EFFECTS OF EXPOSURE TO STRESS LEVELS OF GLUCOCORTICOIDS ON THE RETENTION OF A SPATIAL TASK IN RATS INJECTED BILATERALLY WITH BETA-AMYLOID INTO THE HIPPOCAMPUS.

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The pathology of Alzheimer's disease is characterized by neuritic plaques and neurofibrillary tangles. The core component of the plaques is an amino acid named Beta-amyloid. A recent study done by Dornan, Kang, McCampbell, and Kang (1993) reported that bilateral injections of Beta-amyloid and ibotenic acid into the hippocampus significantly impaired the acquisition of a spatial learning task in rats. Dornan et al suggest that the results seen in their study maybe due to Beta-amyloid + ibotenic acid working synergistically via NMDA receptors to cause calcium dyshomeostasis. Another way that calcium dyshomeostasis occurs in the brain is via glucocorticoids. In a study done by Sapolsky (1985), exposure to stress levels of glucocorticoids exacerbated Kainic acid damage to hippocampal neurons, suggesting the possibility that glucocorticoids may endanger neurons by making them more vulnerable to outside toxic insults. Therefore in this study we assessed the effects of glucocorticoids on the retention of a spatial task in animals. The animals were pretrained on an 8 arm radial maze for a period of two weeks. The maze contained 5 baited arms and 3 unbaited arms. One week prior to and one week following bilateral intracerebral injections of Beta-amyloid (1-42) into the dorsal hippocampus animals were either adrenalectomized or injected daily with corticosterone (glucocorticoid) or sesame oil (vehicle). Following treatment animals were tested on the radial arm maze for 14 days and measured for correct choice (number of baited arms entered), reference memory error (number of unbaited arms entered), correct error (reentry into a baited arm) and incorrect error (reentry into an unbaited arm). Statistical analysis will be preformed on the data using oneway ANOVA with the number of days as the repeated measure and the treatment conditions as the between group measure. The results of this study will be presented at the conference.