Proinflammatory Cytokines and miRNA: Identifying Novel Biomarkers of Immune Dysfunction in Schizophrenia

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Schizophrenia (SCZ) is a rather widespread, devastating psychiatric illness without defined causes. Studies have implied an immunological dysfunction hypothesis for SCZ by identifying abnormal levels of immune-regulating proteins such as cytokines and microRNAs in patient serum. To further understand how immune abnormalities contribute to SCZ, the relationship between immune-regulating proteins including cytokines and miRNAs was examined in CSF from SCZ patients and in the human neural progenitor cell line ReNcell CX. It was found that first-episode SCZ patients have elevated cytokines and differentially express miRNAs in CSF compared to healthy controls. A significant negative correlation existed between IL-6 and miR-660 in SCZ patients suggesting that this cytokine regulates the expression of the miRNA. Successful recreation of this relationship in ReNcell CX further suggests that the correlation contributes to pathogenesis. In addition to identifying novel immune irregularities in schizophrenic patients, this study uniquely intertwines the immune and genetic hypotheses. The identified anomalies in cytokines suggest abnormal immune regulation, which leads directly to the variations in miRNA and, likely, to changes in gene expression. The newly identified, interdisciplinary irregularities have the potential to be translated into targets for the development of novel pharmaceuticals that can improve the human condition.

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