

CORRESPONDENCE

Insecticide-impregnated mosquito nets: An alternative strategy for malaria control

Malaria is emerging as a major public health problem in the northeastern states of India. Outbreaks due to malaria are of frequent occurrence, especially in forest fringe/foothill areas bordering Bhutan, Bangladesh and Myanmar. *Plasmodium falciparum* is the predominant parasite species (>70%) and is responsible for high morbidity and mortality. During 1995 alone, more than 200 deaths occurred due to *P. falciparum* infections in the Brahmaputra valley of Assam.

To contain the disease, the Malaria Research Centre of the Indian Council of Medical Research (ICMR) has field-tested 'insecticide-impregnated nets' as an alternative strategy for the northeastern sector. Village-scale field trials with deltamethrin-impregnated nets (@25 mg/m²) were conducted in Sonapur PHC of Kamrup district, Assam (typical malaria-endemic area of foothills) as an intervention measure against *Anopheles minimus* transmitted malaria. Over a 2-year study period (1988-90), there was a notable decline in the number of *P. falciparum* cases, and malaria incidence decreased by 70% in the intervention villages (impregnated net users) when compared with the baseline year (1987) data. In these villages, there was a marked reduction in the vector density (*An. minimus*), and the man-mosquito contact was checked to a greater extent. Of the various netting materials, i.e. cotton, jute, nylon, the latter were more insecticidal

when impregnated at the same dosage. Owing to decreased morbidity due to malaria, and lack of nuisance due to other insect pests, community participation was forthcoming.

Based on the success of these trials, the Government of India launched a pilot project study in all seven sister states of the northeastern region. One hundred thousand mosquito nets impregnated with deltamethrin (2.5% flow) were distributed free through the primary health care in malaria-ridden pockets of all seven states beginning 1996. The public response was overwhelming and additional demands were generated by the respective State Health Directorates to cover additional population groups having greater risk of acquiring malarial infection. These insecticide-impregnated nets are now popularly known as 'medicated nets'.

The chemical used for impregnation was a synthetic pyrethroid namely deltamethrin (2.5% K-othrine, flow formulation). The procedure for impregnation is very simple and can be done by communities themselves. Only 10 ml of K-othrine is required for a single mosquito net of 10 m² surface area, i.e. one ml per square metre to get the target dose of 25 mg/m². The required amount of insecticide is diluted in approximately 350 ml of water which is just sufficient for its complete absorption by a single nylon/polyester net. The mosquito net thus soaked is spread on a non-absorbent plas-

tic sheet for drying in shaded area. Use of hand-gloves is recommended during impregnation to avoid direct contact with the concentrated formulation. The mosquito net thus impregnated repels vector mosquitoes and kills those which rest on it. It ensures protection for six months (if not washed) not only against vector mosquitoes but also guards against other insect pests, viz, cockroaches, house flies, head lice, bedbugs, spiders, etc. Re-impregnation is advisable every six months for better results.

This strategy is simple, cost-effective, environment-friendly, appropriate, sustainable and involves communities which is very vital for the success of the programme. To combat the malaria menace, health education has a definite role to play at the grassroot level. For this, intersectoral cooperation is of paramount importance for effective translation of this technology and to ensure maximal community compliance. This integrated approach coupled with early case detection and prompt treatment can only make this programme a grand success for effective malaria control, particularly in tribal-dominated, forested, difficult areas with high level of receptivity.

VAS DEV

Malaria Research Centre,
P.O. Sonapur, Kamrup,
Assam 782 402, India