Brain differences detected in children with depressed parents

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The largest brain imaging study of children ever conducted in the United

States has revealed structural differences in the brains of those whose parents have depression.

In Brief

Depression is a common and debilitating mental health condition that typically arises during adolescence. While the causes of depression are complex, having a parent with depression is one of the biggest known risk factors. Studies have consistently shown that adolescent children of parents with depression are two to three times more likely to develop depression than those with no parental history of depression. However, the brain mechanisms that underlie this familial risk are unclear.

A new study, led by David Pagliaccio, Ph.D., assistant professor of clinical neurobiology in the Department of Psychiatry at Columbia University Vagelos College of Physicians and Surgeons, found structural differences in the brains of children at high risk for depression due to parental depressive history.

The study was published in the *Journal of the American Academy of Child & Adolescent Psychiatry*.

What the Study Found

The researchers analyzed brain images from over 7,000 children participating in the Adolescent Brain Cognitive development (ABCD) study, led by the NIH. About one-third of the children were in the high-risk group because they had a parent with depression.

In the high-risk children, the right putamen—a brain structure linked to reward, motivation, and the experience of pleasure—was smaller than in children with no parental history of depression.

What the Study Means

Randy P. Auerbach, Ph.D., associate professor of medical psychology at Columbia University Vagelos College of Physicians and Surgeons and senior author of the study, notes, "These findings highlight a potential risk factor that may lead to the development of depressive disorders during a peak period of onset. However, in our prior research, smaller putamen volumes also has been linked to anhedonia—a reduced ability to experience pleasure—which is implicated in depression, substance use, psychosis, and suicidal behaviors. Thus, it may be that smaller putamen volume is a transdiagnostic risk factor that may confer vulnerability to broad-based mental disorders."

Dr. Pagliaccio adds that, "Understanding differences in the brains of children with familial risk factors for depression may help to improve early identification of those at greatest risk for developing depression themselves, and lead to improved diagnosis and treatment. As children will be followed for a 10-year period during one of the greatest periods of risk, we have a unique opportunity to determine whether reduced putamen volumes are associated with depression specifically or mental disorders more generally."

More information: David Pagliaccio et al, Brain Volume Abnormalities in Youth at High Risk for Depression: Adolescent Brain and Cognitive Development Study, *Journal of the American Academy of Child & Adolescent Psychiatry* (2019). DOI: 10.1016/j.jaac.2019.09.032

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