Omega-6 fatty acids could cut risk of bipolar disorder, study suggests

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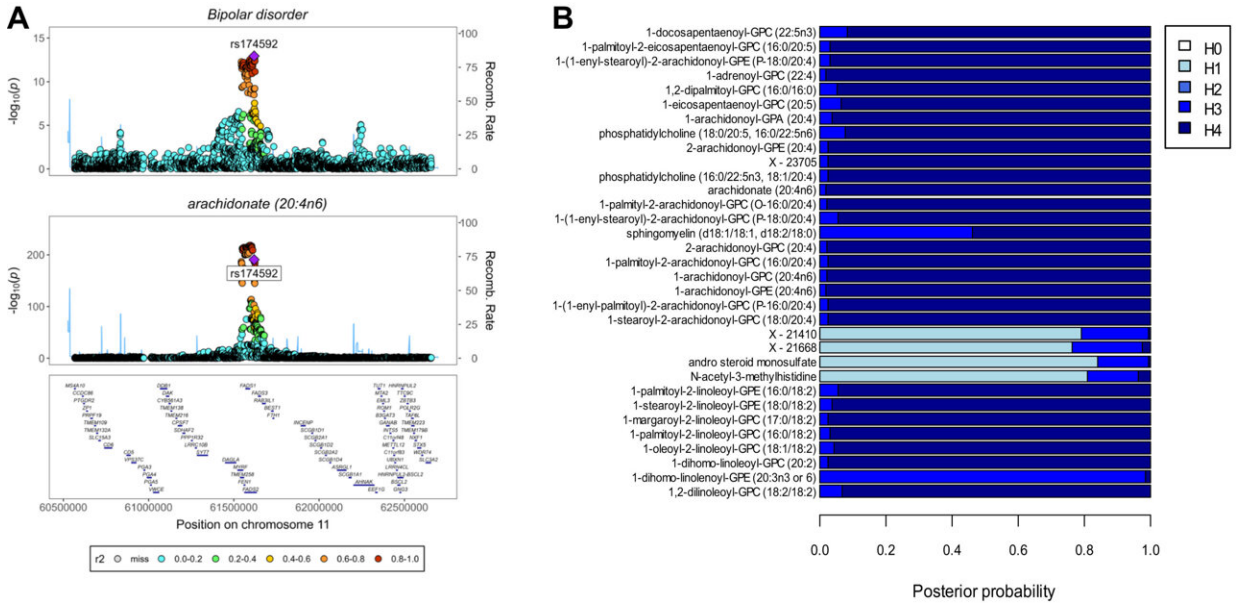

The genome-wide significant bipolar disorder (BPD) signal at the FADS1/2/3 cluster shares the same genetic etiology with 27 of the 33 metabolites tested, including arachidonic acid. (A) Regional association plot centered on the FADS1/2/3 locus depicting the BPD (top) and arachidonic acid (bottom) signals. The BPD sentinel variant, rs174592, is indicated. (B) Stacked bar plot depicting posterior probabilities of H0 (no causal variant), H1 (causal variant for BPD only), H2 (causal variant for metabolite only), H3 (2 distinct causal variants), and H4 (1 shared causal variant) returned by Coloc. Credit: *Biological Psychiatry* (2024). DOI: 10.1016/j.biopsych.2024.02.1005

Omega-6 fatty acids, commonly found in eggs, poultry, and seafood, could reduce the risk of bipolar disorder, according to a study from the University of South Australia published in the journal *Biological Psychiatry*.

Using Mendelian randomization, a powerful causal inference method, researchers tested 913 metabolites across 14,296 Europeans, finding 33 (mostly lipids) were associated with risk of bipolar disorder.

Bipolar disorder is a debilitating mood disorder characterized by recurring episodes of mania and depression. Although its cause is still unclear, previous studies have shown that bipolar disease is highly heritable. If a parent has bipolar, a child has a 1 in 10 chance of also developing the condition.

Globally 1 in every 8 people live with mental conditions, with about 40 million experiencing bipolar disorder. Nearly 3% of Australians (568,000 over the age of 16) live with bipolar disorder.

Chief investigator Dr. David Stacey says that the new evidence paves the way for novel potential lifestyle or dietary interventions.

"There's growing evidence to suggest that metabolites play a key role in bipolar and other psychiatric disorders," Dr. Stacey says.

"This is extremely encouraging because if we can find factors that connect certain health conditions, we can identify ways to negate these through potential lifestyle or dietary interventions.

"In this study, we found that a genetic propensity for higher levels of lipids containing arachidonic acid, led to a lower risk of bipolar disorder. And conversely, that lower levels of arachidonic acid had a higher risk for bipolar disorder.

"Arachidonic acid can be sourced directly from meat and seafood products or synthesized from dietary linoleic acid (such as nuts, seeds, and oils). But it is also present in human milk, so is considered essential for infant brain development.

"In fact, in many countries, arachidonic acid is added to infant formula to ensure a child gets the best start to life. So, there is certainly potential to boost this through supplements for people at greater risk of bipolar disorder.

"The challenge is, however, that while we know that arachidonic acid is involved in early brain development, it's unclear whether supplementation for bipolar disorder should occur perinatally, during early life, or even whether it would benefit those already diagnosed."

Professor Elina Hyppönen, who co-authored the study, says preclinical studies and randomized controlled trials are required to determine the preventative or therapeutic value of arachidonic acid supplements to combat bipolar disorder.

"We need further studies to rigorously assess the potential for arachidonic acid supplementation in bipolar disorder prevention and treatment, particularly in people who carry genetic risks," Prof. Hyppönen says.

"While our findings support potential avenues for precision health interventions for early life nutrition for babies' brain development, we need to know more about the connection with bipolar disorder.

"If we can establish how, why and when people respond to arachidonic acid supplementation, then we will be one step closer to helping people who are struggling with this serious and lifelong mental health condition."

More information: David Stacey et al, A Metabolome-Wide Mendelian Randomization Study Identifies Dysregulated Arachidonic Acid Synthesis as a Potential Causal Risk Factor for Bipolar Disorder, *Biological Psychiatry* (2024). DOI: 10.1016/j.biopsych.2024.02.1005

Provided by University of South Australia

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