AN EXAMINATION OF COGNITIVE DEFICITS FOLLOWING EXPERIMENTAL FEBRILE STATUS EPILEPTICUS IN RAT PUPS: NEUROBIOLOGY AND BIOMARKERS

Permalink
https://escholarship.org/uc/item/5753h12c

Journal
EPILEPSIA, 54

ISSN
0013-9580

Authors
Barry, JM
Robbins, AA
Scott, RC
et al.

Publication Date
2013-06-01

License
CC BY 4.0

Peer reviewed
Abstracts

P475
AN EXAMINATION OF COGNITIVE DEFICITS FOLLOWING EXPERIMENTAL FEBRILE STATUS EPILEPTICUS IN RAT PUPS: NEUROBIOLOGY AND BIOMARKERS
Barry JM¹, Robbins AA¹, Scott RC¹,², Lenck Santini PP¹, Choy M³, Dube C³, Baram TZ³,⁴,⁵, Holmes GL¹
¹Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA, ²UCL Institute of Child Health, London, UK, ³Department of Neurology, University of California Irvine, Irvine, CA, USA, ⁴Department of Pediatrics, University of California Irvine, Irvine, CA, USA, ⁵Department of Anatomy and Neurobiology, University of California Irvine, Irvine, CA, USA

Purpose: To test the hypothesis that cognitive deficits can be measured in a subset of rats that have experienced prolonged EFS. Deficits in performance in a spatial task are examined in relation to cellular function as well EEG in the hippocampus in search of biomarkers for cognitive performance. The results of the study may create biomarkers for those at risk for cognitive deficits following febrile seizures and set the stage for intervention.

Method: EFSE is induced in rat pups at P10 through prolonged hyperthermia while controls are kept at room temperature. At 8 weeks old the rats are trained to perform a spatial task involving avoidance of a shock zone on a rotating arena. After 12 weeks the rats undergo chronic implantation of four separately drivable tetrodes in left and right hippocampus. Cellular activity as well as local field potentials are recorded simultaneously from each hippocampus while the rat forages for food pellets on a stable arena or avoids a shock zone on a rotating arena.

Results: Preliminary data examine the stability of firing fields for both EFSE and control rats on the stable arena as well as potential differences in firing activity in the transition between the stable and rotating arena conditions. Oscillatory phenomena, such as the power and frequency of sharp wave ripple complexes as well as theta gamma comodulation are