Depression Status Is Associated with Functional Decline Over 1-Year Following Acute Stroke

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Background: We investigated the independent association of depression status at 3 and 12 months after stroke and functional decline. Methods: Data were obtained as part of the multicenter Adherence eValuation After Ischemic stroke Longitudinal (AVAIL) registry. Depression was assessed with the Patient Health Questionnaire-8 (depression, PHQ-8 ≥ 10), and functional status was assessed with the modified Rankin score (mRS) at 3 and 12 months following hospitalization for ischemic stroke. We used logistic regression analyses to evaluate the independent association between the change in depression rating and the change in mRS. Results: Among 1444 patients, 75% did not have depression at either time point, 9.2% had persistent depression, 8.7% had resolving depression, and 7% had incident depression at 12 months. After covariate adjustment, depression status at 3 and 12 months remained associated with worsening mRS (P = .01). Compared with patients without depression, those with resolving depression were less likely to have a worsening mRS (odds ratio [OR] = .49, 95% confidence interval [CI]: .29-0.83). There was no difference in functional decline between those with no depression and those with persistent depression; however, those with persistent depression had worse mRS at both time points (median mRS: 2.5 [Q1-Q3: 2-3] at 3 months; 2 [2-3] at 12 months) than those with no depression (mRS: 1 [0-2] at both 3 and 12 months), P < .0001. Conclusions: Patients with resolving depression in the first year after stroke were less likely to have functional deterioration than those without depression. Greater functional impairment was present in the setting of depression. Key Words: Depression after stroke—functional recovery—stroke—functional decline.

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Introduction

Stroke can cause acute loss of functional independence and may be associated with progressive functional loss for up to 5 years. The annual increase in disability before stroke more than triples after stroke. Even after excluding patients with recurrent clinical stroke, there is a steeper decline in functional status after an ischemic stroke compared with before stroke. The duration of depression also varies, with up to half of those with depression recovering and a smaller percentage having persistent or new-onset depression within the first year. Studies evaluating the impact of depression on post-stroke functional outcome are inconsistent, in part due to heterogeneity in study designs. Several reports find both an association between depression and a functional status measured at the same time point, and between baseline depression and subsequent functional outcome, but it remains unclear whether changes in post-stroke depression influence functional decline.

Understanding whether post-stroke depression contributes to functional decline, beyond its known association with functional outcome, may identify additional targets in the care of patients with stroke experiencing functional decline in the first year post stroke. In the current study, we hypothesized that the changes in depression in the first year after stroke were associated with functional decline. We specifically aimed to compare the effects of resolving and incident depression with persistent or no depression.

Methods

Study Population and Design

This is a secondary analysis of a multicenter prospective cohort registry (Adherence eValuation After Ischemic stroke Longitudinal [AVAIL] study), which was designed to assess adherence to stroke prevention medications from hospital discharge to 1 year in patients admitted with stroke or transient ischemic attack (TIA). The AVAIL study methodology has been published. Our study included only patients with stroke and excluded patients with TIA. Briefly, 2492 patients with stroke were recruited from hospitals participating in the Get With The Guidelines (GWTG–Stroke program from July 2006 to July 2008. The 12-month follow-up was completed in August 2009. Outcome Sciences, Inc., served as the data collection and coordinating center for GWTG–Stroke. The Duke Clinical Research Institute served as the data analysis center for both GWTG and AVAIL. Each participating site obtained institutional review board approval before enrolling patients into AVAIL. The Strengthening the Reporting of Observational Studies in Epidemiology statement was followed for reporting this study.

Subject Recruitment

The inclusion criteria for this study were age 18 years or older; hospitalization for a primary diagnosis of acute ischemic stroke based on the GWTG–Stroke International Classification of Diseases, Ninth Edition Codes; direct admission based on physician evaluation or arrival through the emergency department; patient or legally authorized representative consent to participate; and patient inclusion in the GWTG–Stroke program. Subjects were excluded from the present analysis if baseline data were missing or if the Patient Health Questionnaire-8 (PHQ-8), antidepressant drug dose, or modified Rankin score (mRS) were missing at the 3-month or 12-month follow-up (Fig 1). Subjects were contacted by telephone by research personnel at the Duke Clinical Research Institute at 3 months and 12 months after hospital discharge. Centralized interviewers used standardized scripts for follow-up.

Outcomes and Covariates

Depression was assessed prospectively with a self-reported depressive symptoms scale (PHQ-8) at both 3 months and 12 months following hospitalization.

The PHQ-8, based on symptoms within the previous 2 weeks, includes 8 of the 9 criteria from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, for diagnosis of major depressive disorder. The PHQ-8 yields a score from 0 to 24, with a score of ≥10 indicating a clinically significant depressive disorder. This cutoff has a sensitivity and specificity of 88% and positive predictive value of 57% for major depression. The PHQ-8 performance as a depression screening tool is comparable.
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