Abstract

The study was carried out in two hamlets in Lunugamvehera irrigation project situated in Lunugamvehera DDHS area in the Hambantota district in Sri Lanka. The intervention component of the study extended from January 1988 to December 1994. The impact of indoor residual spraying and insecticide treated nets on malaria control was assessed independently. The impact of the two methods for different house types, age and sex groups, and on the vector mosquito population was studied.

The study was conducted in two phases, pre-intervention phase and post-intervention phase. A demographic survey and geographic reconnaissance were done in the pre-intervention phase. Community Health Workers (CHWs) were selected and Village Health Committees were also established during the pre-intervention period. During the intervention period indoor residual spraying (IRS) with 5% malathion was carried out in hamlet 2 RB while nets treated with permethrin were used in hamlet 3 RB. During the study period malaria infections were monitored at Lunugamvehera Peripheral Unit by Activated Passive Case Detection (APCD). Entomological investigations were carried out in both hamlets from 1991 to 1993. Outdoor prevalence was monitored by Cattle Baited Net Trap (CBNT) and Cattle Baited Hut Trap (CBHT) collections while indoor prevalence was monitored by pyrethrum spray sheet collections. Indoor and outdoor man biting rates were also monitored. Susceptibility tests for 5% malathion and 0.25% permethrin and bioassay tests on different surfaces were carried out. The participation of the community was promoted through CHWs to carry out vector control measures, follow up of malaria cases and referring fever cases to the Lunugamvehera hospital for blood smear examination. Coverage of IRS in hamlet

2 RB was above 75% while the population protected with insecticide treated nets was over 70%.

In 1992 and 1993 the Annual Parasite Incidence (API) in hamlet 3RB was higher than the API of hamlet 2 RB (with IRS), though the difference was not statistically significant. However, in 1994, the API of hamlet 2 RB was significantly higher than that of hamlet 3 RB, a major reason for which could be vector resistance to 5% malathion.

During the pre- and post- intervention periods there was no significant difference in the indoor resting densities of *An.culicifacies* between the two hamlets. Though *An.subpictus* was the most abundant indoor resting species, highest indoor biting rate was observed in *An.culicifacies*. The protection afforded against malaria by ITNs in males was less than that of females probably due to poor usage of nets by males. IRS provided better protection for different age-sex groups.

Poorly constructed houses which are preferred by *An.culicifacies* , the major vector for malaria in Sri Lanka, are not adequately protected by IRS due to sorption. However, IRS provides good protection for the people who live in better constructed houses. There was no significant difference in the APIs of two hamlets by age groups except the 6-10 year age group. ITN provide a better protection for this age group.

In 1994, the sudden emergence of resistance of *An.culicifacies* to malathion resulted in an increase in the incidence of malaria in hamlet 2 RB. Though it could not be confirmed, it is also likely that a sibling species E of *An.culicifacies,* may have played a role in the transmission of malaria in the study hamlets of the Lunugamvera development project.