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Biomarkers of Suicidality

[Peter Roy-Byrne, MD](#) reviewing *Le-Niculescu H et al. Mol Psychiatry 2013 Aug 21.*

Four blood biomarkers of gene expression predict hospitalizations for suicide in patients with bipolar disorder or schizophrenia.

Suicidal ideation only weakly predicts attempted and completed suicide, and some patients never voice ideation before they attempt suicide. These investigators used a multistage research protocol to identify suicide risk biomarkers.

First, the researchers identified 246 genes differentially expressed during suicidal and nonsuicidal states in 9 bipolar patients participating in a longitudinal study. They next cross-matched these data with extant postmortem brain and genetic data from studies on suicide. The 41 identified genes involved stress, inflammation, and apoptosis pathways in the brain, and some were sensitive to clozapine, the only FDA-approved drug for suicidality. The biomarkers were reduced to 6 after an examination of blood samples from a coroner's cohort of nine people who completed suicide. Four biomarkers predicted past and future hospitalizations for suicidality in 42 bipolar and 46 schizophrenia patients. One gene, *SAT1*, showed substantial predictive power. *SAT1*, when combined with simple analog ratings of anxiety and depression, predicted suicide hospitalization with 81% accuracy.

Comment

This study shows the powerful possibilities of using blood-cell gene-expression profiles to identify individuals at high risk for suicide, without requiring reports of suicidal ideation. Depression and anxiety ratings added to the predictive power of *SAT1*, which by itself had predictive power only slightly better than chance. The study is limited by its focus on severely mentally ill patients with bipolar illness or schizophrenia. Although these patients have an extremely high suicide risk, they contribute relatively little to the overall population risk given the low prevalence of these conditions. Researchers should next examine these genes in suicidal individuals with mood, anxiety, and substance use disorders and use the multistage strategy to identify the same or, possibly, new risk genes in these disorders.

[Editor Disclosures at Time of Publication](#)

Citation(s):

1. *Le-Niculescu H et al. Discovery and validation of blood biomarkers for suicidality. Mol Psychiatry 2013 Aug 21; [e-pub ahead of print].*
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