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“The Effect of Methotrexate Treatment on Neuroinflammation Gene Expression in Pediatric Cancer Patients”

Abstract

Methotrexate, a structural analogue of folic acid, is one of the most effective and widely used drugs for treating various types of cancer, particularly leukemias and lymphomas. Methotrexate treatment in pediatric patients has been associated with the long-lasting development of detrimental neurological and psychosocial sequela following cancer survival. These deficits, termed late effects, persist after the methotrexate exposure and may include abnormal behavior such as unusual aggression, problems with executive functioning and processing speed as well as mental disorders like ADHD, depression, and anxiety. Our study includes a retrospective review of neurological and psychosocial evaluations from pediatric cancer survivors enrolled in the Late Effects Clinic at Children's Hospital New Orleans, Louisiana (CHNOLA). We will also use targeted RNA microarray and bioinformatic analysis of neuroinflammation genes in brain specimens obtained from deceased patients from the Pathology Department at CHNOLA. Results from the present study will provide information regarding gene-environment interactions and thus reveal candidate risk genes and pathways contributing to neurocognitive and psychiatric late effects.