LETHBRIDGE Herald

Son’s seizures helps researcher

BY KUHL, NICK ON SEPTEMBER 14, 2017.

Lethbridge Herald

Artur Luczak’s infant son suffered a seizure, and what he’s learned about seizures since has changed the understanding of how the brain functions during these traumatic events.

When Luczak, a researcher in the University of Lethbridge’s Canadian Centre for Behavioural Neuroscience (CCBN), witnessed his infant son experience an epileptic seizure, it made an impression both personally and professionally.

Already deep in research that examines the interaction between neurons in the brain, Luczak turned to look at ictal (seizure) events by applying data techniques to gain a better understanding of how seizures develop in the brain.

“Having my son in my hands when he lost consciousness was the worst experience in my life,” said Luczak in a U of L press release. “It really put me on this path to not only do the basic research but also this transitional research, which means in the future we can have a better understanding of the brain and hopefully design some better help for people with epilepsy.”

The prognosis for his son is positive as he fell into that group of infants who sometimes experience febrile seizure events when they develop high fevers. For the many people who are diagnosed as epileptics, however, understanding what is happening in their brains is extremely complicated.

Luczak said the prevailing theory behind ictal events is that the balance between excitatory neurons and inhibitory neurons in the brain is out of line, favouring excitation and a massive excitatory event.

Using a technique to look at up to 100 neurons simultaneously, including the ability to differentiate between excitatory and inhibitory neurons, Luczak and his research team found the inhibitory neurons, rather than being dormant throughout an ictal event, were significantly contributing to the seizure.

“This means that it’s not just excitation without check of inhibition but rather there is some complex network problem in which also inhibitory neurons are playing an important role,” says Luczak, whose findings from a collaborative study with the U of L’s Dr. Bruce McNaughton and researchers from Stanford University and Ghent University (Belgium) were published recently in the top neurology journal Brain.

“It means that the picture is unfortunately much more complex than we thought. The first obvious thing is trying to repress these inhibitory cells during an ictal event. What will happen if we switch off those neurons, will it make it worse or will it reduce the seizure? This is the next question we will be pursuing to somehow better understand what is happening.”

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