Investigating the Effects of Levetiracetam on Seizures in Shaking-Sensitive Drosophila melanogaster

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Levetiracetam, otherwise known as Keppra, is an anti-seizure medication. It is used to prevent seizures in people who have epilepsy. Due to the fact that Keppra is a preventative medication, we wanted to find out how the medication would affect the seizures themselves. To test how Keppra affects seizure severity and duration, we used shaking-sensitive fruit flies (Drosophila melanogaster) as a simple representation of an epileptic neurological system. If the fruit flies ingest the medication, then their seizures should decrease in severity and duration. We separated the flies into six different vials: three vials of normal food and three vials of 1.26 mg of Keppra mixed into their food. Then, we let the flies ingest the medication for seven days. Finally, after seven days, we separated the flies into individual vials without anesthetizing them and induced seizures using a vortexer. We recorded their movement right after the vortexer and uploaded the video into the software ImageJ, where we analyzed the flies' movement. We found that there is no significant difference in the severity of the flies' seizures (T-test p-value = 0.11) and duration (T-test p-value = 0.1); however, we have reason to believe that with more test subjects, we could see a significant difference in both severity and duration of the seizures. Our data also showed that the flies that consumed Keppra had less twitching after their seizures, meaning that they recovered from them faster (T-test p-value = 0.01). In conclusion, we found that Keppra did not significantly affect the severity or duration of the seizures, but it did affect how fast the flies got over the seizures and returned to normal locomotor behavior.

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