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SCHIZOPHRENIA Factsheet

October 2020

What are lipids and fatty acids?

Lipids are fundamental membrane constituents that make up as much as 50-60% of the human brain's weight. The main lipid compounds present in the brain are essential fatty acids (EFAs), which bind largely to glycerophospholipids (GPLs). There are several types of GPLs, which each have distinct EFA composition. In the adult human brain these include phosphomonoesters (PME), such as phosphatidylethanolamine (PtdEtn), phosphatidylcholine (PtdCh, also lecithin), as well as phosphatidylserine (PtdSer) and phosphatidylinositol (PI). Phosphodiester (PDE) compounds include glycerophosphatidylcholine (GPCh) and mobile phospholipids (MP). Phosphomonoesters are precursors in phospholipid membrane synthesis, while phosphodiesters are phospholipid membrane breakdown products. The two primary essential fatty acid series are n-3 (omega-3) and n-6 (omega-6). Linoleic acid (LA, 18:2n-6) and alphalinolenic acid (α-LA, 18:3n-3) are the parent compounds of these two EFA series. Metabolites of LA and α-LA are referred to as 'derived EFAs', and include arachidonic acid (AA, 20:5n-6), docosahexaenoic acid (DHA, 22:6n-3) or eicosapentaenoic acid (EPA, 20:5n-3) and their products (eicosanoids) such as prostaglandins, thromboxanes, prostacyclins and leukotrienes.

What is the evidence for lipids and fatty acids?

Moderate quality evidence suggests there are reduced levels of EFAs and GPLs in cellular membranes of people with schizophrenia, with most consistent results being for linoleic acid, AA and DHA. Fatty acids are also reduced in the red blood cell membranes, particularly in patients treated with first generation antipsychotics. There are decreased frontal PME levels in first-episode psychosis and chronic schizophrenia patients and increased frontal PDE levels in first-episode psychosis patients only. There is decreased temporal PME and increased temporal PDE levels in first-episode psychosis patients. Chronic patients also showed increased temporal PDE levels. Moderate to low quality evidence suggests PLA_2 levels are increased in the frontal and temporal cortices and the putamen of people with schizophrenia. Moderate to low quality evidence also suggests administration of omega-3 may be associated with significant improvements in symptoms, with no significant benefit from omega-6 or PGE1.

For more information see the technical table

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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 schizophrenia 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/donate/schizophrenia**.

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