

Study links attempted suicide with genetic evidence identified in previous suicide research

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A Johns Hopkins-led study has found evidence that a genetic tendency toward suicide has been linked to a particular area of the genome on chromosome 2 that has been implicated in two additional recent studies of attempted suicide.

“We’re hoping our findings will eventually lead to tests that can identify those at high risk for attempting suicide,” says Virginia Willour, Ph.D., an assistant professor in the Department of Psychiatry at the Johns Hopkins University School of Medicine and lead author of the study. An estimated 4.6 percent of Americans ages 15 to 54 have tried to take their lives, according to Willour.

The investigators conducted a family linkage study in which they searched for commonalities in the genomes of family members with bipolar disorder and a history of attempted suicide. The same gene region on chromosome 2 that was identified by this bipolar disorder and attempted suicide study was recently identified by two complementary family studies that looked at attempted suicide in families with major depression and alcohol dependence.

“Family linkage studies are not always consistent, so the fact that all three studies, including ours, point to the same region of the genome is a good indication that we are on the right track toward identifying a gene or genes that play a role in why a person chooses to take his or her own

life,” says Willour.

In the multi-institutional study, results of which appear in the March issue of *Biological Psychiatry*, the researchers examined data from 162 families with bipolar disorder. They looked at attempted suicide in this sample because it is an important clinical problem that tends to occur more often in some of these families than in others, suggesting a distinctive genetic basis, according to senior author James B. Potash, M.D., M.P.H., of the Department of Psychiatry at Hopkins. This technique, of looking at sub-types of illness, is used by genetic researchers as a way to reduce genetic complexity.

From the 162 families, the researchers selected 417 subjects who were diagnosed with schizoaffective/bipolar disorder, bipolar I disorder or bipolar II disorder.

These subjects were asked whether they had ever attempted suicide and the degree of intent of the most serious attempt. One hundred fifty-four subjects said they had attempted suicide, and 122 stated that they had “definite” intent. For the purpose of this study, the latter were considered to have a history of attempted suicide.

Data for all 417 subjects was entered into a computer program that looks for genetic similarities between subjects with similar psychological profiles. Results indicated that family members with a history of attempted suicide and bipolar disorder showed a high degree of genetic similarity at a specific area -- DNA marker D2S1777 -- on a section of chromosome 2 referred to as 2p12. This is the same marker implicated in a 2004 study from the University of Pittsburgh School of Medicine that looked at attempted suicide and major depression. And it is close to another marker, D2S1790, located in the 2p11 region of chromosome 2, which was identified in a 2004 study from the University of Connecticut School of Medicine that looked at alcoholism and attempted suicide.

Willour says that although the Hopkins-led study does not pinpoint a specific gene responsible for attempted suicide, it does suggest a “neighborhood” in which the gene might be found. She adds that the next step is to further narrow the search and find the “address.” “Once we have located the specific gene,” she says, “we can better identify people who might be at risk of suicide and offer drug companies a target for possible therapies.”

The data used by Willour and her team -- DNA samples, medical histories and psychiatric evaluations -- came from an independent study, CHIP, conducted at the University of Chicago, Johns Hopkins, and the National Institute of Mental Health (NIMH) Intramural Program. The purpose of CHIP, initiated in 1988 and funded through at least 2010, is to find genes that predispose people to developing bipolar disorder or particular subtypes of the illness.

Source: Johns Hopkins Medical Institutions

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