P-801 - IN VIVO NEUROIMAGING EVIDENCE OF OXIDATIVE STRESS IN MAJOR DEPRESSIVE DISORDER

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Introduction: Mounting evidence has implicated oxidative stress in severe psychiatric disorders, including major depressive disorder (MDD). Glutathione (GSH) is the major intracellular antioxidant that protects cells against oxidative stress.
Objective: To test the hypothesis that oxidative stress is implicated MDD by measuring cortical GSH in MDD patients and in matched healthy controls *in vivo*, using magnetic resonance spectroscopy (MRS).
Methods: Fifteen psychotropic medication-free patients with MDD diagnosed according DSM-IV-TR criteria and 13 healthy volunteers (HV) participated in the study. A history of other axis I diagnoses or substance/alcohol abuse was exclusionary for all subjects. *In vivo* brain GSH levels, expressed in institutional units, were obtained from a single 3x3x2-cm^3 occipital lobe voxel at 3.0 Tesla using MRS spectral editing.
Results: Statistical comparisons revealed a 20.6% mean cortical GSH decrease ($p < .003$) in MDD (2.3 ± 0.4) compared to HV (2.9 ± 0.6), which remained significant after adjusting for age, sex, bmi, and smoking status. In addition, we found GSH levels to correlate negatively with depressive symptoms and with indices of emotional and functional disability across all participants.
Conclusions: To our knowledge, this is the first study to report a significant cortical GSH deficit *in vivo* in MDD, a finding that supports a role for oxidative stress in the pathophysiology of the disorder, and suggests the viability of treatment strategies based on using synthetic GSH precursors, such as N-acetylcysteine, to spur *in situ* synthesis and elevation of the antioxidant and mitigate the pathogenic effects of oxidative stress.

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