Collateral Benefit of Deltamethrin Impregnated Mosquito Nets

Dear Editor,

Joshi et al (2003) have described the impact of deltamethrin-impregnated mosquito nets (DIMN) on malaria incidence, during a field trial [1]. The collateral benefit of reduction in mosquito densities achieved during the trial is presented.

For detailed methodology, readers are requested to consult the original paper [1]. During the pretrial year (Jul 96-Jun 97), a base line data on mosquito densities was collected at the trial station (TS) and control station (CS). Mosquito catching was done at designated indoor mosquito catching stations as well as at random locations for one hour twice a week, between 0530 to 0630 hrs by hand catch for 15 min per station. The collections were brought to the lab and sorted by genera. No distinction was made between sexes and species. The indoor resting mosquito density of mosquitoes per 10 man-hour catch was calculated. From this data monthly mosquito density (MMD), annual mosquito density (AMD) (sum of the monthly mosquito densities for 12 months) and annual mean mosquito density (AMMD) was derived. *Aedes* genus was excluded due to extremely low density throughout the trial phase. Parameters like mosquito biting rate etc were not included because of administrative limitations. During the trial years (July 1997-June 1999) three rounds of deltamethrin impregnation of the mosquito nets were carried out at TS, in lieu of residual spraying. In the CS, all antimalaria operations were carried out undisturbed.

MMD declined progressively every month during the trial years for *Culex* and *Anopheles*. After December 1998, no *Anopheles* mosquito was caught in the sample, co-relating with the decline in malaria cases in the station [1]. Overall AMD declined by 75% (from 76.74 in 1996-97 to 18.8 in 1998-99) and 53% (from 1341.8 in 1996-97 to 629.01 in 1998-99) in the TS for *Anopheles* and *Culex* respectively. The decline in AMD for *Anopheles* and *Culex* mosquitoes was found to be statistically significant. The lesser

decline for *Culex* may be due to wide spread breeding of *Culex* in the open drains and septic tanks in the station acting as a constant source of mosquitoes, in spite of rapid elimination of *Culex* mosquitoes, or greater susceptibility of *Anopheles* to DIMN. In the CS, AMD increased by 13.64% and 6.8% respectively for *Anopheles* and *Culex* (observation not significant) in spite of all antimalaria operations.

AMMD for *Anopheles* (Table 1) and *Culex* (Table 2) also showed a statistically significant progressive decline in TS during the trial years.

In addition to mosquito nets, impregnated curtains can also give beneficial results. Poopathi et al (1995) used pyrethroid impregnated Hessian curtains and found 80-95% reduction in indoor resting density of *Culex quinquefasciatus* for at least 14 weeks [2]. Similar approaches are also required to be tested in the service conditions.

It is recommended that in addition to malaria control, DIMN should be introduced in the army to reduce mosquito nuisance in general and epidemic like situations in particular.

References

1. Joshi RM, Ghose G, Som TK, Bala S. Study of impact of deltamethrin impregnated mosquito nets on malaria incidence at a military station. *MJAFI* 2003;59:12-14.
2. Poopathi S, Ragunath Rao D. Pyrethroid impregnated Hessian curtains for protection against mosquito indoors in South India. *Med Vet Entomol* 1995;9:169-75.

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Table 1

Annual mean MD for anopheles in trial and control stations

Sr. No.	Year	Trial station		Control station		t	P
		Mean	SD	Mean	SD		
1.	96-97	6.39	6.07	6.23	3.30	0.07	> 0.05 (not significant)
2.	97-98	2.46	4.13	6.24	3.31	2.46	< 0.05 (significant)
3.	98-99	1.57	2.25	7.08	3.36	4.72	< 0.001 (significant)

Table 2

Annual mean MD for culex in trial and control stations

Sr. No.	Year	Trial station		Control station		t	P
		Mean	SD	Mean	SD		
1.	96-97	111.82	28.98	95.68	24.31	1.47	> 0.05 (not significant)
2.	97-98	83.76	25.98	99.99	19.46	1.73	< 0.05 (significant)
3.	98-99	52.42	11.65	102.02	22.44	6.82	< 0.001 (significant)