Genetic mutations associated with suicide risk among patients with depression

February 1 2010

Single mutations in genes involved with nerve cell formation and growth appear to be associated with the risk of attempting suicide among individuals with depression, according to a report posted online today that will appear in the April print issue of *Archives of General Psychiatry,* one of the JAMA/Archives journals.

An estimated 10 to 20 million suicides are attempted each year around the world, and 1 million are completed, according to background information in the article. Patients with psychiatric disorders are more likely to attempt suicide, and those with depression or other mood disorders are at higher risk. "Twin and family studies suggest that suicide and suicide attempts are heritable traits and likely part of the same phenotype, with completed suicide and suicide attempts clustering in the same families," the authors write. "The genetic risk factors for suicide appear to be independent from the underlying psychiatric disorder."

Martin A. Kohli, Ph.D., then of the Max Planck Institute of Psychiatry, Munich, Germany, and now of the John P. Hussman Institute for Human Genomics, Miami, and colleagues investigated genetic variants among 394 depressed patients, including 113 who had attempted suicide, and 366 matched healthy control participants. The authors then replicated their results in 744 German patients with major depressive disorder (152 of whom had attempted suicide) and 921 African American non-psychiatric clinic patients (119 of whom had attempted suicide).

The researchers investigated single-nucleotide polymorphisms (SNPs, or

variants in a single base pair along a strand of DNA) in two genes associated with the neurotrophic system (which produces proteins involved in nerve cell growth). Five SNPs appeared significantly more common among individuals with a history of suicide attempts. Carriers of the three most significant markers had a 4.5-fold higher risk of attempting suicide than those who carried none of the three mutations.

"The facts that the genetic associations with suicide attempts were stronger when comparing depressed patients with suicide attempts vs. depressed patients without suicide attempts than with healthy control subjects and that these SNPs were not associated with major depressive disorder suggest that these associations are specific to suicide attempts" and not linked to depression in general, the authors write.

"This supports the large body of evidence that dysfunctional neurotrophic signaling might be involved in the pathophysiology of suicidal behavior," they conclude.

More information: Arch Gen Psychiatry. 2010;67[4]. doi:10.1001/archgenpsychiatry.2009.201

Provided by JAMA and Archives Journals