

Experts, actor clash on cause of mental ills

By Tina Hesman

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The doctor just couldn't accept what he was hearing.

"I was shaking my head in disbelief, saying, 'This can't be happening. Not in 2005,'" said Dr. Charles Conway, medical director of inpatient psychiatry at St. Louis University.

The source of his dismay was a television interview with actor Tom Cruise. The star of the movie "War of the Worlds" wasn't talking up his film, which opened Wednesday, or even his latest romance. Instead he criticized actress Brooke Shields for taking antidepressants for postpartum depression and declared that there is no such thing as a chemical imbalance in the brain.

Cruise's religious beliefs - the actor is a Scientologist - clash with the overwhelming weight of scientific evidence on the matter of mental illness, neuroscientists say.

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"It's safe to say that we know that metabolic changes in the brain are present for all major mental illnesses," Conway said.

The case for brain changes accompanying mental illnesses such as schizophrenia, depression, bipolar disorder and autism is closed, experts say. Now the debate is over which changes lead to mental illness and which are the result of having the disease, said Dr. Kelly Botteron, an associate professor in the departments of psychiatry and radiology at Washington University.

Botteron and other researchers are turning to brain imaging studies and genetics to help solve the chicken-and-egg question and figure out how to improve treatment of mental illnesses. The solution may lie in unraveling the complex interaction between genes and everyday life.

Scientists have identified some genes that clearly play a role in causing mental illnesses such as depression, said Dr. Joseph Coyle, a professor of psychiatry and neuroscience at Harvard University School of Medicine. But it's not enough to say that a person gets sick because his or her brain is wired that way, he said.

The brain is not a static organ; it rewires itself with new experiences,

Coyle said. In people who have genes that predispose them to mental illness, negative events, such as abuse, neglect or other traumatic experiences, may result in faulty circuitry, which leads to depression or other psychiatric disorders, he said.

Scientists know that genes aren't the sole cause of mental illness from studying identical twins. Identical twins come from the same fertilized egg and are alike in 100 percent of their genes.

But the identical twin of a person with schizophrenia has only a 50 percent chance of developing the disorder. Life experience determines the rest. Schizophrenia has been linked to harm to the brain that happens at birth or even before. Babies who suffer low oxygen to the brain during birth are more likely to develop schizophrenia, said Deanna M. Barch, an associate professor in the Department of Psychology at Washington University. Children of mothers who got the flu in the second trimester of pregnancy also have a greater risk of getting schizophrenia, she said.

But Barch stressed that only people who already have a genetic susceptibility to developing the psychosis would be more likely to get schizophrenia after those early life problems.

Environment also can help protect against mental illness, even when a person has a form of a gene associated with mental illness, Coyle said.

"If you have the form (of the gene) that confers vulnerability to depression, but your life is like 'Leave it to Beaver,' you'll probably come out all right," Coyle said.

Barch studies the siblings of people who have schizophrenia, looking for clues about the types of brain changes that may lead to the disease. About 10 percent to 15 percent of brothers and sisters of people with schizophrenia will develop the disease, while only about 1 percent of people in the general population get the mental illness. That means that siblings of schizophrenics are more likely than people without a family history of the disease to show signs of the brain disorder.

Researchers have found that people who have schizophrenia and their at-risk siblings have altered levels of a brain chemicals called N-acetylaspartate and dopamine.

The researchers also have detected changes in the structure and function of other brain regions in people with schizophrenia and some of their siblings. The hippocampus, a seahorse-shaped region of the brain involved in memory, is shrunken in schizophrenics. Changes also occur in the thalamus, a part of the brain that helps coordinate communication

throughout the brain, and in the dorsal lateral prefrontal cortex, the portion of the brain that controls decision making, problem solving, language and social regulation.

Botteron has found changes in the size and activity of a structure called the amygdala in the brains of depressed women when compared to the brains of nondepressed women. That structure helps set the context of an experience, telling the person whether it's a fearful situation or a happy one. People with depression are often unable to tell the difference between the two.

Barch, Botteron and others would like to use these types of changes to predict who is most likely to develop schizophrenia, depression and other mental illnesses. But the changes are often slight, Barch said.

"It's not a big hole in the head or anything," she said.

Technology is not yet advanced enough to actually diagnose mental illness with brain scans alone.

The same is true for other illnesses, Botteron said.

"We can't just look at a heart and diagnose a condition without EKGs and blood tests," she said.

But science has clearly shown that leaving mental illnesses untreated is bad for the brain, scientists say. Depression elevates levels of a stress hormone called cortisol, Botteron said. That hormone causes the hippocampus to shrink, leading to memory and learning problems and making the disease last longer and become more severe.

Scientists have shown that antidepressants and talk therapy can restore health to the brains of depressed people and even may help inoculate against future episodes of depression, Conway said.

Reporter Tina Hesman
E-mail: thesman@post-dispatch.com
Phone: 314-340-8325