A household randomized, controlled trial of the efficacy of 0.03% transfluthrin coils alone and in combination with long-lasting insecticidal nets on the incidence of Plasmodium falciparum and Plasmodium vivax malaria in Western Yunnan Province, China

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Mosquito coils are the most commonly used household insecticidal product in the world with sales exceeding 50 billion coils, used by two billion people worldwide annually. Despite strong evidence that coils prevent mosquito bites a systematic review concluded that there is no evidence that burning mosquito coils prevents malaria acquisition. Therefore, the current trial was designed to measure and compare prevention of malaria infection by mosquito coils or long-lasting insecticidal net (LLIN) or a combination of the two in Yunnan, China in the Greater Mekong sub-region.; A four-arm single blind household-randomized design was chosen as coils emanate insecticide throughout the household. Households enrolled at baseline were randomly allocated by the lottery method to one of the four intervention arms: (i) nothing, (ii) 0.03% transfluthrin coils alone, (iii) deltamethrin long-lasting insecticide treated nets, (LLINs) alone or (iv) a combination of transfluthrin coils and deltamethrin LLINs. All household members were recruited to the study, with only those households excluded with pregnant or breastfeeding mothers, members with chest complaints or allergies or members that regularly slept away from home. The main outcome of interest was Plasmodium falciparum malaria prevalence detected by rapid diagnostic tests (RDTs) during six repeated monthly cross-sectional surveys. The secondary outcome of interest was the effect on Plasmodium vivax prevalence detected in the same way.; A total of 2,052 households were recruited into the study, comprising 7,341 individuals The odds ratios of testing positive by RDT with P. falciparum or P. vivax were >75% lower for all intervention arms compared with the control arm. Coils alone provided 77% protection (95% CI: 50%-89%), LLINs provided 91% protection (95% CI: 72%-97%) and the combination of coils and LLINs provided 94% protection (95% CI: 77%-99%) against P. falciparum compared with the control arm. There was no statistically significant difference between the protective efficacies of the different interventions.; This is the first robust clinical evaluation of transfluthrin mosquito coils as a means to reduce malaria and the high degree of infection prevented would indicate they represent a potentially highly effective tool, which could be integrated into larger vector control programmes.; ClinicalTrials.gov Identifier: NCT00442442, March 2007.

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