

The effects of early life seizures on auditory communication in rats

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Early life seizures (ELS) affect approximately 3/1000 infants and are associated with detrimental neurological outcomes, including deficits in socialization. Social behaviors, communicative deficits, and ELS have not been thoroughly studied and mechanistically linked. Our goal is to determine the nature of auditory communicative differences triggered by ELS. We hypothesize that deficits in socially relevant auditory communication underlie the social deficits seen following ELS. This study assesses the differences in vocalizations of Sprague-Dawley rats between treatment groups (ELS/control) and naive groups and also between male and female gonadal sex. These differences are explored to determine the impact of ELS on receptive and/or expressive auditory communication. Ultrasonic vocalizations (UVs) obtained during social testing underwent complex call analysis in order to determine if call characterization between ELS and control rats are different during a novel social encounter. During complex UV analysis, the experimenters identify call type, duration (ms), and frequency (kHz) while blind to treatment condition. Results are pending statistical analysis, and we anticipate that there will be differences between the treatment groups. Understanding the long term impact of ELS on auditory communication is clinically relevant, yet remains underexplored in the literature. Insights derived from our model may impact our understanding of neurodevelopmental disorders. This model displays broad translational ability in modeling diverse chronic deficits that occur following ELS, as it demonstrates altered synaptic plasticity and mimics behavioral and neurochemical changes associated with neurodevelopmental changes ensuing ELS.

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