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Cognitive deficits: Underappreciated contributors to suicide:

Invited Perspective on Negative Emotions and Suicidal Ideation During Psychosocial Treatments in Older Adults with Major Depression and Cognitive Impairment

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Worldwide, suicide rates rise with increasing age. In the US, the national suicide rate was 13.1 per 100,000 between 2012 and 2014, compared to 16.1 per 100,000 in the 65 and older age group. Bereavement, illness, and disability typical of aging contribute only modestly to suicide risk, leaving the unanswered question of what other factors may account for this pattern. Early accounts of the suicidal crisis emphasized the critical role of problem solving deficits in the emergence of a suicidal crisis (1). Indeed, problem-solving deficits may play an important role in the inability to solve conflicts, search for alternative solutions other than suicide, and in the occurrence of potentially controllable stressful life-events.

Fourteen to eighteen percent of elderly suffer from mild cognitive impairment (2). Even in non-demented elderly, the ability to make cognitively demanding decisions declines in old age (3). Older adults are more likely to be the victims of misleading advertising or other scams (3) and also make less advantageous decisions in the laboratory than younger individuals (4). This is partly explained by an age-related decline in cognitive control, related to the disproportionate effect of aging on the prefrontal cortex. It remains unclear to what extent cognitive aging explains higher suicide rates in older adults and whether there may be a certain phase of cognitive decline or a particular cognitive profile that predisposes to suicidal behavior. In a recent issue of this Journal, a nationwide longitudinal study from Taiwan reported that elderly who attempted suicide were prone to developing dementia in later life, independent of depression and medical comorbidities. Specifically, elderly who attempted suicide exhibited both an increased incidence (30% vs 6%) and a younger age of developing dementia (5).

The relative importance of suicide vulnerability factors may change across the life-cycle; for example impulsivity has been identified as a possible endophenotype for suicidal behavior, yet many older suicide attempters do not exhibit high levels of impulsivity. In contrast, cognitive deficits may be particularly important in late-life. Over the last decade there is accumulating evidence that understanding cognitive deficits (6, 7) and decision processes (4) associated with suicidal behavior and their relationship to other risk factors may help to identify people at risk for suicide, and help to develop individualized treatment strategies. Population studies have linked poor cognitive abilities (8) to suicidal behavior. Deficits in cognitive control represent the most consistent finding in both middle-aged and older suicide attempters (6, 9). Impairments in interference control and cognitive flexibility appear to be a particularly sensitive index related to medically serious suicide attempts (10). It is unclear, however, if these deficits are selective, and whether attention and working memory are also

affected (6). Moreover, these cognitive deficits seem to persist in older suicide attempters even when their depression remits (11).

The article by Kiosses and colleagues in this issue (Negative Emotions and Suicidal Ideation During Psychosocial Treatments in Older Adults with Major Depression and Cognitive Impairment) compared the effectiveness of two psychosocial interventions for homebound elderly with major depression and cognitive impairment on reducing negative emotions and suicidal ideation. They developed the Problem Adaptation Therapy (PATH) to improve problem solving and negative emotions in home-bound cognitively impaired depressed elderly. As the authors had reported previously, over the 12-week intervention, PATH reduced depression (MADRS total score) and disability (WHODAS total score) more than Supportive Therapy for Cognitively Impaired (ST-CI). Thirty-eight percent of participants in PATH achieved full remission of depression and an additional 25% achieved partial remission. In addition, PATH improved depression in patients who had failed one adequate trial of an antidepressant ($n = 31$). The sample ($n=74$) of old (mean 80 years old), cognitively impaired patients with a high level of disability is of great clinical interest and is rarely included in clinical trials and even more infrequently in trials that target suicidal ideation or behavior. In the current article Kiosses and colleagues report the course of negative emotions and suicidal ideation during the developed intervention. Highlighting the importance of negative emotions, PATH was associated with greater improvement in the MADRS emotional item subscale than ST-CI, and improved score on the MADRS emotional item subscale between lagged and follow-up interview predicted reduction in MADRS-SI at follow-up in both intervention arms. However, the two intervention groups did not differ with regard to suicidal ideation (MADRS-SI).

These are both promising and intriguing findings, as we gravely need interventions for suicide in cognitively impaired older adults. The authors do not however explain the similar levels of suicidal ideation in both study arms despite differential change in negative emotions. Relatively low level of suicidality among participants in this study may have contributed to this negative finding, as persons with active suicidal ideation (having intent or plan to carry out a suicide attempt) were excluded. Another limitation of the study is that they used a single item (MADRS Suicide item) to assess suicidality, and did not measure change in cognitive functions prior to and after the treatment. Optimally, future studies would include more sensitive measures for suicide risk and also include neuropsychological assessments. Social support is an important protective factor for suicidal behavior and the degree of caregiver involvement in the treatment arms could influence the main findings. Therefore description, and if necessary, control for degree of caregiver involvement is recommended.

We have reported previously that suicidal depressed older adults required twice the amount of time to respond to a traditional psychosocial intervention in combination with antidepressant treatment than non-suicidal depressed elderly (12). Thus innovative approaches such as PATH are critically needed. Conducting studies in home-bound cognitively impaired depressed elderly is very challenging. In order to fully evaluate the effectiveness of PATH, future studies should include participants with active suicidal ideation or a recent suicide attempt. Finally, among the subset of depressed individuals who

attempt suicide there is considerable heterogeneity, therefore a single biological vulnerability is unlikely. Rather than search for a common biological substrate of all suicidal behavior, we should aim to identify distinct pathways to suicide, of which cognitive impairment may be particularly important in late-life. For clinicians, these findings indicate the importance of cognitive evaluation in suicidal older adults, especially in cases of late-onset depression.

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