The Effectivity Test of Transflutrin, Praletrin and Dimeflutrin in Electrical Liquid Mosquito Vaporizers Against Adult *Aedes aegypti*

Stefanie Kusuma[1], Tri Baskoro Tunggul Satoto[2], Elsa Herdiana Murhandarwati[2],

[1]Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada

[2]Department of Parasitology, Faculty of Medicine, Universitas Gadjah Mada

ABSTRACT

Background: *Aedes aegypti* is the main vector for the transmission of Dengue virus. According to WHO, more than 100 countries are labelled as endemic countries. Dengue is one of major health problem in Indonesia because the number of dengue cases are keep increasing each year. Therefore, *Aedes aegypti* control is important to overcome this health problem. Active ingredients in each liquid mosquito vaporizers are not similar and every active ingredients has different power. For this reason, the effectivity test towards transfluthrin, pralethrin and dimeflutrin in liquid mosquito vaporizers is significant to be conducted.

Objective: To compare knocdown time 50 (KT_{50}), $KT_{95,}$ and mortality percentage of *Aedes aegypti* between transflutrin 12.38 g/l, praletrin 13.16 g/l, and dimeflutrin 6.1 g/l.

Methods: Quasi experimental with post test only group design. Mosquitos were divided in 4 groups, the first group was the control group, the second group was transflutrin group, the third group was praletrin group, and the fourth group was dimeflutrin group. Each group of mosquitos were monitored in 60 minutes or until they reached knockdown time 95 if in 60 minutes knockdown time 95 could not be obtained. After 60 minutes, the mosquitos were transferred into clean paper cups and mortality of each group was recorded after 24 hours. All statistical analysis was performed using a statistical analysis computer program, SPSS 21.

Results: *Aedes aegypti* exhibited various knockdown-time 50 (KT_{50}), ranging from 43.33 minutes, 56.67 minutes, to 26.67 minutes for transflutrin, praletrine and dimeflutrin respectively. Knockdown-time 95 (KT_{95}) also showed various results, from 56.67 minutes for transflutrin, 73.33 minutes for praletrin, and 33.33 minutes for dimeflutrin. Percentages of mortality reached 68.00%, 62.67% and 70,67% for transflutrin, praletrin, and dimeflutrin in chronological order. In addition, there were statistically significant differences for KT_{50} with $p=0.033$ ($p<0.05$) and KT_{95} with $p=0.025$ ($p<0.05$). On the contrary, there was no significant difference for percentage of mortality with $p=0,784$ ($p>0.05$).

Conclusion: There were differences for knockdown-time 50 (KT_{50}) and KT_{95} among transflutrin, praletrin and dimeflutrin against *Ae. aegypti*, was not found significant difference of percentage of mortality from transflutrin, praletrin and dimeflutrin

Keywords: *Aedes aegypti,* dengue, electrical liquid vaporizer, transflutrin, praletrin, dimeflutrin.

.

INTISARI

Latar Belakang: *Aedes aegypti* merupakan vektor utama untuk transmisi virus dengue. Berdasarkan WHO, lebih dari 100 negara dinyatakan sebagai negara endemik dengue. Demam Berdarah Dengue masih menjadi masalah besar yang perlu diperhatikan di Indonesia dikarenakan terjadi peningkatan jumlah kasus tiap tahunnya. Dengan masih banyaknya permasalahan kesehatan yang terkait dengan virus dengue, maka kontrol terhadap *Aedes aegypti* sangat diperlukan. Tidak semua obat nyamuk elektrik komersial menggunakan kandungan bahan insektisida yang sama. Kandungan insektisida dalam obat nyamuk elektrik tersebut dapat mempunyai daya kendali yang berbeda terhadap vektor *Aedes aegypti*. Sehingga perlu dilakukan penelitian uji banding kandungan bahan insektisida dalam obat nyamuk elektrik komersial.

Tujuan Penelitian: Untuk mengetahui perbedaan waktu mencapai *knockdown time* 50 (KT50), KT95, dan persentase mortalitas nyamuk *Aedes aegypti* antara transflutrin, praletrin, dan dimeflutrin.

Metode: *Quasi experimental with post test only group design*. Nyamuk *Aedes aegypti* dibagi menjadi 4 kelompok, kelompok pertama merupakan kelompok kontrol, kelompok kedua merupakan kelompok transflutrin 12,38 g/l, kelompok ketiga merupakan kelompok praletrin 13,16 g/l, dan kelompok keempat merupakan kelompok dimeflutrin 6,1 g/l. Setiap kelompok diamati selama 60 menit atau sampai mencapai *knockdown time* 95 (KT_{95}) jika dalam 60 menit KT_{95} tidak dapat tercapai. Setelah 60 menit, nyamuk dipindahkan ke tempat pemulihan dan kematian dicatat setelah 24 jam. Analisis statistik menggunakan SPSS versi 21.

Hasil Pengamatan: *Knockdown-time* (KT_{50}) rata-rata transflutrin, praletrin, dan dimeflutrin terhadap *Ae. aegypti* secara berturut-turut adalah 43,33 menit, 56,67 menit, dan 26,67 menit. *Knockdown-time* (KT_{95}) rata-rata transflutrin, praletrin, dan dimeflutrin adalah 56,67 menit, 73,33 menit, dan 33,33 menit. Perbedaan KT_{50} dan KT_{95} memberikan hasil yang signifikan dengan nilai $p=0,033$ ($p<0,05$) dan $p=0,025$ ($p<0,05$). Persentase mortalitas transflutrin, praletrin, dan dimeflutrin terhadap nyamuk *Ae. aegypti* sebesar 68,00%, 62,67%, dan 70,67%. Perbedaan pada persentase mortalitas *Ae. aegypti* tidak signifikan dengan nilai $p=0,784$ ($p>0,05$).

Kesimpulan: Terdapat perbedaan *knockdown-time* 50 (KT_{50}) dan KT_{95} yang signifikan antara transflutrin, praletrin dan dimeflutrin. Persentase mortalitas tidak menunjukkan perbedaan signifikan antara transflutrin, praletrin, dan dimeflutrin.

Kata Kunci: *Aedes aegypti,* dengue, obat nyamuk elektrik cair, transflutrin, praletrin, dimeflutr