

Schizophrenia may give early warnings

April 4 2013, by Renee Elder

Changes in brain function may foreshadow schizophrenia as early as puberty, nearly a decade before most patients begin showing obvious symptoms, new research from the University of North Carolina shows.

Researchers in Chapel Hill looked at brain scans of 42 children, some as young as 9, who had close relatives with schizophrenia. They saw that many of the children already had areas of the brain that were "hyper-activated" in response to emotional stimulation and tasks that required decision-making, said Aysenil Belger, associate professor of psychiatry at the UNC School of Medicine and lead author of the study.

"These children are trying extra hard to do something that other children are able to do without so much effort," Belger said.

Belger said her team's findings could help establish an earlier diagnosis of the [brain disease](#) and ultimately point to techniques for offsetting or minimizing [disease progression](#).

"We are interested in seeing if we can find some way to intervene," Belger added.

Among the possibilities for treatment are hormone therapies, [cognitive skills](#) training and [new medicines](#) to improve [brain function](#).

People who have a parent or [sibling](#) with schizophrenia are about 10 times more likely to develop the disease than those who do not. Signs of the illness typically begin in the late teens to mid-20s. These include

declines in memory, intelligence and other brain functions that indicate a weakening in the brain's processing abilities. More advanced symptoms may include paranoid beliefs and [hallucinations](#).

Belger and her research team have been involved in previous studies that identified at-risk teens beginning at age 16.

The latest study, published in the March 6 issue of the online journal *Psychiatry Research: Neuroimaging*, intentionally drew its subjects from a younger age group.

"We were interested in seeing if being a first-degree family member of someone with schizophrenia meant their brains were already different," Belger said.

The scientists examined brain activity using functional magnetic resonance imaging while the children solved problems or viewed pictures designed to trigger emotional responses.

"Puberty is a particularly important time because that's when the brain changes tremendously, both functionally and structurally," Belger said. "These changes are accompanied by cognitive and emotional changes, but they don't all happen at the same pace. The emotional area tends to develop faster than the decision-making areas. That's why teenagers are very emotional and impulsive. For most people, this imbalance is temporary - when [puberty](#) is over, at some point, your cognition and emotions become regulated. But for some people this doesn't happen."

The researchers hope to learn more about brain development in at-risk youth by continuing to follow the subjects of their research over the next several years.

"Of all the people who seem to have compromised circuitry in their

brain, if we come back and image them in later years, some may be moving toward the cluster of symptoms for schizophrenia while others may have other types of deficits," such as bipolar disorder or attention deficit disorder, Belger said.

Still others may avoid serious disorders altogether.

"Our brains all have different strengths and can be efficient in different ways," Belger said. "Some may be able to compensate. We don't exactly understand all the key components at play here."

The team's research is being funded by the National Institute of Mental Health and the National Institute of Child Health and Human Development. Co-authors included Diana Perkins, who is the founder and director of UNC's Outreach And Support Intervention Services program for adolescents and young adults who are experiencing or are at risk for developing psychosis.

Tyrone Cannon, a professor of psychology at Yale University who has worked with Belger and Perkins on previous research, said the latest findings line up with studies showing that these brain disorders often start with increased neurological activity.

"When you have a brain that is only partially disordered, the individual can sometimes still compensate by activating even more in those areas that are used to solve the task," Cannon said.

Environment and other factors also come into play, but are not well understood, Cannon pointed out.

However, researchers have determined that individuals with [brain](#) disorders such as [schizophrenia](#) or bipolar typically cope better in settings where relationships and social expectations are consistent.

"The best way to reduce all these negative stress hormones is through a predictable social environment that is tight-knit emotionally," Belger explained. "That means having friends or other people around who can provide social feedback and warmth."

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