

Cluster randomised trial and development of a sandfly sex pheromone lure to reduce *Leishmania infantum* infection

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Introduction

Vector control tools are needed to combat leishmaniasis. A semi-synthetic version of a *Lutzomyia longipalpis* aggregation/sex pheromone (9-methylgermacrene-B) has been developed, and shown efficacy to attract sandflies in the lab and to chicken sheds in the field. Here, we present results from a cluster-randomised trial performed in Brazil where we test the efficacy of the pheromone deployed with insecticide, a novel lure-and-kill intervention, to reduce leishmaniasis transmission to the canine reservoir.

Aim

Investigate the efficacy of sandfly sex pheromone baited + insecticide treated chicken roosts to reduce transmission of *Leishmania infantum* among the reservoir population (dogs).

Methods

We conducted a cluster-randomised trial across 42 communities in Brazil. Pheromone lures plus insecticide were applied in 14 communities, and outcomes compared to that of 28 other communities that received either a placebo (sham lure + insecticide) or deltamethrin-impregnated collars fitted to dogs. We quantify the primary intervention effects by comparison of the number of uninfected dogs that seroconverted in each arm over the course of the 2-year trial.

Results

A reduction in canine incidence is attributed to the pheromone + insecticide intervention, which is consistent across the levels of hierarchical analysis, though the errors are broad. The performance of the pheromone followed similar patterns as the collar arm which significantly reduced seroconversion incidence.

Conclusion

These data represent the first trial of a synthetic vector pheromone applied in public health control, and the first cluster-randomised trial of dog collars in Brazil. Both methods show potential for the control of zoonotic visceral leishmaniasis in the Americas; developments of the pheromone lure-and-kill strategy are underway.