Journal of Affective Disorders 208 (2017) 338–344

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Risk factors for late-life depression and correlates of antidepressant use in Costa Rica: Results from a nationally-representative longitudinal survey of older adults

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ABSTRACT

Background: Risk factors for late-life depression have been studied in high-income countries, but there have been no longitudinal studies from middle-income countries. This study reports risk factors for late-life depression and correlates of antidepressant using the Costa Rican Longevity and Healthy Aging Study (CRELES), a nationally representative cohort of adults age 60 and over.

Methods: CRELES contains baseline interviews in 2005 (n=2827) with follow-up interviews in 2007 and 2009. CRELES used the Geriatric Depression Scale Short Form to identify depression using cut-offs for mild and severe depression and contained a 14-question assessment to determine physical disability. Participants self-reported antidepressant use and chronic health conditions. We examined correlates of newly screened depression and new antidepressant use among participants not depressed or not using antidepressants in the previous study wave. We used generalized estimating equations to estimate the association among variables.

Results: Increases in disability were associated with newly screening for mild and severe depression. New medical conditions and recent widowhood were associated with newly screening for severe depression. Recent widowhood was also associated with new use of antidepressant medication.

Limitations: Limitations of this study include absence of persons living in institutions, inconsistency of screening tools with clinical diagnoses, and possible effects of stigma and recall bias on screening.

Conclusions: Risk factors for late-life depression in Costa Rica are similar to risk factors in high-income countries. Patterns of antidepressant use suggest providers may recognize the role of bereavement as a risk factor for late-life depression but not of disability or chronic conditions.

1. Introduction

Major depressive disorder is the second leading cause of years lived with disability in both high-income and low- or middle-income countries. (Vos et al., 2012). Depressive symptoms in older individuals are associated with poor quality of life, worsening of chronic conditions, and increased mortality (Beekman et al., 1999; Djernes, 2006; Katon, 2003; Kohn and Epstein-Lubow, 2006). The prevalence and risk factors of depressive symptoms in older adults have been studied in several prospective cohort studies performed in high income countries, which have in turn been subjected to systematic review and quantitative meta-analysis (Beekman et al., 1999; Cole and Dendukuri, 2003; Djernes, 2006). A quantitative meta-analysis of prospective cohort studies with the aim of identifying risk factors for late-life depression identified six studies meeting strict inclusion criteria, all from high income countries, and evaluated 13 possible risk factors (Cole and Dendukuri, 2003). The study found five statistically significant risk factors for late-life depression: bereavement, sleep disturbance, physical disability, prior depression, and female gender. Poor health status, living alone, and developing a new medical illness represented uncertain risks, pointing to the need for more research.

Cross-sectional studies in low and middle-income countries have generally found rates of depressive syndromes and symptoms that are similar to or higher than those found in high income countries (Alvarado et al., 2007; Costa et al., 2007; Domino et al., 2014; Guerra et al., 2016, 2009; Gureje et al., 2007; Instituto Especializado de Salud Mental, 2002). These studies have also identified correlates of late-life depression in cross-sectional analysis, including physical

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http://dx.doi.org/10.1016/j.jad.2016.08.063
Received 16 June 2016; Received in revised form 15 August 2016; Accepted 16 August 2016
Available online 11 October 2016

disability, past history of depression, perception of income, and childhood hunger (Alvarado et al., 2007; Guerra et al., 2009). One community-based study of older Brazilians employed a prospective design to identify time-invariant risk factors for episodes of clinically significant depression, including diabetes and cognitive impairment (Do Nascimento et al., 2015). Nevertheless, there have thus far been no studies of longitudinal risk factors and prevalence of late-life depression in middle-income settings to help elucidate the possible relationship between disability and depression. Similarly, the association of new chronic health conditions with new incidences of depression remains uncertain in high and middle-income settings. There is similarly little data on utilization of antidepressant medication for the treatment of late-life depression in middle-income settings, though previous studies show low self-reported treatment rates (Guerra et al., 2009).

Costa Rica is of particular interest for the study of late-life depression because of its high overall life expectancy, which has been linked to its social investments (Rosero-bixby et al., 2015). Government health insurance covering 90% of the population pays full costs for most outpatient and inpatient care at public facilities, though private services are also available for out-of-pocket payment. Using data from the Costa Rican Longevity and Healthy Aging Study (CRELES), a nationally representative prospective cohort study of adults age 60 and over, our objective was to determine whether risk factors and correlates from previous studies represent risk factors for late-life depression in Costa Rica.

2. Methods

CRELES is a nationally representative, probabilistic sample of non-institutionalized adults aged 60 and over in Costa Rica (Rosero-Bixby and Dow, 2009). Study organizers conducted baseline interviews in 2005 (n=2827) with 2-year follow-up interviews in 2007 and 2009. Interviewers used proxy respondents when interviewers found respondents had serious communication problems or if respondents failed a cognitive evaluation. Proxy respondents did not participate in depression screening, so we excluded individuals who responded with proxies from analyses. These individuals were excluded only in the waves in which they responded with proxies. Of the 2827 initial participants, 2223 (79%) responded without a proxy in at least one wave.

2.1. Measures

Study organizers used the 15-item Geriatric Depression Scale Short Form (GDS) to identify current symptoms of depression (Yesavage et al., 1983; Yesavage and Sheikh, 1986). In accordance with a prior validation analysis, we utilized thresholds of 6 to indicate probable mild depression, and 11 to indicate probable severe depression (Almeida and Almeida, 1999), The mild depression measure includes, then, those with probable severe depression.

Participants self-reported medication use or brought in prescription medication bottles during the interviews, allowing for determination of antidepressant use. Survey teams coded medication names into drug classes, so respondents did not need to recognize medications as antidepressants. During the first wave of the study, participants reported on whether a healthcare provider had ever told them they had a psychiatric condition. Participants being successfully treated for depression using antidepressants may not screen positively for depressive symptoms using the GDS. In order to capture all participants with treated and untreated depression, we include the compound variable mild depression or antidepressant use in our analyses, in addition to considering these separately.

Participants responded to questions regarding 14 activities of daily living and instrumental activities of daily living. Even though many studies distinguish basic, instrumental, and functional disabilities, CRELES combines all these dimensions in a single indicator, since the Cronbach's alpha was .92 for the 14 scale items (Rosero-Bixby and Dow, 2009). The disability scores are standardized on a 100-point scale, with greater values indicating higher levels of disability.

Participants reported on whether a healthcare provider had ever told them they had one of the following chronic health conditions: pulmonary disease, heart disease, cancer, stroke, heart attack, diabetes, arthritis, or osteoporosis.

Income is measured as total income of interviewees in tens of thousands of colones as reported by interviewees. Study organizers measured household assets as an index from 0 to 10, based on factors such as fuel used for cooking, potable indoor water, presence of a computer, and others. Interviewees also reported on their highest grade achieved, marital status, and household composition.

2.2. Statistical analysis

We computed weighted average point prevalence and weighted period prevalence of depression and antidepressant use by sex and psychiatric history. Average point prevalence represents the average of the prevalences of the three waves. Period prevalence represents the prevalence of depression or antidepressant use for the entire sample at any time during the six-year study period. Prevalence is weighted and standard errors are presented.

We performed univariate comparisons of measured factors between participants based on frequency of depressive symptoms using chi-squared tests. We used generalized estimating equations (GEE) to model the associations between the repeated measures across three waves of depression and covariates disability, health status, socio-economic status, and demographic characteristics. In longitudinal analysis, we considered the onset of new depression at wave 2 among individuals not depressed at wave 1 stacked with new depression at wave 3 among individuals not depressed at wave 2. We used GEE to examine the association between these longitudinal outcomes and changes in disability, new medical illnesses, income, goods, and widowhood between each set of adjacent waves. For GEE results we report average marginal effects with delta method standard errors.

3. Results

Table 1 presents characteristics of the full sample overall and by frequency of positive screens for mild depression, as well as univariate chi-squared analyses for differences across frequency groups. Univariate chi-squared analysis between groups based on frequency of positive screens for mild depression found all variables to be significantly different between groups with the exception of living alone. Approximately one third of the sample reported no chronic conditions, one third reported one chronic condition, and one third reported two or more chronic conditions in the latest wave for which a response was available. Nearly half of respondents scored a disability level below 10 on a standardized 100-point scale. Slightly more than half reported a history of childhood poverty, and approximately one in six reported a history of psychiatric illness at the start of the survey.

Table 2 presents weighted average point prevalence and weighted period prevalence of depression and antidepressant use by sex and psychiatric history. Weighted average point prevalence for screened depression and antidepressant use was higher among women than men, with rates of severe depression and antidepressant use twice as high among women compared to men. Participants who indicated a history of psychiatric illness at the start of the study experienced average point prevalence of depression and antidepressant use that were approximately 2–3 times higher than those with no history of psychiatric illness. Period prevalence was approximately 1.5–2 times greater than the corresponding average point prevalence. Patterns of period prevalence mirrored those of average point prevalence, with higher rates among women and highest rates among those with a self-reported psychiatric history. Among participants with a self-reported