Estimation of different degrees of provocation by DEC (diethyl carba mazine citrate) medication in bancroftian filariasis in Vellore, Tamilnadu

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DEC in general has the power to bring out the filarial worms into the peripheral blood when administered. The provocative effect was observed in 86.8% of the mf positive cases. Optimum provocative effect was noticed in the age group above 12 years and there was no influence on sex. The maximum effect of provocation was seen at 60 min after the administration 2mg/kg body weight DEC. The mf rate was high in the blood collected after the administration of DEC during day time, than that during night.

Filaria is one of the major health problem in India. It is a chronic disease and has got social, economic and physical hazards. It is one of the major causes of morbidity in 120 million individuals, spreaded over 73 countries all over the world. India is one of the most affected country where, about 45 million people are estimated to be victims of the disease and about one third of the Indian population is exposed to the risk of bancroftian filariasis.

The common house mosquito Culex quinquefasciatus is the vector of human filariasis caused by Wuchereria bancrofti in India. In urban environment due to various factors mosquito menace has increased extensively.

All the subjects living in an endemic region are more or less equally exposed to the infective bites of the vector and available methods are sufficiently sensitive for diagnosis. It has been repeatedly emphasized that surveillance for any disease is a pre-requisite to provide timely warning of public health disasters to enable authorities to mobilize intervention. Any change of distribution of a infection can be detected through surveillance so that health authorities are able to initiate suitable measures for control. The present investigation is significant in this context.

The microfilaraemia control and surveillance with DEC (diethyl carba mazine citrate) is safe and effective for human lymphatic filariasis. Result are usually apparent with in a relatively short period, unfortunately when given in standard doses DEC quite often produces side reactions especially in brugian filariasis which are frequently unacceptable by the affected communities. DEC mobilizes the nocturnal periodic microfilaria (mf) into the circulating blood after oral administration of a small dose during day time. The potential value of this procedure in filariasis surveillance and differences of opinion about the degree of DEC on provocation warranted this investigation.

Parasitological and house hold surveys were conducted in four endemic areas of Vellore District. The blood test has been carried out only at nights due to its characteristic nocturnal periodicity of microfilariae of Wuchereria bancrofti. Parasitological survey was conducted during 20 00 to 23 00 hrs. The blood smears of 20 mm were collected and current disease status was determined. First the smears were dehaemoglobinized with a few drops of warm water to remove red colouring matter after which the blood smear will look like a white patch on the micro slide. Then the smears were stained with JSB. Such stained blood smears after drying were examined for microfilariae under the low power of the microscope for finding out the species of mf. Oil immersion lens of the microscope was used. Geometric mean density of mf was computed.

DEC was administrated orally during day time between 10 00 - 12 00 hrs to mf carriers at 2mg/kg of body weight. Thick blood smears (20mm') were collected just before DEC administration and at intervals of 30, 60, 90 and 120 min thereafter. The degrees of DEC provocation have been observed as per WHO's protocol.

Out of 20.8% people identified as mf carriers in the endemic villages of Vellore District, 86.8% were provoked with DEC (Table 1). Among those positive cases, 84.6% were females and 91% were males. Considerable provocative effect was noticed in the age groups above 12-18 years. Not even a single
blood smear collected before DEC administration during day time was positive of mf.

Density of mf as detected by DEC provocation test was significantly higher than that detected by night smear examination (Table 2). About 90 worms were noted following DEC provocation where as a maximum number of 54 mf were found during night survey. Studies on the degree of provocation show that the highest mf density was found only during 60 min after DEC provocation whereas it gradually decreased and a notable decrease in mf density was observed in 90 min. DEC provocation is superior to night survey. The average mf density during pretherapy was 22.5 whereas during posttherapy it was 32.16.

The classical filaria triangle consists of man-insect-filarial parasite. To have effective control over filaria the interrelationship between the three components are to be studied in detail. Anil kumar and Dash reported that surveillance is the key note of any disease control programme. On the basis of the above said triangle the present study has been undertaken. In order to overcome so many obstacles during night blood surveys in identifying the mf carriers in very risky areas, the day time provocation tests play a major role. Based on the results in can be concluded that urban areas are more prone to filaria because of high mosquito genic conditions prevalent in these areas. Therefore filaria controlled operations should be carried out in such areas on priority basis.

On the surveillance and control strategy of filaria by DEC, previous worker have recorded two controversial opinions about the degree on provocation. Mc Mohan et al. showed a high degree of sensitivity of the day time test when compared well with the numbers of mf obtained during night blood surveys. In contrast, Patnaik et al. stated that number of mf found in blood samples collected after day time administration of DEC are much smaller than those obtained in regular night blood surveys. The result obtained in our investigation coincides well with the WHO's recommendation.

It can be concluded that the day time provocation should be advocated where the regular night blood survey is not feasible. On the another aspect Patnaik et al. reported that 90 min duration is the optimum time for the worms to appear in the blood during posttherapy. But in the present investigation 60 min posttherapy gave a good result, by the appearance of worms in more density. Further, there is no influence on sex but the age influence was significantly noticed.

Table 1 — Prevalence of filariasis in endemic areas of Vellore District

<table>
<thead>
<tr>
<th>Village name</th>
<th>Month of survey</th>
<th>Number examined</th>
<th>Number positive</th>
<th>MF rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Munjupurput</td>
<td>July/August</td>
<td>401</td>
<td>89</td>
<td>22.1</td>
</tr>
<tr>
<td>Sainathapuram</td>
<td>September/October</td>
<td>232</td>
<td>14</td>
<td>6.0</td>
</tr>
<tr>
<td>Onnupuram</td>
<td>October/November</td>
<td>416</td>
<td>84</td>
<td>20.1</td>
</tr>
<tr>
<td>Chinnapalampakkam</td>
<td>December/January</td>
<td>411</td>
<td>95</td>
<td>19.3</td>
</tr>
</tbody>
</table>

*By 20 mm³ blood smear examination

Table 2 — Comparative study of blood survey & night vs day time provocation and its degree at distinct time intervals

<table>
<thead>
<tr>
<th>Age group</th>
<th>Total number</th>
<th>Number found positive and provoked</th>
<th>Night blood survey (mf density)</th>
<th>Day time provocation count (mf density)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 min</td>
</tr>
<tr>
<td>5-8</td>
<td>24</td>
<td>3</td>
<td>7</td>
<td>—</td>
</tr>
<tr>
<td>9-12</td>
<td>81</td>
<td>7</td>
<td>7.1</td>
<td>—</td>
</tr>
<tr>
<td>13-16</td>
<td>137</td>
<td>18</td>
<td>9.3</td>
<td>11.3</td>
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<tr>
<td>17-20</td>
<td>309</td>
<td>54</td>
<td>12.4</td>
<td>14.4</td>
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</table>

References