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2015. Cook, P., Reichmuth, C., Rouse, A., Libby, L., Dennison, S., Stuppino, J., Kruse-Elliott, K., Bloom, J., Carmichael, O., Singh, B., Fravel, V., Barbarosa, L., Van Bonn, B., Gulland, F., and Ranganath, C. The neurobehavioral effects of naturally occurring domoic acid toxicosis in wild California sea lions. *21st Biennial Conference on Marine Mammals*, San Francisco, United States, 13 December – 18 December. (Presentation abstract).

The neurobehavioral effects of naturally occurring domoic acid toxicosis in wild California sea lions

Domoic acid, an algal neurotoxin, has wide-ranging effects on marine mammals. Here we detail behavioral and neurological impact in wild California sea lions undergoing rehabilitation. Text: The algal neurotoxin domoic acid (DA) causes frequent stranding and mortality in California sea lions (CSLs). Affected animals have seizures and develop hippocampal lesions, but no clear data link the specific neurological effects in wild animals to behavioral impairment. Thirty wild CSLs undergoing rehabilitation took part in two assays of spatial learning and memory--delayed alternation in a two-choice maze and a once-daily foraging task. Each animal also received a structural MRI scan. Measures of hippocampal volume were compared to memory performance. To look for distributed changes in brain function from DA toxicosis, another 11 wild CSLs (5 with hippocampal lesions, 6 without) took part in a study examining functional brain connectivity using fMRI. In the 6 controls, the anterior thalamus was strongly connected to the hippocampus--a pathway supporting spatial memory in primates and rodents. Hippocampal-thalamic connectivity was then compared between the damaged and control animals. Extent of damage to right dorsal hippocampus, but not other regions, predicted memory errors, and fMRI showed decreased hippocampal-thalamic connectivity in the DA animals. The finding of functional specialization of the right dorsal hippocampus in CSLs for spatial memory parallels recent findings with humans and rodents, and has bearing on veterinary decisions. Reduced hippocampal-thalamic connectivity may also contribute to memory deficits in CSLs with DA toxicosis.