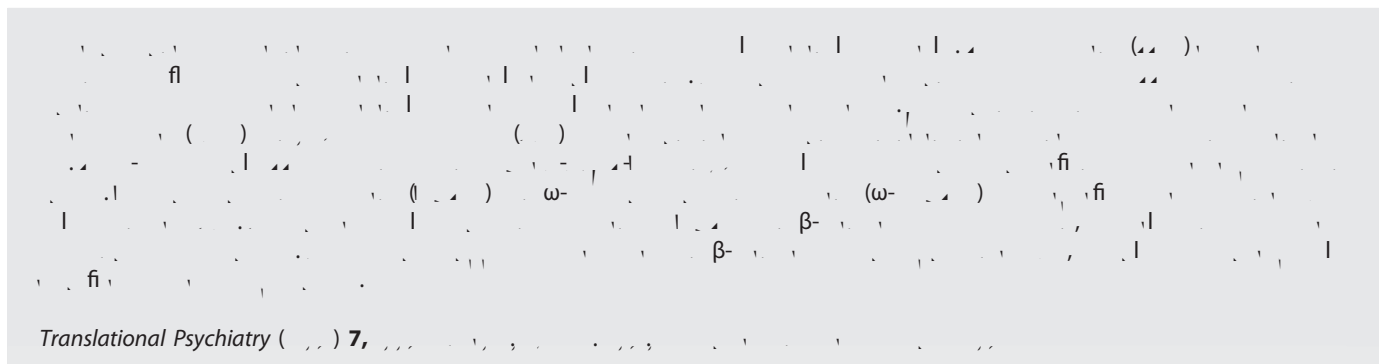


ORIGINAL ARTICLE

Serum fatty acid patterns in patients with schizophrenia: a targeted metabolomics study

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Translational Psychiatry (2017) 7, 1–11 | www.nature.com/tp

INTRODUCTION

There is growing interest in the role of fatty acids in schizophrenia. Fatty acid metabolism is a complex process involving many enzymes and cofactors. Defects in these pathways can lead to abnormal fatty acid profiles in the blood. In this study, we used a targeted metabolomics approach to analyze serum fatty acid patterns in patients with schizophrenia. We found that patients with schizophrenia had significantly lower levels of several long-chain polyunsaturated fatty acids (LCPUFAs), including docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). These findings are consistent with previous research suggesting that low levels of LCPUFAs are associated with schizophrenia. The exact mechanism underlying this association remains unclear, but it may involve altered fatty acid metabolism or increased oxidative stress.

The pathogenesis of schizophrenia is complex and involves genetic, environmental, and neurobiological factors. Fatty acids are essential for brain development and function. They are involved in cell membrane structure, signaling, and energy production. Defects in fatty acid metabolism can lead to neurodevelopmental abnormalities and may contribute to the risk of schizophrenia. This study provides further evidence for the role of fatty acids in schizophrenia and highlights the need for further research into the underlying mechanisms.

Our study used a targeted metabolomics approach to analyze serum fatty acid patterns in patients with schizophrenia. We found that patients with schizophrenia had significantly lower levels of several long-chain polyunsaturated fatty acids (LCPUFAs), including docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). These findings are consistent with previous research suggesting that low levels of LCPUFAs are associated with schizophrenia. The exact mechanism underlying this association remains unclear, but it may involve altered fatty acid metabolism or increased oxidative stress.

MATERIALS AND METHODS

The study included 100 patients with schizophrenia and 100 healthy controls. Serum samples were collected and analyzed using a targeted metabolomics approach. The fatty acid profiles were compared between the two groups. We found that patients with schizophrenia had significantly lower levels of several long-chain polyunsaturated fatty acids (LCPUFAs), including docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). These findings are consistent with previous research suggesting that low levels of LCPUFAs are associated with schizophrenia.

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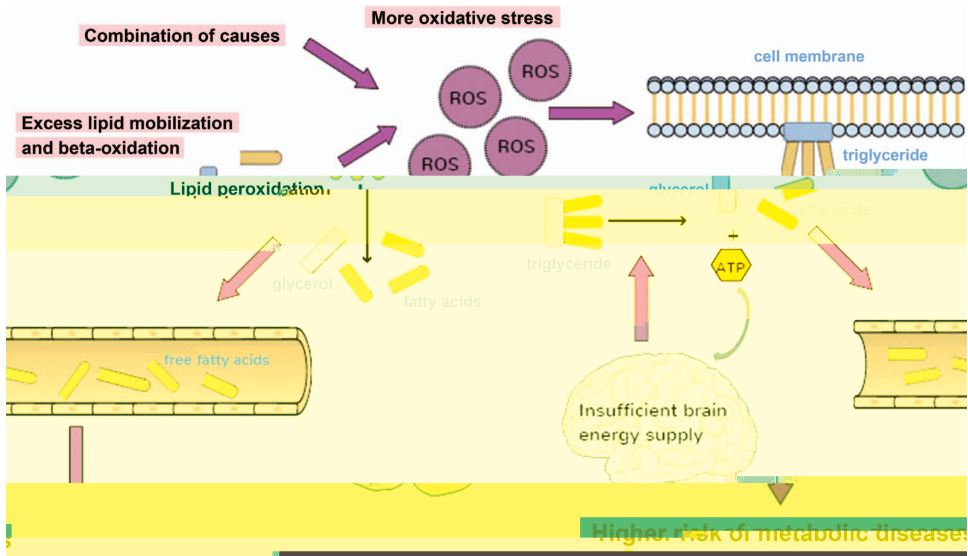


Figure 3. The combination of causes, including excess lipid mobilization and beta-oxidation, leads to more oxidative stress (ROS). ROS causes lipid peroxidation, which releases free fatty acids (FFA) and glycerol. Excess lipid mobilization and beta-oxidation also contribute to ROS. This leads to insufficient brain energy supply (ATP) and a higher risk of metabolic disease.

Higher levels of oxidative stress.

The diagram illustrates a cycle of oxidative stress and lipid metabolism. At the top, 'More oxidative stress' is shown with several purple circles labeled 'ROS'. An arrow points from 'ROS' to a 'cell membrane' represented by a phospholipid bilayer. Another arrow points from 'ROS' to 'Lipid peroxidation', which is shown as a yellow layer. From 'Lipid peroxidation', arrows point to 'glycerol' and 'fatty acids'. 'Excess lipid mobilization and beta-oxidation' is shown as a process that also leads to 'ROS'. 'Free fatty acids' are shown in a yellow container. 'Insufficient brain energy supply' is shown as a brain with a yellow arrow pointing to it from 'ATP'. 'Higher risk of metabolic disease' is shown at the bottom. The diagram also shows 'triglyceride' and 'fatty acids' being released from a cell and entering a blood vessel.

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