

Scientific Studies:

Spray That Mosquito?

“Health effects are present long before signs of poisoning occur.”

Researchers at the Neurotoxicology Division of the National Health and Environmental Effects Research Laboratory performed a critical analysis of research literature on pyrethroid-induced neurobehavioral toxicity and other adverse effects in adult animals.

Pyrethroids are a class of synthetic chemical insecticides similar to the natural pesticide pyrethrum. They are commonly used for mosquito control.

All pyrethroids in the examined literature produced a decrease in motor activity. Motor activity is described as the physical activity of an organism that is associated with behavior.

Some pyrethroid exposure reduced grip strength and impaired coordination. Pyrethroids have been shown to impair operant responding in animals. An operant response is a learned response to operant conditioning, a type of learning in which a behavior is strengthened (occurs more frequently) when it's followed by reinforcement and weakened (happens less frequently) when followed by punishment.

Certain pyrethroids cause an increase in startle response, while others cause a decrease in startle response. Thresholds for motor activity decline were found in pyrethroid doses well below those that would produce signs of poi-

soning. Therefore, health effects are present long before signs of poisoning occur, if they occur.

If these low dose effects have been shown, it is plausible that any exposure at all is too much. If pyrethroids bioaccumulate, several low dose exposures could eventually lead to poisoning.

Pyrethroid poisoning may disrupt the endocrine system by mimicking estrogen. In males, this can lead to lowered sperm count. These insecticides have also been shown to damage the thyroid gland. In toxic doses, tremors, lack of coordination, and behavioral changes occur. Children are at much greater risk than adults.

Fortunately, many alternatives are available, including some simple measures. Protective clothing and screening windows and porches is very effective at eliminating mosquito bites. Removing all sources of standing water limits breeding. Adding soap to any standing water, if the water cannot be removed, also limits breeding. These simple methods can go a long way towards personal protection and mosquito reduction.

Reference

Wolansky MJ, Harrill JA. Neurobehavioral toxicology of pyrethroid insecticides in adult animals: A critical review. *Neurotoxicol Teratol.* 2007 Nov 17.

