PROJECT ON THE CONTROL OF MALAYAN FILARIASIS IN SHERTALLAI - KERALA STATE

VECTOR CONTROL RESEARCH CENTRE

FIELD STATION

INDIAN COUNCIL OF MEDICAL RESEARCH

SHERTALLAI, KERALA

CONTROL OF MALAYAN FILARIASIS IN SHERTALLAI, KERALA STATE

The Indian Council of Medical Research, through one of its National Institutes, Vector Control Research Centre, Pondicherry launched a Technology Mission Project for the control of Malayan Filariasis in Shertallai areas of Kerala State. This project was a new year gift to the people of Kerala, as commented by the then Hon. Dy. Health Minister and the Director General of I. C. M. R. at the time of its inauguration on the 1st January, 1986. The main thrust was at translating research findings into the actual implementation of disease control operation, especially for a disease like filariasis, which can be aptly called a man-made disease. The project is engaged in a multi-sectorial action based community programme aimed at total eradication of Malayan filariasis which has already gained a strong foothold in this area for centuries due to its multiple topographic, ecological and socio-economic factors.

The severity of this disease in Kerala in general and Shertallai in particular is well evident, as the very first filariasis control programme has been initiated in this place, much before Independence by the erstwhile Maharaja of Travancore. Eventhough many attempts were made in the past by various agencies for the control of this disease, they could not make any significant success due to various reasons. The principal lacuna in the earlier programmes was the lack of community involvement which is absolutely essential for the control of a disease like filariasis. The Vector Control Research Centre has designed a strategy linking entire disease control operations with the overall developmental programmes of the State involving the community right from the beginning, so that this disease could effectively be controlled, within a reasonable period of time.

Shertallai taluk with an area of 304 Sq. km, and a population of over 4 lakhs is considered to be the hotbed of this disease since early part of this century. The first scientific survey carried out by M. O. T. Iyengar in 1933 showed an endemicity rate of 48.1%. Also the adult parasite of *Brugia malayi* was described for the first time from a patient in Shertallai by Rao and Maplestone in the year 1940. The vectors of this disease, Mansonioides mosquitoes are well known for their unique breeding behaviour, exclusively in association with floating aquatic weeds, such as *Pistia stratiotes*, *Salvinia molesta* and *Eichhornia crassipes*. The area situated in between Vembanad lake and Arabian sea with vast water bodies chocked with aquatic vegetation is highly conducive for the proliferation of these vector mosquitoes. There are over 75,000 domestic ponds, besides a number of canals/channels and vast areas of seasonal water collections (fallow lands) providing a total surface area of about 18.43 Sq. km. for vector breeding.

The base line data collected by the VCRC in 1986 showed that there were pockets in Shertallai with an endemicity rate over 20% and man biting rate (number of mosquitoes biting/ man / night) about 137.0.

Overall Objectives:

(a) To eliminate foci of transmission of *B. malayi* from Shertallai endemic belt, thereby producing a new generation of children free from filarial infection.

(b) To demonstrate control of vectors of *B. malayi* using environmental and naturalistic methods, with community participation.

(c) Motivate the community to make vector control a people's programme by various means.

(d) Integration of vector control with overall developmental programmes of the state.

Strategies adopted:

The newer Strategies adopted through simple known technology included:

(a) Integrated vector control management through deweeding of ponds, composite fish culture, propagation of alternative green manure, source reduction etc.

(b) Health care delivery by detecting and treating microfilaria positive cases to reduce parasite load in the community and

(c) Health education for enlisting community participation through different media.

FISH CULTURE

Fish culture programme involving the culture of fast growing edible varieties of Carps, such as *Catla catla*, *Cyprinus carpio*, *Cirrhina mrigala*, *Labeo rohita*, *Labeo fimbriatus*, phytophagous fishes viz., *Ctenopharyngodon idella* and *Osphronemus goramy* were advocated in ponds, which were deweeded by the community. The Carp fingerlings were procured from the State Government fish farm and were distributed free of cost. More than 37,600 ponds are already brought under fish culture. This programme enabled the community to improve their financial status while the weed/vector control was achieved as a by-product.

POPULARISING ALTERNATIVE GREEN MANURE

The aquatic weeds were grown by the community as a source of manure for agricultural purposes and this practice was greatly linked with the socio-economic aspects of life of the people. For the beneficiaries who maintained the ponds free of weeds, an alternative better green manure source through the propagation of leguminous plants, Sunhemp (*Crotolaria juncea*) was advocated.

HEALTH CARE DELIVERY

Health Care Delivery is designed with the ultimate goal of eliminating the foci of filariasis transmission from Shertallai. Hence, the avenues created under this component were aimed at parasitological and clinical detection of filariasis cases and imparting appropriate treatment.

A total of 123,769 persons were screened for filariasis by conducting Sample Surveys (31,054), General Community Health Camps (16,222), Filariasis Detection Camps (26,497) Filariasis Detection and Treatment Centres (20,042) and Clinics at the Centre (29,954). As many as 8,035 patients were given necessary treatment.

Impact of therapeutic measures:

Diethyl carbamazine (DEC) and other supportive therapy were imparted to 103 recent oedema (RO) and 132 persistent oedema (PO) cases. Response to therapy (reduction/no progression) was noticed in 88 (85.4%) recent and 102 (77.3%) persistent cases. Regression in oedema was maximum (70.4%) in RO cases, moderate (52.4%) in PO cases without skin change and minimal (36.2%) in PO cases with elephantiasis. A significant correlation was observed between the degree of reduction and number of DEC courses, (upto 5) in RO cases. In PO cases, though DEC courses, duration and initial volume of oedema appeared to influence the oedema regression, the data were at limits of significance by statistical test.

CONTROL OF MALAYAN FILARIASIS- A COMMUNITY ACTION PROGRAMME

The ultimate objective of community participation is the creation of a change in living style that is conducive to control, if not eradication, of the disease. This could only be brought about by an integrated planned programme of action in tune with existing socio-cultural and economic infrastructure. This is being achieved by a strong sociological component which has fanned out to all strata of the community, using various tools and means.

People's Movement:

A number of social and cultural organizations, independent of political influence which were actively functioning in this area were identified to create a 'People's Movement' to undertake a programme for the control of filariasis, which hitherto did not cause much concern for the local community. As a result of this, a 'People's Movement' came into being in the name of 'FILCO Movement' (Filariasis Control Movement) with the catalytic efforts of VCRC. As many as 83 organizations with a membership of about 16,000 have been amalgamated under the banner of this Movement. Now it is a registered body under the "Charitable Societies Act, 1955". The movement recognized filariasis as a social problem in Shertallai, rather than a disease. Its primary objective is to organize filariasis control activities in Shertallai taluk. Such a mass movement for the control of a disease is probably only one of its kind in India.

Student's Movement:

It is well known that health and development are inseparable and they begin with children. The maximum potential for physical, mental and spiritual development vests in children when compared to adults, with whom it reached a static stage. To orient the people towards health consciousness, it is necessary to incorporate health education in the school and college curriculum. Health education carried out in all the Educational Institutions of the area helped in creating a sense of responsibility among them, to actively participate in vector control programmes and resulted in the birth of 'Students' Filariasis Control Clubs' [SFCC], which at present have a membership of over 3,000 volunteers from 30 secondary schools.

TECHNOLOGY TRANSFER TO THE COMMUNITY

The extent of technology transfer to the community over a period of time is the real measure of progress of the programme. The newer strategies developed by the VCRC through the known technologies against filariasis were simple and acceptable to the community and therefore, they gradually absorbed these strategies into the main stream of their day to day life.

a) Bankable scheme for Fish Culture:

Convinced by the multifarious gains of the fish culture, the National Bank for Agriculture and Rural Development [NABARD] has brought this scheme under the purview of their activities. The total financial outlay sanctioned for the scheme in the first phase [1989-90 and 1990-91] is Rs. 57.5 lakhs. The expected total financial return to the community will be to the tune of Rs. 1.9 crores when this scheme is extended to the entire taluk. A situation has been created where the community can take care of fish culture, with the assistance of Banks, which eased off the burden on VCRC.

b) Vector Control linked with Agricultural Development Programme:

The green manure programme was successfully demonstrated in a village, Ponnittuseri (Population : 2,500) under 'Sunhemp Village Project', a collaborative venture of Krishi Bhavan, the VCRC and Farmer's Club, a voluntary organization of farmers of the area, towards 'Complete Coconut Care Programme' undertaken by the Agricultural Development Agencies. Through this programme, the villagers were ensured of a better alternative green manure for agriculture, while they got rid of the noxious aquatic weeds. Further, the enhanced coconut yield is estimated to fetch an increased profit of Rs. 10 lakhs per year, for the community.

c) Filariasis Detection and Treatment Centres (FDTC):

The parasitological screening and subsequent treatment of 'mf' positive cases, hitherto carried out by the Governmental agencies are now extended to ordinary motivated citizens from voluntary organizations. Volunteers possessing middle level education were given intensive training on these lines, which enabled them to open FDTC in their respective villages. There are 75 such centres right now spread over to the entire taluk, actively engaged in this programme. As many as 20,042 blood smears were collected by these centres. 209 persons detected positive for microfilaraemia, were given treatment with a course of DEC.

d) Low Dose DEC-Mass Drug Administration- "BY THE PEOPLE FOR THE PEOPLE":

Community volunteers who are readily acceptable to the local public were identified through the member organizations of FILCO Movement. They were given a thorough orientation in DEC administration, which not only helped the people to realise the importance of chemotherapy but also to accept and involve themselves actively in the modified programme of action - "BY THE PEOPLE FOR THE PEOPLE". Towards this venture 103 volunteers were engaged in giving Mass Drug Therapy of Low Dose DEC in a highly endemic locality (Mararikulam, Population: 7,507) of Shertallai, as a prophylactic measure.

EVALUATION AND FEEDBACK

The ultimate aim of a vector borne disease control programme is the liquidation of parasitaemia in the population and a reduction of the vector population to the tolerable limits. Hence, the efficacy of the control activities was constantly monitored employing standard techniques and the shortcomings, if any, were rectified. A survey of the pre-primary and primary school children in the age group of 0-10 years before and after launching the control operations showed a reduction in the incidence of the disease [2.47% to 1.17%]. The impact of intensive chemotherapy was evidenced by the reduction of microfilaraemia by 79.14%.

The effectiveness of weed/vector control was reflected in the drastic reduction of man-vector contact [MBR] from 137 to 18.45. The infection and infectivity of the vector mosquitoes were also brought down from 7.5% and 2.7% to 0.99% and 0 respectively.

ONGOING RESEARCH PROGRAMMES

- Influence of biotic and abiotic factors on the breeding habits of Mansonioides mosquitoes.
- Ecology and Bionomics of Mansonioides mosquitoes, viz., *Mansonia annulifera*, *M. uniformis* and *M. indiana*, the vectors of Malayan filariasis,.
- Population dynamics of the vectors - fecundity - immature duration/survival - gonotrophic cycles - parity status - adult survival-net reproduction rate [Ro]-finite rate of increase etc.
- Transmission potential of Mansonioides - Risk of Infection Index (De Meillon) - Annual Transmission Index (Baye and Gurian)-Annual Transmission Potential- Critical density etc.
- Feasibility studies on the use of biocontrol agents and Insect Growth Regulators against immatures of Mansonioides mosquitoes.
- Studies on the culture and biology of *Osphronemus goramy*, an endangered phytophagus fish.
- Evaluation of the larvivorous potential of fresh water fishes both in laboratory and under simulated field conditions.
- Feeding behaviour and food preference of fishes of public health importance.
- Development of a rating system for the selection of appropriate fishes for Mansonioides control.
- Pattern of change in Infection and Disease prevalence.
- Post treatment observations on the acute and lymphoedema cases.
- Longitudinal studies on microfilaria carriers and lymphoedema cases.
- Rationale on the use of DEC against filariasis.
- Clinical spectrum of Malayan filariasis.
- Socio-economic factors influencing the persistence and control of Malayan filariasis.
- Impact of Health Education and the role of community on a self-help basis in filariasis control programmes.

SCIENTIFIC STAFFING OF THE PROJECT

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31-12-1989