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EFFECTS OF IL-1β SIGNALING ON SYNAPTIC PROTEINS AND STRUCTURAL INTEGRATION OF NEWBORN NEURONS IN THE ADULT MOUSE BRAIN

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Purpose: Neurogenesis is a constantly ongoing process in the adult brain and takes place in the hippocampus and lateral ventricles. The newly born neurons connect with the surrounding network of neurons and form integrated functional neurons. There are a number of different pathways and processes that regulate neurogenesis and synaptogenesis, including epileptic seizures, and a plethora of proteins and components vital for the establishment of functional synapses. Interleukin -1 (IL-1) is thought to be one of the key factors in these processes, affecting spine size, synaptic transmission and signal strength. In the present study, our objective is to investigate how IL-1 signaling affects the expression of synaptic proteins, such as neuroligin -2 (NL-2), neurologin-1 (NL-1), N- cadherin, PSD-95 and gephyrin on newly born neurons in the hippocampus and what consequences this may bring in terms of synaptogenesis and structural integration into the surrounding environment.

Method: We utilized a mouse model lacking the interleukin-1 receptor gene, IL-1R1 knockout (KO) mice, and a wildtype (WT) group. Newborn neurons were visualized with retroviral vector expressing green fluorescent protein. Synaptic protein expression was evaluated with immunohistochemistry and high-resolution confocal microscopy.

Results: Gross morphology of 6 weeks old neurons and spine density on their apical dendritic tree did not differ between IL-1R1 KO and WT groups. However, a trend towards an increase in immature spines with a filopodia morphology was evident. Total number and size of NL-2 clusters on the new neurons did not differ between groups.

Conclusion: The results implicate that IL-1 signaling could be important for the development of excitatory synapses on spines, while it may not be crucial for NL-2 depending adhesion in inhibitory synapses.

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EFFECTS OF KINDLING STIMULATIONS ON PARVALBUMIN IMMUNOREACTIVITY IN SUBSTANTIA NIGRA PARS RETICULATA OF GAERS AND WISTAR RATS

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Purpose: One of the mechanisms that control epileptic seizures involves the neural network in the substantia nigra pars reticulata (SNR). Two functionally discrete regions, SNRanterior and posterior were demonstrated to mediate distinct effects on epileptic seizures. Genetic Absence Epilepsy Rats from Strasbourg (GAERS) show a resistance to secondary generalization of focal limbic seizures induced by kindling. We found that lidocaine injections into the SNRposterior obliterate the resistance to kindling, suggesting that the SNRposterior is an important site underlying this resistance. In this study, the immunoreactivity of parvalbumin (PV) positive GABAergic neurons in the SNRposterior and SNRanterior was compared between GAERS and Wistar animals following kindling stimulations.

Method: Electrically stimulated or sham-operated adult male GAERS and Wistar rats were used in the experiment. Following the sixth electrical stimulation of basolateral amygdala, rats were transcardially perfused with neutral buffered formalin solution and brains were removed. The sagittal sections were treated with mouse anti-PV antibody and were analyzed with a computer based programme.

Results: There was no difference in the basal PV immunoreactivity of the SNRposterior or SNRanterior between sham operated GAERS and Wistar animals. Slightly increased PV immunoreactivity in SNRposterior was detected both in stimulated GAERS and Wistar rats than those in sham operated groups.

Conclusion: Densitometric analysis of PV positive GABAergic neurons in both SNRanterior and posterior did not reveal significant differences between sham operated GAERS and Wistar rats. Increased PV immunoreactivity in the SNR posterior of stimulated groups indicates importance of the SNR posterior in modulating epileptic seizures.

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USING THE STIGMA SCALE OF EPILEPSY (SSE) TO ASSESS EFFECTIVENESS OF AN EPILEPSY IN-SERVICE PROGRAMME FOR EDUCATORS

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Purpose: Addressing stigma towards epilepsy in educational settings is a key step in ensuring an improvement of the quality of life of young persons with epilepsy. The aim of this study was to assess the effectiveness of training courses in reducing the perceived stigma by a group of educators, by using the stigma scale of epilepsy (SSE).

Method: Educators who attended an in-service 3 day course on epilepsy were asked to fill in the SSE, at the beginning of the course and at the end. The SSE scale used contained questions about the individual perception of epilepsy. Participants were asked to check the most appropriate class of answers for each item.

Results: A total of 60 educators attended the course. Their mean age was 34.7 ± 12 years and their teaching experience ranged from one to eighteen years (mean ± SD 8.4 ± 9.4 years). Forty six had no experience with children with epilepsy, while twelve have had children with epilepsy in the classroom. All the participants completed the questionnaires on both occasions. The overall mean scores of the SSE at the beginning of the course were 31.86 (SD = 12.51; max = 50.00; min = 11.11) while following the course, it was reduced to 27.86 (SD = 10.99; max = 44.00; min = 9.72), ($p < 0.05$). At the beginning of the course, the items which were perceived as beginning the most common difficulties people with epilepsy have in their daily lives are emotions and prejudice, while at the end of the course, these were school and work.

Conclusion: The SSE can be a useful instrument in validating and improving such training courses. This type of analysis could provide a useful tool for tailoring the education of educators working in this field of epilepsy. It will also help to focus appropriate population-based studies and educational campaigns on epilepsy in schools and universities.

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EPILEPSY AND ANTIEPILEPTIC DRUGS TREATMENT IN ELDERLY

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