

Differences Between Suicide Attempters and Nonattempters in Depressed Older Patients: Depression Severity, White-Matter Lesions, and Cognitive Functioning

Natalie Sachs-Ericsson, Ph.D., Jennifer L. Hames, M.S., Thomas E. Joiner, Ph.D., Elizabeth Corsentino, M.S., Nicole C. Rushing, M.S., Emily Palmer, B.S., Ian H. Gotlib, Ph.D., Edward A. Selby, Ph.D., Steven Zarit, Ph.D., David C. Steffens, M.D., M.H.S.

Objectives: *The population of older adults with major depressive disorder (MDD) has the highest rate of suicide. White-matter brain lesions (WML) are a potential biologic marker for suicidality in young and middle-aged adults and are correlated with cognitive impairment in older adults. In this study of older patients with MDD, we examined 1) if a history of suicide attempts was associated with a more severe course of MDD; 2) if WML are a biologic marker for suicide; and 3) if suicide attempt history is associated with cognitive impairment mediated by WML. **Setting:** Data from the Neurocognitive Outcomes of Depression in the Elderly study. **Participants:** Depressed patients (60+) who had ever attempted suicide ($n = 23$) were compared with depressed patients (60+) who had not attempted suicide ($n = 223$). **Measurements:** Baseline and follow-up assessments were obtained for depressive symptoms (every 3 months) and cognitive functioning (every 6 months) over 2 years. Three magnetic resonance imaging scans were conducted. **Results:** At baseline, suicide attempters reported more severe past and present symptoms (e.g., depressive symptoms, current suicidal thoughts, psychotic symptoms, earlier age of onset, and more lifetime episodes) than nonattempters. Suicide attempters had more left WML at baseline, and suicide attempt history predicted a greater growth in both left and right WML. WML predicted cognitive decline; nonetheless, a history of suicide attempt was unrelated to cognitive functioning. **Conclusions:** Severity of depressive symptoms and WML are associated with suicide attempts in geriatric depressed patients. Suicide attempts predicted neurologic changes, which may contribute to poorer long-term outcomes in elder attempters. (Am J Geriatr Psychiatry 2013; ■:■-■)*

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Received January 4, 2012; revised June 4, 2012; accepted June 27, 2012. From the Department of Psychology, Florida State University (NS-E, JLH, TEJ, EC, NCR, EP); Department of Psychology, Stanford University, Stanford, CA (IHG); Department of Psychology, Rutgers University, Piscataway, NJ (EAS); Department of Human Development and Family Studies, Penn State University, University Park, PA (SZ); and Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC (DCS). Send correspondence and reprint requests to Natalie Sachs-Ericsson, Ph.D., Department of Psychology, Florida State University, Tallahassee, FL 32306. e-mail: sachs@psy.fsu.edu

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Suicide Attempts in Depressed Older Patients

Older adults are disproportionately likely to die by suicide.¹ Major depressive disorder (MDD) is one of the conditions most commonly associated with suicide in older adults.² The severity of the disorder has been identified by some as a risk factor,^{3–5} particularly among the depressed older adults,⁶ though not all agree.⁷ Although suicide attempts do not need to be present to meet criteria for MDD,⁸ the presence of attempts may indicate a more severe course of the disorder. Indeed, long-term outcomes of older adults who have attempted suicide are poor.⁹

Studies of predominately younger and middle-aged individuals have identified white-matter lesions (WML) in the brain as a potential biologic marker for suicidality.^{10,11} A meta-analysis of four studies¹² found that suicide attempters had a significantly higher number of WML than nonattempters. Jollant and colleagues¹³ noted that neurocognitive dysfunctions (including WML) in suicidal patients may facilitate the development of a suicidal crisis during stressful circumstances. It is possible that the presence of WML may result in decreased cognitive ability to cope with life stressors, which may lead to increased risk for suicidal behavior.

In older depressed patients, WML have been found to be associated with cognitive impairment.¹⁴ Previous research has provided evidence that older depressed patients with prior suicide attempts had a greater burden of subcortical gray-matter hyperintensities than patients without such a history.¹⁵ This neurobiologic finding reinforces the idea that suicide in later life may be associated with the destruction of neural pathways critical to the regulation of mood, cognition, and behavior. However, the knowledge of WML associated with suicidality in older depressed adults is limited, and, to our knowledge, no study has examined if suicide attempts in the older adults predict growth in WML.

Given the association between WML and cognitive impairment in older adults,¹⁶ if WML are also associated with suicide attempts, we might expect to see differences in cognitive functioning between elder attempters and nonattempters. Researchers¹⁷ have demonstrated that older suicide attempters exhibited more impaired reward/punishment-based learning than older nonattempters. Dombrovski et al.¹⁷ suggested that their findings are consistent with lesions in the ventral prefrontal cortex.

These analyses used data from the Neurocognitive Outcomes of Depression in the Elderly (NCODE) study.¹⁸ We had three primary hypotheses. First, we predicted that compared with nonattempters, older depressed patients with a history of suicide attempts would report more severe symptoms of depression at baseline (e.g., more depressive symptoms and more psychotic symptoms), a more severe lifetime course of MDD (e.g., earlier age of onset and more lifetime episodes), and more residual symptoms of depression over time (including more suicidal ideation). Second, we predicted that attempters would have more WML at baseline than nonattempters and show more growth in WML over time. Finally, we hypothesized that attempters would have poorer baseline cognitive functioning and would have an increase in cognitive decline over time. Specifically, we predicted that WML might mediate the association between past suicide attempts and cognitive decline.

METHODS

We analyzed data from the NCODE study, a longitudinal study of geriatric depression at Duke University Medical Center (DUMC) supported by the National Institute of Mental Health.

Participants

Informed consent. Participants provided written informed consent. The research protocol is reviewed and approved annually by the DUMC institutional review board. Data analyses were conducted at Florida State University and were approved by the university's institutional review board.

Recruitment. Participant recruitment began in 1994 and continues to the present.

Depressed participants. Participants seeking treatment for depression were recruited for the NCODE study if they were nondemented adults older than 60, met *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* criteria for current MDD, and presented for inpatient or outpatient psychiatry services at DUMC or the Duke General Internal Medicine Clinic. Exclusion criteria included meeting criteria for another major psychiatric illness

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