The Relationship of Suicide Risk to Family History of Suicide and Psychiatric Disorders

December 01, 2003 | Addiction [1], Suicide [2]
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Two of the most prevalent risk factors for suicide are family history of suicide and family history of psychiatric illness. Are these factors independent of each other? What role does genetics play? How can research in this area assist prevention programs?

According to the National Institute of Mental Health, family history of suicide and mental or substance abuse disorder are among the most prevalent risk factors for suicide in the United States. Although only a small proportion of people have such a family history, mental health care professionals should be aware of their strong influence and should be attentive to relevant signs while dealing with suicidal people, particularly adolescents and young adults. **Risk Associated With Family History**

Evidence that suicide can run in families has been found in both case reports and epidemiological studies. A well-known case is the novelist Ernest Hemingway's family, in which five members over four generations died from completed suicides. Epidemiological studies, based on clinical patients or community samples, have consistently demonstrated a significantly higher risk for suicidal behavior among family members of suicide victims and attempters (Gould et al., 1996; Kendler et al., 1997). Studies of twins have shown that monozygotic twin pairs have significantly greater concordance for both completed and attempted suicide than dizygotic twin pairs (Glowinski et al., 2001; Roy et al., 1991), while one adoption study indicated that suicide is more common among biological relatives of adopted suicides than among biological relatives of adopted controls (Wender et al., 1986). Our study, which included all 21,168 suicides during a 17-year period in Denmark and used data from Danish longitudinal registers, on the general population level, demonstrated that suicide mortality in the first-degree relatives of suicide victims is about 3.5 times that in the first-degree relatives of live controls who are matched for age, sex and date of suicide (Qin et al., 2003). We also found that people with a family history of completed suicide, as compared with those without such a family history, are at a 2.1-fold increased risk of committing suicide even after adjusting for differences in individual socioeconomic status and psychiatric history. These findings suggest that suicidality clusters in families, to some extent, may be genetically transmitted.

At the same time, suicide tends to occur in families with psychiatric history. With respect to the Hemingway family, a number of the family members, including the novelist himself, suffered mental and/or substance abuse disorders. Previous studies have demonstrated that psychiatric disorders are more prevalent among kinsfolk of people who are suicidal, and people with a family history of psychiatric illness are at an increased risk for completed or attempted suicide (Gould et al., 1996; Wagner, 1997). Qin et al. (2003) showed that, in the context of other risk factors, there is an approximately 1.3 relative risk for completed suicide associated with a family history of psychiatric illness leading to hospitalization. One study consistently demonstrated that an increased risk was associated with a parent's psychiatric history but that the relative risk was not significantly different according to the parent's diagnosis of psychiatric illness (Agerbo et al., 2002). Since suicide and psychiatric illness often co-occur, does apparent familiality reflect suicide specifically or an association with familial psychiatric illness? In order to gain insight in this matter, we conducted another study that included 4,262 suicide victims and 80,238 population-based controls (Qin et al., 2002). This study demonstrated that a completed suicide and a hospitalized psychiatric disorder in a parent or sibling act independently as risk factors for suicide in the general population. Their effects could not be explained by socioeconomic, demographic and psychiatric status differences in the population. Our findings also demonstrated that a family history of psychiatric illness significantly interacts with an individual's psychiatric status, increasing suicide risk only in people without a psychiatric hospitalization history, whereas a family history of completed suicide significantly increased suicide risk independently of a family history of psychiatric disorders.
or mental illness in subjects. These results further suggested that suicide clusters in families are independent of familial cluster of psychiatric disorders, and that a family history of psychiatric illness only increases suicide risk through increasing the risk for developing a mental disorder, while a family history of completed suicide significantly increases suicide risk in its own right. **Mechanism Beyond the Familial Aggregation**

Compared with the amount of evidence suggesting that the aggregation of psychiatric disorders in families is largely due to genetic factors, far less is known about the mechanism of the familial clustering of suicide. The overall findings from clinical, twin, adoption and laboratory molecular genetic studies suggest that there is a genetic susceptibility to suicidal behavior in people with severe stress or mental disorders. Our results regarding the independent effects of the two familial factors and their interactions strongly suggest that the genetic susceptibility to suicide is likely to act independently of psychiatric illness.

Aggregation of suicide is probably due to genetic factors related to, for example, aggressive behavior or impulsiveness in families. A recent study in the United States tested this hypothesis and concluded that familial loading for suicide attempts may affect rates of transmission as well as age at onset of suicidal behavior (Brent et al., 2003). This study also found that the effect is likely to be mediated by the familial transmission of impulsive aggression.

Scientists now think that there is an association between suicidal behavior and the molecular genetics of the neurotransmitter serotonin. Several studies have indicated that the tryptophan hydroxylase (TPH) genotype is associated with concentration of the serotonin metabolite (5-HIAA) in the cerebrospinal fluid (CSF), and low level of CSF 5-HIAA is associated with suicidal and aggressive behavior. Yet suicidality is probably a phenotype that is determined by multiple genes and influenced by environmental factors. Tryptophan hydroxylase may be one of several genes involved; therefore, more studies are needed to reveal the mechanism beyond. **Suggestion for Suicide Prevention**

When transforming the effect size of suicide risk associated with family history and its distribution in the cases of completed suicide into the population attributable risk, a family history of completed suicide accounted for 2.25% of the total suicides while a family history of hospitalized psychiatric illness accounted for 6.80% of the suicides (Qin et al., 2002). This means that if all individuals had a similar risk to those not exposed to family history of completed suicide or psychiatric disorders, the proportion of suicides that would be prevented is about 9.1%, of which 2.3% would be attributed to family history of suicide. The attributable risk associated with family history is higher for younger people. For instance, Agerbo et al. (2002) estimated that, for people under age 21, about 12.8% of suicides would not occur if exposure to suicidal death and psychiatric illness in parents were eliminated. The estimations of attributable risk in these two studies were made after the adjustment for each subject's own psychiatric admission history and other risk factors and would be larger if exposures in other relatives, family history of suicide attempts and family history of psychiatric disorders that did not result in admission to hospital were included.

Therefore, inclusion of familial suicide history in the assessment of suicide risk is important, even though people with a family history of suicide are only a small proportion of the total number of people who committed suicide. Also, the importance of family psychiatric history should not be disregarded, because it can help to identify people vulnerable to mental disorders associated with suicide. These factors are essential in prevention programs targeting adolescents and young adults and might apply to the general population. Preventive strategies should be aimed at the early recognition and optimal treatment of mental illness. Supportive interventions may be indicated for the families of suicide victims.

Suicide is the complex result of many factors. Even if individuals have a family history of both suicide and psychiatric illness, they are not doomed. Having a family history, like exposure to any other risk factors, indicates that a person is at an increased risk in comparison to people without such exposures; it cannot predict if the person is destined to attempt or complete suicide. Psychiatrists, psychologists and all health-related professionals need to present appropriate interpretations of research findings to individuals who become depressed due to the awareness of their family history to help them restore their confidence in life.

References: References

2. Brent DA, Oquendo M, Birmaher B et al. (2003), Peripubertal suicide attempts in offspring of


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