Effectiveness of Transfluthrin-Coated Inflammable-Fumes Insecticide-Paper (Rambo™) in the prevention of malaria in Kano, Nigeria

Y.M. Abdulsalam 1*, H. Muhammad 2, A. Abduljalal 1, Z. Iliyasu 3, B.M. Muhammad 3, M.M. Bello 1, I.A. Sadiq 3, M. Ma’arouf 4, A.G. Habib 5

1 Bayero University, Kano, Kano, Nigeria
2 Bayero University, Kano, Kano, Nigeria
3 Aminu Kano Teaching Hospital Kano/Bayero University Kano, Kano, Nigeria
4 Aminu Kano Teaching Hospital Kano, Kano, Nigeria
5 Bayero University Kano, Kano, Nigeria

Background: A 15-months community Randomized Controlled Trial was conducted with the aim of assessing effectiveness of Transfluthrin-Coated Inflammable-Fumes Insecticide-Paper (TCIP) [RamboTM] on indoor mosquitoes and malaria.

Methods & Materials: The study was conducted in two communities, Panshekara and Danbabe, Kano, Nigeria randomly selected as intervention and control respectively. 150 households (HHDs) were systematically selected in each of the two and their doors and windows were ‘netted’ with mesh- wire. In the intervention community there were ‘netted-alone’ and ‘netted + TCIP’ administered HHDs. Participants were allowed use of Insecticide-Treated-Mosquito-Nets. Additional 20 HHDs were randomly selected within the two communities as internal controls and were neither ‘netted” nor administered TCIP. Fever, blood film microscopy for malaria parasite, haematocrit and entomological indices (indoor mosquito collection and determination of species at breeding sites) were conducted quarterly. Pyrethrum Spray Collection (PSC) technique was used to collect adult mosquitoes monthly from rooms in both communities. Main malaria vector species were identified using molecular techniques (PCR). ELIZA was used to identify circumsporozoite protein (CSP) of Plasmodium falciparum.

Results: A total 2565 persons were studied in Panshekara (1208) and Danbabe (1357). There was declining trend in malaria through 4 quarters in Panshekara compared to baseline (χ2-trend, p = 0.02) and slight reduction in proportion with anaemia. In Panshekara, a total of 1592 Culex species were collected out of which 911 (57.2%) were from the internal control, 440 (27.6%) were from the screened ‘netted’ and 241 (15.1%) from ‘netted + TCIP’ treated HHDs. 396 Anopheles gambiae vectors were collected out of which 339, 27 and 30 were from the control, ‘netted’ and ‘netted + TCIP’ treated sites respectively. In comparison to the baseline pre-netting phase, wire netting alone provided 51% protection against the nuisance of Culicine mosquitoes, while netting plus TCIP provided 73% protection against Culicine mosquitoes. The main malaria vectors species were An. gambiae s.s and An. arabiensis but An. funestus could not be analysed further. CSP of P. falciparum were seen in all the 3 vector species.

Conclusion: Very slight reduction in malaria and anaemia was observed. Protection conferred by TCIP was modest against Culex spp but small against the malaria vectors. TCIP complimented