Research Abstract

Clinical and research interest in traumatic brain injury (TBI) has expanded markedly with the increased recognition of the consequences of blast-related and sports-related insults. Recent clinical and pre-clinical observations have served to revise conceptions about the sequelae, mechanisms and potential treatment of TBI. This lecture addresses such issues as epidemiology of post-concussion effects, role of gender and age for outcome after injury, chronic inflammation and progressive neurodegeneration, and new treatment approaches.

Fig. 2. Combined inhibition reduces the lesion size and hippocampal neuron loss after TBI. A. Representative T2-weighted MRI images from CCI-injured vehicle- and BAF-treated CypA\(^+\)/+ and CypA\(^-\)/- mice at 21 days post-injury. B. T2-weighted MRI lesion volume quantification. Lesion volume was significantly reduced in the injured BAF-treated CypA\(^-\)/- group (p < 0.05 versus CypA\(^+\)/+ + Veh; n = 10–13/group, Mean ± SEM, One-way ANOVA, Tukey's post-hoc test). C. Linear regression analysis comparing TBI-induced lesion size with foot-faults in he beam walk test at 21 days post-injury ($r^2 = 0.8328$, n = 6–7, $p < 0.01$, one-tailed Pearson's correlation). D. Unbiased stereological assessment of surviving neurons in the CA2/3 region of the hippocampus. BAF-treated CypA\(^-\)/- mice had significantly improved CA2/3 neuronal survival after TBI (p < 0.05 versus CypA\(^+\)/+ + Veh; n = 5–7/group, Mean ± SEM, One-way ANOVA, Tukey's post-hoc test). E. Linear regression analysis comparing TBI-induced neuronal loss in the CA2/3 with latency to reach the submerged platform on day 17 of MWM ($r^2 = 0.8857$, n = 4–5, p < 0.01, one-tailed Pearson's correlation).

References