Anxiety in young women may arise from imbalance between two brain chemicals

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The development of anxiety in girls and young women may stem from an imbalance between two crucial brain chemicals, gamma-aminobutyric acid (GABA) and glutamate, according to a new study from the

University of Surrey. This discovery offers promising insights into potential treatment avenues for girls and women dealing with anxiety.

The study revealed that as young women mature, the levels of GABA (a calming brain chemical) increase, while those of glutamate, known for its role in boosting brain activity, decrease. The paper is published in the journal *Developmental Cognitive Neuroscience*.

"Our research indicates that the equilibrium between GABA and glutamate in the dorsolateral prefrontal cortex serves as a vital indicator of anxiety levels. While glutamate propels brain activity, GABA acts as a brake. Our findings suggest that anxiety, often characterized by impaired rational thought, is intricately linked to the overactive braking system in the brain," says Dr. Nicola Johnstone, research fellow.

These revelations not only shed light on the underlying mechanisms of anxiety but also pave the way for targeted interventions that address the delicate balance of GABA and glutamate in the brain.

The study included 81 participants from two age groups: 49 participants aged 10–12 years, and 32 participants aged 18–25 years. The team used a brain imaging technique called magnetic resonance spectroscopy to measure the levels of the brain chemicals in different areas of the brain.

"Grasping how key brain chemicals, GABA and glutamate, fluctuate during important growth stages like adolescence is vital for spotting and stopping anxiety disorders early. This study shines a light on the possibility of focusing on these brain chemicals for new treatments, particularly in young women," says Dr. Kathrin Cohen Kadosh.

By unraveling the mysteries of brain chemistry, the researchers aim to offer more effective treatments for anxiety, ultimately empowering girls and young women to lead healthier, more fulfilling lives.

More information: Nicola Johnstone et al, Excitatory and inhibitory neurochemical markers of anxiety in young females, *Developmental Cognitive Neuroscience* (2024). DOI: 10.1016/j.dcn.2024.101363