Elevated levels of oxidative stress in bipolar disorder

Altered plasma glutathione levels in bipolar disorder indicates higher oxidative stress; a possible risk factor for illness onset despite normal brain-derived neurotrophic factor (BDNF) levels

Background Oxidative stress and neurotrophic factors have been implicated in the pathophysiology of bipolar disorder. Our objective was to determine whether plasma glutathione or brain-derived neurotrophic factor (BDNF) levels were abnormal in bipolar disorder and therefore useful as possible biomarkers.

Results Compared with controls, bipolar patients had significantly lower levels of total glutathione and it was more oxidized. BDNF levels were not different. Age of illness onset but not current mood state correlated with total glutathione levels and its oxidation status, so that lower levels of total and reduced glutathione were associated with later onset of disease, not length of illness.

Conclusions Plasma glutathione levels and redox state detect oxidative stress even in subsyndromal patients with normal BDNF. It may relate to the onset and development of bipolar disorder. Plasma glutathione appears to be a suitable biomarker for detecting underlying oxidative stress and for evaluating the efficacy of antioxidant intervention studies.

N-acetylcysteine will replenish glutathione levels, and has already shown efficacy in treating bipolar disorder. See The efficacy of N-acetylcysteine as an adjunctive treatment in bipolar depression: an open label trial, which concludes, “These open label data demonstrate a robust decrement in depression scores with NAC treatment. Large placebo controlled trials of acute bipolar depression are warranted.” NAC has also been found useful in schizophrenia, addiction, and compulsive and grooming disorders: N-acetylcysteine in psychiatry: current therapeutic evidence and potential mechanisms of action.

In general, it seems that oxidative stress is a central component of many mental health disorders, and NAC may have the ability to substantially ameliorate some of them. But, NAC is cheap and off-patent, so no one makes money off it. So doctors and Big Pharma won’t be promoting it.