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Stroke Survivors Who Score Below Threshold on Standard Depression Measures May Still Have Negative Cognitions of Concern

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Background and Purpose—There has been an increase in screening for depression in the physically ill. We explored whether important negative cognitions may be missed by conventional approaches to screening for depression in 2 independently conducted stroke studies with similar methods.

Methods—The Auckland Regional Community Stroke (ARCOS) study was a prospective, population-based stroke incidence study conducted in Auckland, New Zealand, for 12 months in 2002 to 2003. The Stroke Outcomes Study was a prospective, hospital cohort study conducted in Leeds and Bradford, United Kingdom, for 33 months in 2002 to 2005. Symptoms of abnormal mood were assessed at 6 months in ARCOS with a single simple question, “Do you often feel sad and depressed?” and the 28-item General Health Questionnaire administered as part of a structured interview and in the Stroke Outcomes Study with the 28-item General Health Questionnaire and a single question about depressed mood taken from the Present State Examination.

Results—Mood data were available at 6 months from 770 ARCOS and 492 Stroke Outcomes Study participants. A significant proportion (up to 28%) of people who did not meet study criteria for depression reported important negative cognitions such as hopelessness, worthlessness, or suicidality. People who were older, dependent in activities of daily living, or not partnered were more likely to report negative cognitions.

Conclusions—Important negative cognitions, including suicidal thoughts, may be missed when people are screened for depression after stroke. Screening alone is not an adequate substitute for a sensitive exploration of the psychological impact of stroke on the survivor. (*Stroke*. 2010;41:478-481.)

Key Words: depression ■ epidemiology ■ psychiatry ■ behavior ■ stroke recovery

Clinicians and researchers are encouraged to screen to detect the substantial proportion of people¹ who will experience depression at some point after stroke. For example, the National Stroke Sentinel Audit² monitors rates of screening for depression during admission after stroke. However, depression is a complex condition that can be conceptualized in different ways, which in turn, govern how it is recognized, diagnosed, and managed.

Most commonly, depression is considered a syndrome. A clinical diagnosis can only be made after a particular constellation of signs and symptoms has been elicited through a semistructured psychiatric interview. For a DSM-IV diagnosis,³ an individual must have experienced 1 of the “core symptoms” of “depressed mood” or “a loss of interest or pleasure” nearly every day, most of the day, in a 2-week period. In addition, the same individual must experience at least 4 additional symptoms of depression, such as changes in

weight or sleep or feeling restless, slowed down, fatigued, or worthless. However, if there is no “depressed mood” or “loss of interest or pleasure,” a diagnosis of depression will not be achieved regardless of how many symptoms are endorsed.

Depression can also be considered an accumulation of depressive symptoms, none of which is privileged in the way that they are in the syndromal approach. These symptoms can be grouped into 4 broad categories. The first consists of affective symptoms such as depression, anxiety, irritability, and apathy, with the second category including behavioral symptoms such as tearfulness, reassurance seeking, inertia, and social withdrawal. These symptoms are listed in most structured questionnaires such as the Centre for Epidemiological Studies Depression Scale⁴ or the Geriatric Depression Scale.⁵ The third category includes somatic symptoms such as insomnia, pains, tension, and weight loss, which have been deliberately removed from some structured questionnaires

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(eg, Hospital Anxiety and Depression Rating Scale⁶) because of a claim that these are also symptoms of physical illness that may then be misattributed to symptoms of depression. The last category consists of important negative cognitive symptoms such as hopelessness, helplessness, and suicidal thoughts. These symptoms are also listed in most structured questionnaires, (eg, the 28-item General Health Questionnaire (GHQ-28)⁷ and the Beck Depression Inventory,⁸) but not all (eg, the Hospital Anxiety and Depression Rating Scale).⁶ The number of symptoms endorsed is counted, and scores above a measure-specific threshold are said to indicate a likely case of depression.

Finally, depression may also be conceptualized as a group of clinically important negative cognitions such as worthlessness or hopelessness that may be present without the traditional “core symptoms” of depressed mood or loss of interest or pleasure, although they often coexist with somatic symptoms. This presentation of so-called depression without sadness⁹ is thought to be more common in the elderly. Although more attention has been given to depression as a risk for mortality in the elderly,^{10–12} there is evidence that specific negative cognitions may be relevant, independent of any associated depressive diagnosis, for mortality^{9,13,14} and subsequent physical and mental morbidity.^{13,15,16}

Screening for depression has been largely oriented toward measuring depressive symptom burden in its own right or as a means of identifying people likely to meet syndrome-based diagnostic criteria. Recently a variety of short screening tools^{17–19} has been developed, the briefest of which involve just 1 or 2 questions that ask respondents directly about the experience of depression. For example, the National Institute for Health and Clinical Excellence in the United Kingdom²⁰ recommends that patients seen in primary care are asked 2 screening questions: “During the last month, have you been feeling down, depressed, or hopeless?” and “During the last month, have you often been bothered by having little interest or pleasure in doing things?” Not all depression screening tools contain negative cognitions for endorsement or only include (as in the Patient Health Questionnaire 2-item²¹) reference to 1 such symptom as part of a composite question.^{6,17–19}

There has been relatively little exploration of which mood-related symptoms are missed when we screen for depression after stroke. We were especially interested in negative cognitions in physical illness, and we therefore examined the relation between these negative cognitions and responses to a single question about depression and to a standardized validated questionnaire in 2 independently conducted (with similar methods) epidemiologic stroke cohorts. Our question was whether using these approaches to identifying depression might lead to neglect of potentially-important negative cognitions in patients who would not meet traditional criteria for a depression diagnosis.

Methods

The Auckland Regional Community Stroke (ARCOS) study has been described elsewhere.²² In brief, ARCOS used a prospective, population-based register to ascertain all cases of acute new or recurrent stroke that occurred among adults in the usually resident population of Auckland during a 12-month period from 2002 to 2003. Each participant was interviewed as soon as possible after stroke. All survivors were reinterviewed at 6 months when depressive symp-

toms were assessed with the Yale question, “Do you often feel sad or depressed?”²³ and symptoms of abnormal mood were assessed in cognitively competent participants (those scoring ≥ 7 on the Hodkinson Mental Test²⁴) with the GHQ-28 (standard 0, 0, 1, 1 scoring).⁷

The Stroke Outcomes Study (SOS2) was a prospective, observational cohort study of the impact of depressive symptoms on outcomes for stroke patients. Patients from 2 large hospitals were recruited after new or recurrent acute stroke, from Trusts in Leeds and Bradford in the United Kingdom, between July 2002 and March 2005.²⁵ The patients were screened with the Mini-Mental State Examination²⁶ and interviewed within 2 to 6 weeks (baseline assessment) after their index stroke episode, depending on their cognitive and physical state. They were interviewed again at 6 months. Participants were asked to complete a range of outcome measures that provided information on functional status and psychological well-being. The measures of mood included the GHQ-28⁷ and the Present State Examination (PSE).²⁷

The GHQ-28 is a broad measure of psychiatric morbidity that includes a subscale for severe depression. The GHQ-28 is probably the most extensively tested scale for reliability, validity, and sensitivity to change across the world.²⁸ Each symptom/question has 4 possible answers: “not at all,” “no more than usual,” “rather more than usual,” and “much more than usual.” Scores range from 0 (the best possible) to 28 (the worst possible) on standard scoring (0,0,1,1).⁷ We used the recommended threshold of >11 to indicate caseness in those with comorbid physical illness.²⁹ A negative cognition or suicidal thought was considered endorsed if a response was other than “not at all” on the GHQ-28 depression subscale.

The PSE consists of standardized questions administered by a trained interviewer and can yield output consistent with the diagnostic criteria of the DSM³ and ICD.³⁰ It includes question 18, “How have you felt in your mood in the past month? Do you keep reasonably cheerful or have you been depressed or low-spirited recently?” which is equivalent to the Yale question.

Depressive symptoms were assessed in ARCOS and SOS2 in cognitively competent participants (no proxy data are reported) who were able to respond for themselves by trained nursing and medical interviewers. The Auckland ethics committee approved the ARCOS study; the Leeds Teaching Hospital Trust and the Bradford Hospitals Trust local research ethics committees approved the SOS2 study, and written, informed consent was obtained from all participants.

Demographic data from ARCOS and SOS2 cohorts and associations between negative cognitions and demographic characteristics were compared by χ^2 or 2-sample *t* tests, where appropriate. To assess the presence of important cognitions in participants who did not answer the single Yale or PSE depression question positively, we present GHQ-28 item responses for those who were positive GHQ-28 cases and those who were not a case on the GHQ-28.

Results

Characteristics of the Study Populations

Complete mood data were available at 6 months from 770 ARCOS and 492 SOS2 participants. The demographic characteristics of the study populations are shown in Table 1. ARCOS and SOS2 participants were similar in age (69 ± 13 years), sex, and marital status. More ARCOS participants were completely independent in activities of daily living, whereas more SOS2 participants were dependent on others for help with activities of daily living and met the criteria for abnormal mood. These differences probably reflect that fact that ARCOS recruited a community sample whereas the majority of SOS2 subjects were recruited in hospital.

Abnormal Mood at 6 Months in the Study Group

Overall, 56 (7%) ARCOS participants and 61 (12%) SOS2 participants met the study criteria for caseness on the GHQ-28 (score >11). Consequently, GHQ-28 mean scores

Table 1. Study Participant Characteristics at Baseline and Depression Characteristics at Follow-Up

	ARCOS Study n=770 n (%)	SOS2 n=492 n (%)	χ^2	P
Female	359 (47)	207 (42)	2.513	NS
Married/partnered	460 (61)	282 (57)	0.728	NS
Functional status				
Bl score=20 (independent)	363 (48)	170 (35)	29.77	<0.0001
Bl score=11 to 19	317 (39)	238 (48)		
Bl score=0 to 10	79 (10)	83 (17)		
Bl score missing	11 (1)	1 (0)		
GHQ-28 case (+)	56 (7)	61 (12)	9.376	<0.01
Yale (ARCOS), PSE (SOS2) case	159 (21)	129 (26)	5.288	ns

Bl indicates Barthel Index score; GHQ-28, 28-item GHQ caseness determined with standard 0, 0, 1, 1 scoring and a threshold score of >11; PSE, positive endorsement of question 18 of the PSE; and Yale, positive endorsement of the Yale question.

(\pm SD) were significantly lower in ARCOS (3.57 ± 4) participants than in SOS2 participants (4.61 ± 6 ; $t=3.39$, $P<0.001$). One hundred fifty-nine (21%, ARCOS) and 129 (26%, SOS2) participants responded positively to the single simple question (see Table 1). Only 40 (5%, ARCOS) and 50 (10%, SOS2) participants met the criteria for caseness on the GHQ-28 and responded positively to the single simple question (see Table 2).

Table 3 shows the proportion of participants who endorsed negative cognitions or suicidal thoughts on the GHQ-28 but did not meet the criteria for caseness on the GHQ-28 (score >11) and answered negatively to the Yale question or question 18 of the PSE. A significant proportion (up to 28%) of people who did not meet study criteria for depression on 1 or more measures reported important negative cognitions, such as hopelessness, worthlessness, or suicidality. Being older was associated ($P<0.05$) with thoughts of being worthless, that life was hopeless or not worth living, or wishing themselves dead for ARCOS and SOS2 participants. Being dependent in activities of daily living was associated with feeling that life was hopeless or not worth living (ARCOS) and wishing themselves dead and away from it all (ARCOS and SOS2). Not being married or partnered was associated

Table 2. Proportion of Study Participants Meeting Caseness Criteria as Determined by the GHQ-28 (Score >11), According to Endorsement of the Yale Question or Question 18 of the PSE About Depressed Mood

	ARCOS Study n=770		SOS2 n=492	
	Yale+ n (%)	Yale- n (%)	PSE+ n (%)	PSE- n (%)
GHQ-28+	40 (5)	16 (2)	50 (10)	11 (2)
GHQ-28-	119 (16)	595 (77)	79 (16)	352 (72)

+ Indicates meeting criteria for caseness; and -, not meeting criteria for caseness. Other abbreviations are as defined in the footnote to Table 1.

Table 3. Proportion of Study Participants Endorsing Negative Cognitions or Suicidal Thoughts Who Did Not Meet the Study Criteria for Caseness on the GHQ-28 (Score >11) and Did Not Positively Endorse the Yale Question or Question 18 of the PSE About Depressed Mood

GHQ-28 Depression Subscale Questions	ARCOS Study n=730* n (%)	SOS2 n=442† n (%)
<i>Negative cognitions</i>		
Been thinking of yourself as a worthless person	177 (24)	122 (28)
Felt that life is entirely hopeless	113 (15)	102 (23)
Found at times you couldn't do anything because your nerves were too bad?	60 (8)	62 (14)
<i>Suicidal thoughts</i>		
Felt that life isn't worth living?	89 (12)	74 (17)
Thought of the possibility that you might do away with yourself?	52 (7)	46 (10)
Found yourself wishing you were dead and away from it all?	77 (11)	64 (14)
Found that the idea of taking your own life kept coming into your head?	42 (6)	45 (10)

*Total of 770 participants, minus 40 participants scoring as a case on the GHQ-28 and the Yale question.

†Total of 492 participants, minus 50 participants scoring as a case on the GHQ-28 and the Yale question.

with thoughts of being worthless, hopeless, and nerves being bad (SOS2) or life wasn't worth living or wishing themselves dead (ARCOS; data not presented).

Discussion

These 2 independently conducted stroke studies have demonstrated that a significant proportion (up to 28%) of patients with negative cognitions including suicidal thoughts may be missed by researchers and clinicians who rely on screening methods such as a single question or a standardized self-report measure, alone or in combination, to detect depressive illness. Symptoms listed in the GHQ-28 depression subscale are important in their own right, because they are markers of significant distress, even in those who do not have sufficient other symptoms to warrant a psychiatric diagnosis.

We suggest that clinicians and patients will benefit from reviewing responses to individual questions on mood rating scales together, regardless of whether scores are below a prespecified cutpoint or whether people screen positive or negative for depression on a single question. Reviewing individual item responses may provide the opportunity for frank but sensitive discussions between clinician and patients about endorsed negative cognitions, including suicidal thoughts. This process may also facilitate establishment of a "watchful waiting" period, as recommended in the National Institute for Health and Clinical Excellence guidelines³¹ to prevent unnecessary treatment of mild symptoms of abnormal mood that may resolve with no intervention.

A strength of our data is the consistency of the phenomenon in 2 different studies that used similar screening questions but different methods of assessment. Both studies made strenuous efforts to avoid bias in sampling and follow-up, and

a standardized assessment of mood in participants with stroke was used (GHQ-28⁷), which is an established measure for assessing depressive symptoms after stroke,^{32,33} although this was interviewer administered in one study (ARCOS) and self-completed in the other (SOS2). It should also be noted that these were post hoc analyses. As a result, we have been unable to reinterview participants to explore further the meaning of negative cognitions in those who answered questions about depressed mood negatively.

The likelihood of experiencing depression after stroke is high,¹ and many patients do not seek help for or even recognize abnormal mood symptoms of clinical concern.³⁴ Screening for depression is therefore desirable, but our conclusion is that alone it is not likely to be an adequate substitute for a sensitive exploration of the psychological impact of severe disease on the survivor. Clinically, a single question about depression, or a high score on a depression questionnaire, may be useful and is certainly better than asking nothing, but it is unlikely to elicit important information about certain aspects of the patient's mental state, such as a sense of worthlessness or hopelessness or thoughts that life is not worth living. We need more research to understand the origins of these cognitions and their impact on outcomes.

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Disclosures

None.

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