were kuchha (mud plastered) with main economic activity as unskilled/ agriculture labour followed by farming. The nearest Primary Health Center (PHC) from these villages was located at 4 kilometer on the main road, nearest town (Patna) at 18 kilometer to reach if better Govt. and Private Hospital facilities were to be availed.

Filariasis Situation:
Out of 1872, 970 were males and 902 females examined clinico parasitologically. It was observed that 82.1% examined population neither manifested any evidence of clinical filarial diseases nor infection (asymptomatic amicrofilaraemic) i.e. thus normal healthy people and 17.9% had definite evidence of filariasis infection in their blood. Out of which microfilaraemia was demonstrated amongst 8.4% of screened population but no clinical sign and symptoms (Asymptomatic microfilaraemic) were seen. Acute and chronic filarial disease was observed in 0.5% and 9% respectively, only 1.1% were both symptomatic and microfilaraemic. The disease in male (67%) was significantly higher (p<0.05) as compared to females (33%). History of at least one attack of filarial adenolymphagitis or adenolymphadinitis during last year was reported in 30% of acute and 65% of chronic filarial disease cases. Multiple adenolymphangitis was reported by 12% of cases with chronic disease. Out of 179 diseased, hydrocele was reported in 103 (57.5%). The manifestation of hydrocele without any history or other evidence of
The parasite species was identified as *W. bancrofti*. The vector fauna surveyed showed higher prevalence (43%) of *Cx. quinquefasciatus* in both domestic as well as periodomestic areas, beside other mosquito species like *Culex Vishnui* and *Mansonia uniformis* were also found. Out of *Cx. quinquefasciatus* dissected, 14% had filarial infection and 8.2% infective (L3). The average number of L3 per vector was found to be 5.6 (Table 2).

**DISCUSSION**

Lymphatic filariasis is one of the important public health problems in India. Though the programme for control of disease was started in 1955-1956, it met

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mf rate</td>
<td>Disease rate</td>
</tr>
<tr>
<td>0-5</td>
<td>149</td>
<td>1.3</td>
<td>0</td>
</tr>
<tr>
<td>6-10</td>
<td>211</td>
<td>6.2</td>
<td>1.0</td>
</tr>
<tr>
<td>11-15</td>
<td>131</td>
<td>7.6</td>
<td>2.3</td>
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<td>16-20</td>
<td>95</td>
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<td>21-25</td>
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<tr>
<td>31-50</td>
<td>179</td>
<td>16.7</td>
<td>35.0</td>
</tr>
<tr>
<td>&gt;51</td>
<td>81</td>
<td>12.3</td>
<td>16.0</td>
</tr>
<tr>
<td>Total</td>
<td>970</td>
<td>9.9</td>
<td>12.4</td>
</tr>
</tbody>
</table>

**Table 1. Prevalence of Mf and disease by age and sex**

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Mosq*</th>
<th>PMHD</th>
<th>Total* Dissected</th>
<th>% Infected#</th>
<th>% Infective (L3 stage)</th>
<th>Mean L3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poonadih</td>
<td>217</td>
<td>6.2</td>
<td>97</td>
<td>22.7</td>
<td>7.2</td>
<td>5.0</td>
</tr>
<tr>
<td>Gulmaih Bagh</td>
<td>874</td>
<td>8.6</td>
<td>595</td>
<td>12.6</td>
<td>8.3</td>
<td>6.0</td>
</tr>
<tr>
<td>Total</td>
<td>1091</td>
<td>8.1</td>
<td>662</td>
<td>14.0</td>
<td>8.2</td>
<td>5.6</td>
</tr>
</tbody>
</table>

*Cx. Quinquefasciatus, PMHD- Per man-hour density, # (L1 to L3)

filarisis was seen amongst 0.17%. Limb edema was observed in 31% of cases predominantly affecting lower limb. The Mf rate was (9.9%) slightly higher in males than 9% in females, it was (6%) in age group 0-15 significantly lower than (15%) in the age group of 16-50 (p<0.01) with a peak prevalence at the age group of 16-20 and the same in male and female (Table1).

The prevalence of disease was not observed in younger ages (<15 years) but then increased with age and reached the maximum at 26-30 years for both males and females and then declined at older ages (Table1).
promoting mosquitoic conditions, poor and disorganized mosquito abatement measures favor transmission of filariasis. Here again high vector densities, lower socio-economic status, etc. may be suggested to be the reasons for establishing the infection, as noted.

Under a pilot project through NAMP, health authorities of Bihar found the average endemicity of Darbhanga and Siwan as 30.8% & 7.2% respectively. As a part of this project drug distribution was to be carried out on National Filarial Day. The NAMP was to provide the drugs and money for IEC component. But at the state level, under control activity only DDT spraying and drug distribution has been carried out in Malaria/Kala-Azar programme. Irregular DDT spraying was documented by earlier conducted studies on Kala-azar—one of the major public health problem of Bihar. The State health department observed filsariasis week under FCP in which blood was collected for Mf and drug (DEC) was distributed if found ill. A study on lymphatic filariasis was conducted in the same area shows the poor level of KAP towards filariasis. 80% people do not take it as a serious disease and not bothered about this disease, only 19% accepted DDT as a control measure. If this situation is allowed to be continued without appropriate intervention the morbidity may increase further.

However, recent growing support for mass chemotherapy programme provides hope that the burden of lymphatic filariasis can be reduced, if not eliminated, as happened at Tahiti and
Fiji. Further health authorities should strictly exercise powers on all developmental projects to act in such a way that does not create mosquitogenic conditions. This may improve the chance of success and in addition act to reduce mosquitoes breeding sites, improve housing and sanitation facilities and stimulate economic development if given sufficient priority.

REFERENCES


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