

## Problem solving therapy for the depression-executive dysfunction syndrome of late life

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### SUMMARY

**Background** The ‘depression executive dysfunction syndrome’ afflicts a considerable number of depressed elderly patients and may be resistant to conventional pharmacotherapy. Non-pharmacological approaches addressing their behavioral deficits may reduce disability and experienced stress and improve depression.

**Methods** This paper focuses on problem solving therapy (PST) because it targets concrete problems that can be understood by patients with executive dysfunction and trains patients to address them using an easy to comprehend structured approach.

**Results** We suggest that PST is a suitable treatment for patients with the depression-executive dysfunction syndrome because it has been found effective in uncomplicated geriatric major depression and in other psychiatric disorders accompanied by severe executive dysfunction. Furthermore, PST can address specific clinical features of depressed patients with executive dysfunction, especially when modified to address difficulties with affect regulation, initiation and perseveration.

**Conclusions** A preliminary study suggests that appropriately modified PST improves problem solving skills, depression and disability in elderly patients with the depression-executive dysfunction syndrome of late life. If these findings are confirmed, PST may become a therapeutic option for a large group of depressed elderly patients likely to be drug resistant. Copyright © 2008 John Wiley & Sons, Ltd.

KEY WORDS—depression; executive dysfunction; problem solving therapy

### INTRODUCTION

A large percentage of depressed elderly individuals also have cognitive impairment. The combination of impaired cognition and depressive symptoms doubles in frequency at each 5-year interval after the age of 70 years in community residents. Combined depression and cognitive dysfunction is present in 25% of 85-year-old subjects (Arve *et al.*, 1999).

Depressed patients often have disturbances in attention, speed of processing, and executive function even in the absence of dementing disorders (Kundermann *et al.*, 2000; Lockwood *et al.*, 2000). Processing speed and working memory impairments persist after remission of geriatric depression and may be a trait marker of this disorder (Nebes *et al.*, 2000). More than 42% of non-demented elderly patients with major depression had abnormal scores in the initiation/perseveration domain of the Dementia Rating Scale (Alexopoulos *et al.*, 2002b). Executive dysfunction and related cognitive abnormalities confer significant disability and add to adversity experienced by the depressed elderly person.

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## A PATIENT WITH DEPRESSION AND EXECUTIVE DYSFUNCTION

Mrs Q, a 79-year-old woman, developed depression after her daughter, who was her main support, moved to another state. The patient reports that her daughter was her 'touchstone', the person she could count on to help her with day-to-day activities, and could be relied on in a crisis. Since the move, Mrs Q reports being unable to conduct even the simplest tasks, such as grocery shopping, preparing meals, and keeping track of the medicine she must take. Upon further probing, she reports that when faced with having to complete these tasks, she finds them difficult to do—she cannot decide what she needs to buy, what she should eat, or how to develop a plan to remember taking her medicines. Her typical day starts with her intention to pay her bills, or to call her landlord about problems in her apartment, but instead she spends all day in her nightgown and accomplishes none of these tasks. In addition, she reports feeling tired and unmotivated, neglects her appearance, and has given up cooking and doing work around the house. Mrs Q complains of depressed mood and indicates that there is little reason for her to go on. Further, she reports that while she was always a bit of a procrastinator, it has only been since her daughter moved away that she began having difficulty with every-day activities. Her medical status is stable but she has a history of hypertension, atrial fibrillation, and a transient ischemic episode which resulted in reversible aphasia and right-sided hemiparesis 6 months earlier. On examination, Mrs Q is disheveled, her response to questions is retarded, and she is somewhat suspicious when presented with questions that she cannot readily understand. Her Mini Mental Examination score is 27. She is only able to list nine items that one can buy in a supermarket in 1 min and has a Stroop score 2 SD below the mean of normal elderly persons.

## THE DEPRESSION-EXECUTIVE DYSFUNCTION SYNDROME OF LATE LIFE

This syndrome has been conceptualized as a major depression with prominent frontostriatal dysfunction and has a clinical presentation consistent with medial frontal lobe syndrome. Elderly patients with major depression and executive dysfunction have more psychomotor retardation and apathy, and less agitation, guilt, and insight into their condition than cognitively unimpaired depressed patients (Alexopoulos *et al.*, 2002b). Executive dysfunction and

impaired processing speed persist after remission of geriatric depression (Butters *et al.*, 2000; Murphy and Alexopoulos, 2004). Although executive dysfunction sometimes progresses into dementia, most depressed elders with executive dysfunction do not become demented (Murphy and Alexopoulos, 2004).

Regardless of its etiology, executive dysfunction confers significant disability (Nadler *et al.*, 1993; Grigsby *et al.*, 1998). Executive dysfunction is the cognitive impairment most likely to result in impairment of instrumental activities of daily living (IADL) in depressed elderly patients (Kiosses *et al.*, 2001). In fact, geriatric depression contributes to IADL impairment mainly in patients with executive dysfunction, while it has limited impact on the function of patients with unimpaired executive function (Kiosses *et al.*, 2001). These observations suggest that executive dysfunction is persistent and disabling. It has been proposed that fronto-striato-limbic abnormalities predispose to both depressive symptoms and executive dysfunction in older adults (Alexopoulos, 2002). This view is supported by clinical as well as brain structure and brain function studies (Alexopoulos, 2005).

## TREATMENT RESPONSE OF GERIATRIC DEPRESSION WITH EXECUTIVE DYSFUNCTION

Several studies suggest that executive dysfunction compromises treatment outcomes in elderly patients treated with antidepressants. Specifically, impairment in some executive functions predict poor or slow response to antidepressant treatment (Leuchter *et al.*, 1994; Hickie *et al.*, 1995; Simpson *et al.*, 1998; Kalayam and Alexopoulos, 1999; Potter *et al.*, 2004; Alexopoulos *et al.*, 2005) as well as early relapse and recurrence of geriatric depression (Alexopoulos *et al.*, 2000). The association of DRS-IP with poor or delayed response was noted both in demented and non-demented depressed subjects. Furthermore, microstructural abnormalities lateral to the anterior cingulate gyrus (Alexopoulos *et al.*, 2002a) and high amplitude of the frontal error negative wave during performance of tasks requiring anterior cingulate functional integrity were associated both with poor executive dysfunction and poor response to selective serotonin reuptake inhibitors (Kalayam and Alexopoulos, 2003).

Executive dysfunction may be part of minimal cognitive impairment, subclinical stage dementing disorders, pronounced aging-related cognitive changes, and medical disorders. Regardless of its causes, executive dysfunction appears to have a specific relationship

to poor and unstable drug response, while overall cognitive impairment, memory impairment, medical burden, and disability did not influence the course of geriatric depression (Alexopoulos *et al.*, 2000). The efficacy of antidepressants may not be influenced by overall medical burden (Small *et al.*, 1996). Similarly, the depression of patients with dementing disorders (Nyth *et al.*, 1992; Merriam *et al.*, 1988; Katona *et al.*, 1998) responds to antidepressant drug treatment at rates equal to those of non-neurologically impaired patients. Therefore, broad neurological brain abnormalities do not appear to interfere with antidepressant drug response unless they impair neural systems responsible for executive function.

The above findings suggest that treatment with antidepressant drugs may be insufficient for depressed elderly patients who also have executive dysfunction. Fronto-striato-limbic abnormalities underlying geriatric depression with executive dysfunction may be responsible for its poor or partial response to drug treatment (Alexopoulos *et al.*, 2002a; Kalayam and Alexopoulos, 2003; Alexopoulos *et al.*, 2007). Investigating the efficacy of agents that augment neurotransmitter systems participating in frontostriatal circuitry, e.g. dopamine, acetylcholine and opioids may be an appropriate strategy for helping depressed elderly patients with executive dysfunction.

Depressed patients with executive dysfunction have significant behavioral deficits, including inability to plan, initiate, sequence, and terminate their action when a specific task is complete. Their behavioral deficits, when combined with the hopelessness and resignation of depression, lead to a continuous experience of adversity as little gets done and problems accumulate. Non-pharmacological treatments may be an alternative to novel pharmacological approaches, as their main goal is to improve patients' ability to cope with their environment. A variety of non-pharmacological treatments have been found effective in geriatric depression (Morris and Morris, 1991; Cuijpers *et al.*, 2006; Arean and Alexopoulos, 2007; Miller and Reynolds, 2007; Gum *et al.*, 2007; Lynch *et al.*, 2007; Schulberg *et al.*, 2007). While such treatments may not alter the brain impairment leading to abnormal executive functions, focused non-pharmacological therapies have been effective in the depression of older patients (Niederehe, 1994, 1996). Moreover, the behavioral deficits of patients with depression and executive dysfunction can be addressed with focused psychotherapies. Thus a treatment that imparts problem solving skills may improve depressive symptoms and disability regard-

less of presence, or absence of improvement, in neuropsychological tests of executive functions.

#### *Problem solving therapy*

PST originated from the observation that depressed patients use inadequate or inappropriate approaches in addressing their problems (Nezu and Ronan, 1988). A central premise of PST is that all psychotherapies implicitly help people to become better managers of their daily lives, in effect, to become better at solving problems. Therefore, explicit training in effective problem solving is an efficient method of treating depression. PST itself imparts problem solving skills by teaching patients a structured approach for selecting a problem to address, a method for reviewing potential solutions, and an approach for selecting and implementing the most appropriate solution. Patients are first introduced to the view that depression is either caused or exacerbated by problems the patient is having difficulty solving, since ineffective attempts to solve problems lead to hopelessness and deepening of depression. Successful problem resolution imparts hope, reduces the experience of stress caused by accumulating problems, and ultimately improves depression. After creating a problem list, the patient is taught the problem solving method, which consists of seven steps: problem orientation (how to recognize that a problem exists), problem definition (breaking the problem down into concrete components), goal setting (defining the preferred outcome), solution generation (brainstorming as many solutions as possible to reach the preferred goal), decision making (selecting the most feasible and effective solution), implementation (planning when and how to use the solution), and solution verification (evaluating the effectiveness of the solution). A critical component of PST is behavioral activation; patients are encouraged to balance their problem solving with pleasurable activities. Often in the early phases of PST, more severely depressed patients will use the PST method to develop a plan to engage in pleasant activities. Patients are taught PST in a step-by-step approach over a 5-week period, and then for the remaining 7 weeks of treatment, continue to use the PST method on other problems on their problem list.

We argue that problem solving therapy (PST) is a promising non-pharmacological treatment for depressed elderly patients with executive dysfunction because there is evidence that PST can: (1) treat depressive symptoms; (2) improve behavioral problems of patients with executive dysfunction; and (3)

address specific clinical features of depressed patients with executive dysfunction.

#### *Efficacy of PST in depression*

PST has been found efficacious in the treatment of uncomplicated major depression (Arean *et al.*, 1993). Controlled studies have shown that PST is effective in major depression of younger patients (Nezu, 1986; Nezu and Perri, 1989), medical patients (Mynors-Wallis, 1996; Mynors-Wallis *et al.*, 1997, 2000), and mildly retarded adults (Nezu *et al.*, 1991, 1998). A recent meta-analysis of PST for major depression found that the average effect size for PST in the treatment of depression across populations is 0.83, indicating that when compared to other behavioral interventions, PST is a particularly powerful depression intervention (Cuijpers *et al.*, 2006).

#### *Efficacy of PST in behavioral problems of patients with executive dysfunction*

PST has been found effective in improving initiation and completion of tasks in populations with significant executive dysfunction (Lieberman and Corrigan, 1993; Tarrier *et al.*, 1993; Heinssen *et al.*, 2000). Training in social problem solving skills is a crucial component of rehabilitation for schizophrenic patients, a population with pronounced executive dysfunction (Lieberman and Corrigan, 1993; Heinssen *et al.*, 2000). Programs implementing problem solving treatments improve social adjustment in the community, raise quality of life, and lower relapse rates compared to programs that do not employ this type of skill training (Lieberman and Corrigan, 1993; Liberman, 1994; Liberman *et al.*, 1998; Heinssen *et al.*, 2000; Leclerc *et al.*, 2000). Typically, schizophrenic patients have more severe executive dysfunction than the population of depressed patients with executive dysfunction.

The specific skills taught in PST directly target the behavioral problems of depressed patients with executive dysfunction. Going back to the case of Mrs Q, she reported having trouble getting started on everyday tasks, accomplishing nothing by nighttime. PST addresses problems with initiation by teaching patients strategies to recognize when they should implement the problem solving steps (through problem orientation strategies), and how to implement their chosen solution (using external prompts in the environment to initiate a plan). Mrs Q also reported having difficulty conducting everyday activities, such as shopping, and in her case this problem was related to difficulty in generating and selecting choices. PST

addresses deficits related to generation of alternatives through strategies like brainstorming and fact gathering. Mrs Q reported further problems with making meals and caring for her daily hygiene. This functional deficit was related to difficulties in both decision-making and perseverance. PST addresses these deficits by teaching how to use comparative evaluation, which facilitates planning activities and solutions to everyday problems. Finally, PST teaches patients the requisite steps in planning the implementation of a solution, and results in a written plan with detailed steps on how to implement their solutions. Hence, we expect that PST will be more effective in reducing both depression and disability for patients like Mrs Q than interventions that do not specifically address these behavioral deficits.

#### *Efficacy of PST for specific clinical features of depressed patients with executive dysfunction*

The symptom profile of depressed elderly patients with executive dysfunction is characterized by lack of interest in activities, psychomotor retardation, reduced insight, suspiciousness, a rather mild vegetative syndrome and pronounced disability (Alexopoulos *et al.*, 2002b). PST can improve most of these problems. PST may address lack of interest and psychomotor retardation through behavioral activation, as well as through increased exposure to positive events. As patients become more proficient in managing their lives, their self-esteem may increase. Positive experience with mastering daily problems may instill hope, increase the likelihood of managing problems as they arise, and increase function. PST improves interpersonal sensitivity and has the capacity to reduce suspiciousness by teaching patients to evaluate social situations with available evidence, rather than through assumption (D'Zurilla and Nezu, 1999). As has been shown in schizophrenia studies, developing such skills can improve deficits in communication. A preliminary study has shown that depressed older adults who improved from major depression after receiving PST demonstrated increased problem solving skills and also became more engaged in pleasant activities, had greater life satisfaction, and less disability (Alexopoulos *et al.*, 2003). These observations are similar to those of Thompson *et al.* (1986), who noted that patients who responded to cognitive behavioral therapy (CBT), a technique similar to PST, also reported feeling more energized, having increased enjoyment and engagement in everyday activities, and improved functioning in activities of daily living.

## MODIFYING PST FOR DEPRESSED PATIENTS WITH EXECUTIVE DYSFUNCTION

Although we retained the principles and process of PST, we have modified how therapists teach PST to depressed patients with executive dysfunction in two ways. First, therapists offer more structure and direct assistance than in traditional PST during the first 4–5 weeks of treatment. As treatment progresses and patients improve, therapists become less active in order to foster independent use of the PST method. Second, the teaching of PST is structured in a way that addresses affect regulation, perseveration, and initiation difficulties, common behavioral abnormalities that may interfere with skill acquisition.

Difficulties with affect regulation are common in depressed patients with executive dysfunction. Traditional PST specifies that the focus of PST should only be on problems directly tied to depressive affect (D’Zurilla and Nezu, 1999). However, depressed elderly patients with executive dysfunction and affect regulation problems may become overwhelmed when discussing an emotionally charged situation. This emotional reaction may interrupt the therapeutic process and consume a considerable amount of treatment time, while therapists help patients to contain their affect, rather than teach the PST method. For this reason, in patients with executive dysfunction, treatment starts by focusing on an emotionally neutral problem. As patients master PST, they then apply the model to more emotionally challenging problems.

Perseveration interferes most frequently with the ‘alternative generation’ step of PST because patients have difficulty thinking of unique solutions without prompting. Many patients with this presentation find themselves struggling in the decision making step because they cannot decide between solutions that are essentially a variation on one solution. For this reason, therapists offer solutions and help patients select one of them. As patients are exposed to different methods for reaching their goals, they become more experienced in identifying and selecting solutions for subsequent problems.

Initiation deficits can influence the ‘solution implementation’ step of PST. To overcome this limitation, therapists employ a variety of techniques, including making detailed action plans, calling patients to check their progress, and involving caregivers in the action plan process. Caregiver involvement can be as limited as having patients share their action plan with them and asking for assistance in implementation. It can also be as extensive as including caregivers in treat-

ment, educating them about the PST method, and having them help their severely impaired family members initiate action plans.

## CONCLUSION

The ‘depression executive dysfunction syndrome’ afflicts a considerable number of depressed elderly patients and may be resistant to conventional pharmacotherapy. While the biological dysfunctions contributing to this syndrome may serve as the theoretical basis of novel pharmacological research, the clinical characteristics of depressed patients with executive dysfunction suggest that non-pharmacological approaches targeting their behavioral deficits are efficacious.

We suggest that, among other treatments, PST is a theoretically sound approach to the treatment of the depression-executive dysfunction syndrome of late life. A reason for this assertion is that PST focuses on concrete problems that can be understood by patients with executive dysfunction and trains patients to address them using an easy to comprehend structured approach. Furthermore, PST has been found effective in uncomplicated geriatric major depression and in other psychiatric disorders accompanied by severe executive dysfunction. Finally, PST can address specific clinical features of depressed patients with executive dysfunction, especially when modified to address difficulties with affect regulation, initiation and perseveration.

In a small number of subjects, PST was found more effective than supportive therapy in reducing depressive symptoms and disability in elderly patients with major depression and executive dysfunction (Alexopoulos *et al.*, 2003). A substantial part of the change in depression and disability was explained by the subjects’ improvement in skill generating alternatives and decision making. A larger collaborative study has now concluded, and its results will be available soon. If these initial findings are confirmed, PST may become an important therapeutic option for a large group of depressed elderly patients likely to be drug resistant and to remain depressed and disabled.

## CONFLICT OF INTEREST

None known.

## ACKNOWLEDGEMENTS

This work was supported by P30 MH68638, R01 MH, R01 MH, K23 MH69784, K24 MH074717, R25 MH074500, MH51956, UD2 SM52643, and The Sanchez Foundation.

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