Schizophrenia diagnosis associated with progressive brain changes among adolescents

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Adolescents diagnosed with schizophrenia and other psychoses appear to show greater decreases in gray matter volume and increases in cerebrospinal fluid in the frontal lobe compared to healthy adolescents without a diagnosis of psychosis, according to a report in the January issue of *Archives of General Psychiatry*.

"Progressive loss of brain gray matter (GM) has been reported in childhood-onset schizophrenia; however, it is uncertain whether these changes are shared by pediatric patients with different psychoses," the authors write as background information in the study.

Celso Arango, M.D., Ph.D., of the Hospital General Universitario Gregorio Marañón, Madrid, Spain, and colleagues, examined the progression of brain changes in first-episode early-onset psychosis and the relationship to diagnosis and prognosis at two-year follow-up among patients at six child and adolescent psychiatric units in Spain. The authors performed magnetic resonance imaging (MRI) of the brain for 61 patients (25 diagnosed with schizophrenia, 16 with bipolar disorder and 20 with other psychoses) and 70 healthy control participants. MRI scans were conducted at study baseline and after two years of follow-up.

Compared with control patients, those diagnosed with schizophrenia showed greater gray matter volume loss in the frontal lobe during the two-year follow-up. Patients with schizophrenia also showed cerebrospinal fluid increase in the left frontal lobe. Additionally, changes for total brain gray matter and left parietal gray matter were

significantly different in patients with schizophrenia compared with patients in the control group.

Among patients with schizophrenia, progressive brain volume changes in certain areas were related to markers of poorer prognosis, such as more weeks of hospitalization during follow-up and less improvement in negative symptoms. Greater left frontal gray matter volume loss was related to more weeks of hospitalization whereas severity of negative symptoms correlated with cerebrospinal fluid increase in patients with schizophrenia.

The authors did not find any significant changes in patients with bipolar disorder compared to control patients, and longitudinal brain changes in the control group were consistent with the expected pattern described for healthy adolescents.

"In conclusion, we found progression of gray matter volume loss after a two-year follow-up in patients who ended up with a diagnosis of schizophrenia but not bipolar disease compared with healthy controls," the authors write. "Some of these pathophysiologic processes seem to be markers of poorer prognosis. To develop therapeutic strategies to counteract these pathologic progressive brain changes, future studies should focus on their neurobiological underpinnings."

More information: *Arch Gen Psychiatry*. 2012;69[1]:16-26.

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