Lethal ovitraps and dengue prevention: report from Iquitos, Peru

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Effect of papaya leaf extract on platelet count in dengue fever: a randomized controlled trial (PLEAD Trial)

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Background: Thrombocytopenia is a prominent feature of dengue fever and dengue hemorrhagic fever. Papaya leaves have been used by many patients due to their perceived beneficial effect on platelet count. However, scientific data on this beneficial effect is lacking.

Methods: A single centre, single blinded, randomized placebo controlled trial was conducted at the Department of Medicine, Jinnah Hospital Lahore. Adult patients admitted with diagnosis of dengue fever (DF) or dengue hemorrhagic fever (DHF) and platelet counts $\leq 50 \times 109$/L were eligible for the study. After obtaining written informed consent participants were randomly assigned to either treatment or control group. 5ml of papaya leaf extract in syrup form was given twice daily for four days to treatment group and placebo solution was given to control group. Platelet counts were checked on daily basis. Outcome was measured in terms of platelet increments from baseline.

Results: Thirty-nine (39) patients were enrolled and 28 (72%) were male. 19 (48.7%) patients received papaya leaf extract. Mean baseline platelet counts of treatment and control group were comparable, 36.2×109/L and 34.1×109/L respectively. Mean platelet counts at the end of treatment were 142.3×109/L and 116.5×109/L in treatment and control group respectively ($p = 0.182$). Platelet count normalized (i.e. $\geq 150 \times 109$/L) in 9 (47.4%) patients in treatment group and 5 (25%) patients in control group ($p = 0.191$). Similarly, no significant differences in mean platelet count increments from baseline were found between treatment and control group on day 2 (23.7×109/L vs 15.9×109/L, $p = 0.242$), day 3 (42.6×109/L vs 35.1×109/L, $p = 0.424$), day 4 (71.6×109/L vs 58.4×109/L, $p = 0.309$) and day 5 (106×109/L vs 82.3×109/L, $p = 0.189$). No significant adverse event occurred in either group.

Conclusion: Papaya leaf extract, in this study, did not show any effect on platelet count in dengue fever.

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Lethal ovitraps and dengue prevention: report from Iquitos, Peru

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Background: Dengue viruses are transmitted by container-inhabiting *Aedes (Stegomyia)* mosquitoes, primarily *Aedes aegypti* and also *Aedes albopictus*. After female mosquitoes acquire the virus when taking blood from an infected human host, they use a variety of cues to identify potential oviposition sites, where they must deposit eggs before taking another bloodmeal. For several years, we have worked to identify those semiochemical cues and to develop a more effective lethal ovitrap (Attractive Lethal OviTrap = ALOT) for *Ae. aegypti* control, with concentration on oviposition attractants and stimulants. Here we describe the ALOT, as well as focus group and modeling work designed to identify important trap attributes. We will also present entomological and dengue incidence data from an ongoing field trial in Iquitos, Peru.

Methods: Methods to be discussed include large cage trials, and field trials comparing areas with ALOTs to those without. In cage trials, efficacy endpoints included mortality, eggs oviposited in the ALOT and eggs retained by dead females. In small scale field trials, efficacy endpoints included eggs deposited in non-lethal ovitraps, number of female mosquitoes collected, and female gravid and parous status. In the large scale field trial, efficacy is measured by entomological indices (adult index, etc.), by gravid and parous status of female mosquitoes, and by dengue incidence.

Results: In large cage trails we consistently have shown 90-98% efficacy of the ALOT compared to normal ovitraps and to typical backyard containers; in two field trials based in New Orleans, Louisiana, we have shown that there are significantly fewer gravid and parous females in areas treated with ALOTs, as compared to untreated areas. Currently, in Iquitos, Peru we are conducting a large scale efficacy trial to assess the ability of the ALOT to reduce dengue transmission.

Conclusion: Our results suggest that the ALOT can impact virus transmission because it reduces the number of epidemiologically important (e.g., previously blood-fed) mosquitoes. The ALOT is not designed to be a stand-alone tool for dengue vector control; it should be used as part of an integrated management program (e.g., source reduction, active case surveillance, targeted insecticide treatment, etc).

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