Independent Assessment of Mass Drug Administration in filariasis affected Surat city

KG Vaishnav* and IC Patel*

ABSTRACT

The Mass Drug Administration (MDA) done in Surat city (Gujarat) during 2005, revealed good impact on infection and infectivity in mosquitoes and also on microfilaria rate & mean infection density. The overall impact seen was 23% on mf rate, 28% on mean mf density, 65% on infection rate and 50% on infectivity rate in vectors. Indigenous population contribution to microfilaria cases was 9.7% whereas migratory population contributed 72.2%; predominant 51.9% from Orissa and 20.3% from U.P.

Of the total 3640 persons interviewed for MDA compliance in seven zones of the Surat city revealed that actual drug consumption was 76.7%(2792/3640). Another 11.9% although took the drug but did not consume and 11.4% refused. Important reasons for consuming was fear to get the disease (40.7%) and for not consuming; 'will consume after meal' (6.9%), too many tablets (1.7%), seek consent from doctor (1.5%), lack of awareness (1.4%) etc. Refusal was mainly due to the reason as respondents felt apparently healthy. Assessment of IEC activities suggested that main awareness was created by media (local or national TV, banners or handbills, local news papers or mike announcement) alongwith some impact made through NGO's. These observations clearly indicated the utility of effective health education for optimum community participation and shown that it was crucial for successful community based elimination campaign. However some gray areas also suggest the scope for further improvements.

Key words: MDA, Lymphatic filariasis

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INTRODUCTION

Lymphatic filariasis (LF) or elephantiasis is one of the most debilitating and disfiguring disease. It is estimated that there are about 600 million people living in the endemic areas in South-East Asia region constituting about 60% of the global burden. The global elimination of LF has been targeted by the year 2020 and India wishes to achieve this by 2015. Anti-parasitic measures through mass drug administration (MDA) play a major role in the elimination of LF. Annual single dose of DEC for 5-6 years is aimed to reduce the infection load in the community to such a low level at which vector would not be able to transmit the infection. It has been observed in the past during field visit that the actual drug consumption was lower than the coverage by paramedical health workers/volunteers. Although IEC is the main pillar of the success of elimination campaign but the community response was poor in many endemic areas due to lack of awareness and negligence. As per the norm, the drug is to be consumed in the presence of drug distributors, but at many occasions the drug was to be handed over to the family members for consumption. It was observed that a substantial proportion of community members do not consume the drug. Therefore, an independent assessment of MDA was carried out in Surat city during November 2005. The assessment was undertaken within one week of drug distribution so that the community members should be able to recall the events.

MATERIAL AND METHODS

Study design: The urban area of Surat City is 112.28 sq. km with a population of about 2.4 million (2001 census). The city has been divided into seven zones, viz., Central, West, South, South-East, South-West, North and East. In each municipal zone, three areas were selected for routine sentinel sites and continue for 5 years. In addition; three random sentinel sites were also selected for night blood survey to measure the impact on microfilaria carriers and lymphoedema cases and these were changed every year. The study areas were selected on the basis of predominance of microfilaria carriers and lymphoedema cases. Thus 21 such units were selected from the city. The night survey to collect blood smear at 9.00 P.M onwards were carried out post MDA as done before (baseline in 2004). These slides were checked for microfilaria using standard procedures. Any one found with 1 or more filarial parasites was classified as 'carrier' and parasites counts recorded.

In addition, the objective of this study was also to determine factors of the refusal and acceptance of DEC administration as this can help to develop a suitable strategy to maximize the community participation in LF elimination programme. A questionnaire was used to collect information on drug compliance. The drug distributor’s household register were collected from urban health centre (UHC) and carried to the areas for cross-checking the entries. Names of the family members and their recorded age served as the basis for
physical verification of tablets, defaulters, side effects, IEC, diseases cases and information on MDA acceptance and non acceptance recorded. In seven city zones, a total of 3640 persons were interviewed during the period of 13-19th November' 2005 and information collected.

RESULTS

Impact on MF rate

The Surat city has a large industrial base particularly it attracts persons from several other states beside from other parts of Gujarat. It therefore attracts persons and so the infection with them to this geography. The persons evaluated for microfilaria carrier were largely (51.9%) from Orissa followed by 20.3% from U.P, 6.3% from Bihar, 5.7% from within Gujarat (Surat city excluded) and 3.1% from other places and 9.7% only from the city alone (Fig.1).

The impact on Mf rate during the period of 2004-05 is presented in Table 1. The date suggest that Mf rate in the Surat city declined by 23% from 1.17% in 2004 to 0.90% in 2005. The zone-wise data suggested that Mf rate has declined in all but South-west and East zones recorded increase in Mf rate. The cause of this increase in 2 zones is being investigated.

![Figure 1. Percent Contribution of Micro Filaria Carriers by states](image)

Table 1. Comparative Microfilaria rate in 2004 (pre-MDA) and 2005 (Post-MDA)

<table>
<thead>
<tr>
<th>Name of Zone</th>
<th>Year - 2004 No. of Persons Examined</th>
<th>Year - 2005 No. of Persons Examined</th>
<th>Mf Rate in 2004 (mf+ve)</th>
<th>Mf Rate in 2005 (mf+ve)</th>
<th>% Change in 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>2190</td>
<td>2089</td>
<td>0.5 (11)</td>
<td>0</td>
<td>-100</td>
</tr>
<tr>
<td>West</td>
<td>1696</td>
<td>1801</td>
<td>1.77 (30)</td>
<td>0.05 (10)</td>
<td>-68</td>
</tr>
<tr>
<td>South</td>
<td>2119</td>
<td>4040</td>
<td>1.93 (41)</td>
<td>1.04 (42)</td>
<td>-46</td>
</tr>
<tr>
<td>S-East</td>
<td>2817</td>
<td>3450</td>
<td>0.5 (14)</td>
<td>0.23 (08)</td>
<td>-54</td>
</tr>
<tr>
<td>S-West</td>
<td>1670</td>
<td>1506</td>
<td>0.42 (07)</td>
<td>0.8 (12)</td>
<td>+90</td>
</tr>
<tr>
<td>North</td>
<td>2202</td>
<td>2658</td>
<td>2.0 (44)</td>
<td>1.92 (51)</td>
<td>-4</td>
</tr>
<tr>
<td>East</td>
<td>2878</td>
<td>3088</td>
<td>1.22 (35)</td>
<td>1.49 (46)</td>
<td>+22</td>
</tr>
<tr>
<td>Total</td>
<td>15572</td>
<td>18632</td>
<td>1.17 (182)</td>
<td>0.9 (169)</td>
<td>-23</td>
</tr>
</tbody>
</table>
The entomological parameters have also shown decline during this period; the infection rate declined by 65.3% (0.26% to 0.09%) and infectivity rate by 50% (0.06% to 0.03%), inspite of increase recorded in ten man-hour density (TMHD) from 34.1 to 64.8 (Table 2). TMHD can vary due to seasonal and local parameters without significantly influencing infection and infectivity in vector i.e. *Culex quinquefasciatus*. The mean parasite density in human hosts had also declined by 27.7% (5.71 to 4.13).

These observations indicate that one year MDA programme shows 23% reduction in mf rate and 28% in mean mf density.

**Coverage Assessment**

The micro plan for mass drug administration in Surat city was prepared for 11th November 2005- National Filaria Day. The drug (DEC) was distributed through a team of drug distributors (DD) and the same was recorded in their register. The coverage assessment was carried out during 13-19th November 2005. The household register of DD’s recorded 88.6% coverage under MDA but the assessment team found out that the actual drug consumption achieved was 76.7% who swallowed DEC tablets in presence of drug distributor, 11.9% persons taken DEC but did not swallow in presence of DD or even later on and 11.4% persons refused giving various clues. The MDA compliance in seven zones of the Surat city was 79% in Central zone, 76% in West, 74% in South, 83% in South-East, 71% in South-West, 73% in North and 85% in East zone respectively. Data shows that in East zone highest 84.6% consumed the drug in presence of worker and lowest observed in South-West 71.3% respectively.

The main factors responsible to accept and consumed were as follows; effective to prevent filariasis (7.1%), free supply (8.2%), Fear to get the filariasis (40.7%), persuasion by drug distributor (17.1%) and others (6.6%). The main reasons for not consuming were empty stomach (6.9%), too many tablets (1.7%), to take consent of the doctor (1.5%), and lack of awareness (1.4%). Among those who refused, major share (7.6%) belonged to those who felt no need to take it since they do not have any disease followed by lack of faith in workers (1.8%), Reaction/side effects (0.8%) and rest (1.2%) as others (Table 3).

The assessment of IEC activity suggest that 67.4% learnt about MDA campaign from local vedio channel on TV or national programme followed by 12.5% from local publicity using banners/handbills/posters, 8.4% from local newspapers, 3.9% learnt from mike

<table>
<thead>
<tr>
<th>Period</th>
<th>Total Cx. Quinquefasciatus Dissected</th>
<th>Time spent (hours)</th>
<th>10 Man - Hour Density (TMHD)</th>
<th>Infection Rate</th>
<th>Infectivity Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun’ 2004</td>
<td>3125</td>
<td>915</td>
<td>34.1</td>
<td>0.26</td>
<td>0.06</td>
</tr>
<tr>
<td>Dec’ 2005</td>
<td>3192</td>
<td>492</td>
<td>64.8</td>
<td>0.09</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Table 2. Ten-man hour density, infection and infectivity rate of *Cx. quinquefasciatus*
DISCUSSION
Since 'one round of MDA' brought reduction in infection rate by 65% and 50% in infectivity rate alongwith 23% decline in mf rate and 28% in mean density, it is believed that faster reduction in the reservoir of infection and thus the transmission potential in urban areas is possible provided the control efforts are sustained for 5 years and coverage improves. The main reason for filariasis is due to immigrants labourers from filaria endemic areas of Ganjam District of Orrisa to South-West areas of Surat City²³.

Mass chemotherapy is an effective control method to eliminate LF⁵, Countries like China, Japan, Korea, Thailand and the Solomon Islands using different MDA strategies have demonstrated that transmission could be stopped permanently⁶. The study indicate also some gray areas- if efforts made to improve, the coverage and compliance, the decline can be achieved faster than recorded.

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