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Molecular mechanism and intervention studies of regenerative mossy fiber sprouting in hippocampus following developmental seizures

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Developmental seizure-induced brain damage can cause serious neurological sequelae. Denervation and regenerative mossy fiber (MF) sprouting in the hippocampal dentate gyrus and CA3 subfields are the main neuroanatomical bases. We used several developmental epilepsy animal models to study the mechanism of seizure-induced mossy fiber sprouting and intervention strategy. We found that recurrent prolonged developmental seizures induced by penicillin or inhalant flurothyl can cause long-term cognitive deficit and hippocampal regenerative sprouting in adulthood, which is in parallel with long-term significantly up- or down-regulated expression of zinc transporters (ZnT1, ZnT3, ZIP6), plasma membrane damage associated-lipid metabolism molecules (PRGs, Cyp46a1, cPLA2, ACAT1, nSMase, Kcnj11, Lepr, Drd2, Mc4r, Apoa1, Oprk1, Pdk4, ApoE) and autophagy markers (beclin-1, LC3, p62, cathepsin E) in the hippocampus. Moreover, there were significant correlation among autophagic, Zn transporter signaling and lipid metabolism molecules. Ketogenic diet, plasma membrane oxidant injury protectant melatonin, lipid metabolism regulating molecule leptin, autophagy inhibitors (3-MA, CBI, E-64d), as well as early physical exercise were able to restore the abnormal expressions to normalize and alleviate the aberrant hippocampal MF sprouting, neurobehavioral and cognitive changes, which may be achieved through cPLA2/drp1/autophygy pathway, and by regulating the expression of Zinc/CaMK II signaling. Our study will be helpful for exploring the target genes of axonal regeneration following developing seizures from a new point of view and will contribute the efforts for making proper early intervention, as well.

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Factors related to nursing-reported adverse events in intensive care units: Multicenter project

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Introduction: Adverse Events (AD) are unintentional health care damage that relates to human resources, system factors, or clinical conditions.

Objective: The objective of the study is to analyze the factors related to the quality and safety of the patient through the reports of AD.

Methodology: A cross-sectional, multicenter design, was carried out at five National Institutes of Health and a high-specialty hospital. We studied the AEs that occurred during 18 months using SYREC instrument 2007. The statistical analysis was done with SPSS 20 and the ethical aspects were observed.

Results: A total of 540 AD were analyzed, 55.5% were men, 58.7% were on alert, 92.6% were in the assigned service, 55.9% were not reported to the family, considered as definitely avoidable 70.5%. The system factors were present in 80.6%, there was a significant association regarding the avoidability of the event and the factors of the system.

Discussion: The main results are in agreement with other international investigations in which the children and the elderly are more vulnerable such as: "To errors human" 1999, ENEAS study of Spain 2006 and with the prevalence IBEAS 2010; In all of them it became evident the need to reinforce the culture of the notification of the AD and the climate of patient safety, fostered an interpersonal reflection about the quality of health care services.

Conclusions: Factors related to the system have a greater weight in the occurrence of AD. Their identification is of vital importance in order to avoid them.

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