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BIPOLAR DISORDERS Factsheet

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What is oxidative stress?

While oxygen is a vital component of life, some oxygen-based compounds called free radicals can be toxic due to their highly unstable nature. The key free radical classes are the reactive oxygen species and reactive nitrogen species, and they are formed as by-products of normal metabolism. Under normal conditions, these free radicals are tightly monitored and controlled by stringent protective barriers, such as their rapid removal from cells and antioxidant enzymes that break them down.

At tightly maintained concentrations, free radicals play an important role in cellular signalling, immune responses and cell growth. However, excess free radicals can result from interruption of the antioxidant defense barrier, or from excess production. This can cause oxidative stress, resulting in structural damage to cellular proteins, fats, carbohydrates and nucleic acids (DNA and RNA). Severe oxidative stress can result in failure of cell growth, apoptosis and cell necrosis.

What is the evidence for oxidative stress in people with bipolar disorder?

Moderate to high quality evidence finds large increases in lipid peroxidation, nitric oxide, and DNA/RNA damage in people with bipolar disorder compared to controls. There were no differences in protein carbonyl or 3-nitrotyrosine.

Moderate quality evidence finds large increases in malondialdehyde, thiobarbituric acid reactive substances, total nitrites, catalase, and glutathione transferase in people with bipolar disorder compared to controls. There were medium-sized increases in glutathione, apart from in the anterior cingulate where glutathione was reduced in bipolar II disorder patients. There were medium-sized increases in uric acid, particularly during mania. Superoxide dismutase was increased, and glutathione peroxidase was decreased only in patients who were medication-free and in a manic phase. There were no differences in levels of zinc.

For more information see the technical table

NeuRA
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NeuRA (Neuroscience Research Australia) is one of the largest independent medical and clinical research institutes in Australia and an international leader in neurological research.

Diseases of the brain and nervous system pose the greatest health, economic and social burden of any disease group because they are chronic, debilitating and have no known cures.

Medical research is the cornerstone of efforts to advance the health and wellbeing of families and the community. Our dedicated scientists are focussed on transforming their research into significant and practical benefits for all patients.

While we hope you find this information useful, it is always important to discuss any questions about bipolar disorder or its treatment with your doctor or other health care provider.

HOW YOUR SUPPORT HELPS

We are able to make significant advances due to the generosity of countless people. Your donation allows us to continue to work towards transforming lives. For information on how you can support our research, phone **1300 888 019** or make a secure donation at **neura.edu.au**.

NeuRA (Neuroscience Research Australia) Foundation
T 1300 888 019 **F** +61 2 9399 1082
ABN 57 008 429 961

Margarete Ainsworth Building
Barker Street, Randwick NSW 2031
PO Box 1165 Randwick Sydney NSW 2031 Australia

neura.edu.au