

Differences in Brain Function May Increase Addiction Risk

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New research looks at how pre-existing differences in the workings of the brain may predispose some people to substance abuse.

“[Addiction is a brain disease](#) because differences in the way our brains function make some people more likely to become addicted to drugs than others — just as differences in our bodies make some people more likely to develop cancer or heart disease,” said researcher Lynn Oswald, Ph.D., R.N.

Currently, the neurobiological mechanisms that underlie a person’s risks for alcohol and drug abuse are not well understood by scientists. Oswald’s research is directed at answering why some people become addicted to drugs and others do not.

“There is growing evidence that vulnerability for substance abuse may stem from pre-existing variances in brain function,” she said.

“These variations could be something that a person is born with or the result of changes that take place later on. Like other chronic diseases such as diabetes and heart disease, risks for drug use disorders seem to be influenced by both genes and environment.

“Scientific evidence continues to grow about the effects of environmental stress on the body. We now know that the brain is a very plastic organ and various life experiences, such as severe stress, can also change the way the brain works.”

Oswald and her colleagues are combining psychological and behavioral assessments with PET (positron emission tomography) scans of the brain to examine whether factors such as increased impulsivity and chronic stress affect brain dopamine systems in ways that could increase one’s risks for drug abuse.

“The advantage of this kind of team approach is that it allows investigators with different backgrounds to combine their talents to study the inner workings of complex human problems from multiple levels,” Oswald said. “Right now we know that certain things such as stress and impulsivity are associated with greater risks for addiction, but we don’t know why.”

Scientists have known that the [dopamine neurotransmitter system](#) in the brain plays an important role in drug abuse. Oswald’s hypothesis is that preexisting differences in brain dopamine function may predispose some people to be at greater risk of addiction than others.

“Although much of what scientists know about brain function in addiction has come from animal research, advances in [neuroimaging methods](#) over the past decade now make it possible to look at some of these processes in living humans,” she says.

“These developments have led to exciting new opportunities for expanding knowledge about addiction and other psychiatric conditions. Nevertheless, more is currently known about how drugs affect the brain and about how brain function is altered in drug addicts than is known about mechanisms that contribute to vulnerability for these disorders.

“Better understanding can ultimately lead to better targeting of prevention and treatment methods,” Oswald said.

An expanded knowledge of the brain’s dopamine system may lead to promising advances as the system is believed to be involved in psychiatric disorders as Tourette syndrome, [schizophrenia](#), and possibly [attention deficit hyperactivity disorder](#).

Source: University of Maryland Baltimore