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Short Communication

Pyrethroid-impregnated bed nets in the malaria control strategy at community level

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As early as 1910 Ross recommended bed nets as a protection against infective bites of vector anophelines. Bed nets also provide an efficient protection against many other biting insects and are an element of comfort. But despite this protective effect they did not significantly decrease the risk of infection and of morbidity in highly endemic areas (Snow et al., 1988a).

Impregnation of bed nets with 'knock-down acting' pyrethroid insecticides (deltamethrin, permethrin) with a long residual effect improved their capacity for protecting sleepers even if the net is in poor condition or not properly maintained, as is often the case in the field. Significant decreases in parasitaemia and in the incidence of malaria cases were indeed observed among children sleeping under impregnated nets in The Gambia (Snow et al., 1987), Papua New-Guinea (Graves et al., 1987) and Burkina Faso (Carnevale et al., 1988).

The main advantage of impregnated nets is not only the direct protection of sleepers but also its potential as a tool for a mass campaign when used by most of the community members. Bed nets act as traps baited by sleepers attracting and, when impregnated, killing selectively the anthropophilic mosquitoes. Mosquitoes are killed before biting and not after as is the case in house spraying, which is an important entomological and psychological advantage; in this way the possible irritant and repellent effect of the insecticide is synergistic with its lethal effect in breaking the man/vector contact. Mosquito populations, and above all their mean longevity, have been drastically reduced. As a consequence of this protective and insecticide action, malaria incidence has decreased by more than 95% in a district of China where the entire population slept under deltamethrin-impregnated nets (Li Zuzi et al., unpublished). In a hyperendemic area of Burkina Faso we have observed that the collective use of impregnated nets in a village of 1200 people reduced the transmission by 90% even for those not sleeping under nets (Carnevale et al., 1988).

As already emphasized (Mouchet, 1987), pyrethroid-impregnated bed nets could be a major weapon for malaria control when used by most of the community

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members. In this perspective it should be pointed out that the experiment should be made in areas as large as possible to avoid the entry of mosquitoes from untreated areas. In order to reveal the effect of mass scale use of impregnated bed nets it must be evaluated not only with the entomological data but also, as done in the above-mentioned trials, with epidemiological data including clinical aspects; the latter constituting the final objective of malaria control. The impregnation is cheap, the technique is simple and can be performed in the framework of Primary Health Care with community participation (Snow et al., 1988b). Of course there could be some problems in providing inhabitants with bed nets and other problems due to their reluctance to sleep under nets in areas where they do not use them yet. So far no resistance to pyrethroid has been observed among vector anophelines but it could occur. Therefore further research must be conducted both on the acceptability of bed nets and on other classes of insecticide compounds. It must be underlined that this method is of particular interest in areas of malaria drug resistance where the treatment of malaria attack could outstrip the local therapeutic facilities.

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