BRV **decreased** seizure incidence, seizure frequency, time spent seizing, and the proportion of spreading seizures in rats.

**INTRODUCTION**

- Synaptic vesicle protein 2A (SV2A) may be a therapeutic target to prevent human posttraumatic epilepsy (PTE)\(^1\). Brivaracetam (BRV) has higher affinity and specificity for SV2A, than levetiracetam.\(^2\)
- We assessed the antiepileptogenic potential of BRV in rats using an etiologically realistic PTE model that likely incorporates mechanisms operating in human posttraumatic epileptogenesis.

**METHODS**

1. We assessed the incidence, frequency, duration, and spread of seizures in the optimized fluid percussion injury (FPI) model in 5-week-old male Sprague-Dawley rats (Charles River, Hollister, CA, USA) after BRV administration.
2. To eliminate futile treatment protocols, different doses and latencies to treatment were first rapidly screened (62 animals) with small group sizes, in short 1-month-long protocols.
3. A 16-week-long validation study tested 4 weeks of BRV treatment initiated 30 min (n=18), 4 h (n=18), or 8 h (n=22) after FPI, compared with vehicle-treated FPIs (n=20).
4. Perilesional seizures and their spread were sensitively detected by video-electroencephalography (EEG). Screening and validation studies were blind and randomized.

**RESULTS**

- 16 weeks after injury, treatment starting 4 h post-FPI (the best-performing protocol) induced decreases in seizure incidence (38%; \(p<0.05\)), seizure frequency (59%; \(p<0.01\)), time spent seizing (67%; \(p<0.005\)), and proportion of spreading seizures (45%; \(p=0.02\)), that were all independent from duration-based seizure definitions.

**CONCLUSIONS**

- BRV persistently reduced the incidence and frequency of seizures, the time spent seizing, and further modified PTE by decreasing the spread of focal seizures from the neocortical focus.

![BRV Chart](chart.png)