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Healthcare Use Among Older Primary Care Patients With Minor Depression

Yolonda R. Pickett, MD, MS[1,2], **Samiran Ghosh, PhD**[1], **Anne Rohs, MD**[2], **Gary J. Kennedy, MD**[2], **Martha L. Bruce, PhD, MPH**[1], and **Jeffrey M. Lyness, MD**[3]

[1]Department of Psychiatry, Weill Cornell Medical College

[2]Department of Psychiatry and Behavioral Sciences, Montefiore Medical Center, Albert Einstein College of Medicine

[3]Department of Psychiatry, University of Rochester Medical Center.

Abstract

OBJECTIVE—To determine the rate of healthcare utilization for older primary care patients by depression status.

DESIGN—Cross-sectional data analysis.

SETTING—Primary care practices, western New York state.

PARTICIPANTS—748 patients aged 65 years and older.

MEASURES—Diagnostic depression categories were determined using the Structured Clinical Interview for DSM-IV (SCID). The Cornell Services Index (CSI) measured outpatient medical visits. Demographic, clinical, and functional variables were obtained from medical records and interview data.

RESULTS—41.3% had M/SSD and 53.2% had no depression. The unadjusted mean number of outpatient medical visits was greater in those with M/SSD (3.96 visits within 3 months) compared to those without depression (2.84), with a significant difference after adjusting for demographic functional, and clinical factors.

CONCLUSION—Those with M/SSD had higher rates of healthcare utilization compared to those without depressive symptoms. Future research should examine whether interventions for older adults with M/SSD reduce healthcare utilization.

Keywords

geriatric; minor depression; healthcare utilization

OBJECTIVE

While uncertainty remains about the best way to categorize various depressive disorders, there is growing consensus for a spectrum model. At the severe end lies major depressive disorder (MDD), with subsyndromal or minor depression (M/SSD) at the milder end. Few

Corresponding Author: Yolonda R. Pickett, MD, MS. 21 Bloomingdale Road, White Plains, NY 10605; 347-920-0112 (phone); 914-682-6979 (fax); yop2003@med.cornell.edu.

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studies have characterized the healthcare utilization of older primary care patients with M/SSD. One observed increased utilization in congestive heart failure patients, but attributed increases to health problem severity [1]; while another reported increases, but found differences less compelling when adjusting for other relevant covariates[2]. The current data are from a heterogeneous sample of older primary care patients characterized with M/SSD using well defined criteria. The objective was to test the hypothesis of a higher rate of healthcare utilization for those with M/SSD compared to those without depression.

METHODS

Participants and Procedures

This is a cross-sectional analysis of data collected during a prospective cohort study of older primary care patients[3] whose purpose was to describe the outcomes and characterize the predictors of late-life depressive disorders. Individuals aged 65 years and older who presented to primary care practices on designated days were eligible and approached for enrollment. In order to participate, subjects were required to give written informed consent in English and a face-to-face intake interview administered by a trained rater. Approval for the study was obtained by the University of Rochester Research Subjects Review Board, the Montefiore Medical Center Internal Review Board, and the Weill Cornell Medical College Internal Review Board.

Measures

The diagnostic categories of depressive illness were determined using the Structured Clinical Interview for Diagnostic and Statistical Manual-IV (SCID)[4]. MDD was defined as the presence of depressed mood or anhedonia in addition to at least four other depressive symptoms for at least two weeks. M/SSD was defined as in the original study[3] as (1) minor depression (depressed mood or anhedonia with at least one but no more than three additional depressive symptoms for at least two weeks); (2) dysthymia (depressed mood at least two years); or (3) subsyndromal depression (a minimum of two depressive symptoms at either ‘subthreshold’ or ‘threshold’ levels by SCID criteria, with at least one being depressed mood or anhedonia, yet not meeting criteria for MDD, minor depression, or dysthymia). All others were “nondepressed.” The 24-item Hamilton Rating Scale for Depression (Ham-D) measured depressive symptom severity[5].

Healthcare utilization was determined using the Cornell Services Index (CSI), a standardized measure of the quantity and characteristics of services used[6]. The CSI is a 12-item self-report questionnaire that records the frequency and duration of services in different healthcare settings for the previous 90-day period. The Cumulative Illness Rating Scale (CIRS), completed by the physician-investigator (JML), assessed medical illness burden[7]. The Instrumental Activities of Daily Living (IADL)[8] measured higher-order activities of daily living, such as financial management, shopping, and meal preparation. The Mini-Mental Status Examination (MMSE) determined cognitive functioning[9]. Demographic information was obtained from patient report and review of the medical record.

Data Analysis

The data used for these analyses were collected from the entire sample at baseline. Descriptive statistics were presented as relative frequencies for categorical variables, and means and standard deviations for continuous variables. Differences between depression categories for all covariates were tested using chi-square tests if assumptions were met or Fisher's Exact tests otherwise. Continuous variables were tested using ANOVA. Missing data from the dependent variables were corrected by multiple imputation procedure, a standard statistical technique in which each missing value is replaced multiple times thus

producing a valid statistical inference under Missing at Random assumption[10]. Almost 70% of the observations had one or missing covariates, while all of the covariates considered had at least one missing value. The missing data patterns were not monotone and we therefore used MCMC option of SAS Proc MI (SAS Procedure Guide, 8th Edition, Cary, NC, 1999). Since Proc MI uses joint normal model, each covariates first tested for normality and then transformed via Box-Cox transformation if departure from normality is significant.

Since the dependent variable for the study (number of outpatient visits) was a count variable, a generalized linear model is used for the data analysis. There were several models available but we chose the Negative Binomial regression model with the log likelihood function because of its fit for the data and ease of interpretation. MDD was included in the regression for descriptive purposes but was not the main focus of these analyses and therefore will not be discussed in detail. All demographic and clinical variables were included in the final model as is custom with Negative Binomial regression. All statistical analyses were performed using SAS statistical software (SAS, 1999).

RESULTS

Of the 756 consented individuals, 748 had baseline data. Descriptive statistics were performed prior to imputation. The average age for the sample was 75.12 (6.86) years, 63.44% were female, 91.80% were Caucasian, and 0.54% Hispanic. The average years of education obtained were 14.11 (4.10), and 51.21% were married and living with their spouse.

Depression rates were 5.5% with MDD, 41.3% with M/SSD, and 53.2% without depressive symptoms. Among those with M/SSD, a significantly greater proportion were female, had greater depression severity, more medical burden, and greater IADL impairment. There were no significant differences among depression categories in age, race, ethnicity, education, marital status, or MMSE.

The differences in the unadjusted means of the outpatient visits for M/SSD (3.96) and nondepressed (2.84) were not statistically significant among the depression groups. Those with M/SSD had fewer inpatient days, greater skilled nursing facility days, greater mental health visits, and more home healthcare visits. Emergency department visits were minimal for each group, and neither reported substance abuse treatment.

After multiple imputation, the negative binomial regression model determined differences in outpatient visits among the depression diagnostic groups, using nondepressed as a reference, while controlling for the significant effects ($p<0.05$) of age, marital status, and medical illness burden (Table 1). Gender, race, ethnicity, education, HAM-D, IADL score, and MMSE showed no significant effect. In this model, the estimate (0.181) is the log count of number of outpatient visits, so the expected difference in the number of visits over the 90 day period while keeping all other covariates constant is 1.20 more visits for those with M/SSD compared to the nondepressed.

CONCLUSION

These results confirmed our hypothesis of a higher rate of healthcare utilization for older primary care patients with M/SSD compared to the nondepressed. The amount of individuals in this study categorized with M/SSD was 41%. If this same proportion of a given population had similar increases in physicians' visits, this change would represent a meaningful increase in utilization of services within that population. Also, if these effects were additive over time, the increase of one visit per person every 3 months would have a significant impact on the healthcare system over the course of years.

These findings are consistent with other studies of older adults with milder forms of depression[1,2]. The increase in healthcare in those with M/SSD may be associated with the increases in disabilities and morbidity from other comorbid conditions, making it difficult for providers to distinguish depressive symptoms from medical symptoms in these patients, especially if the patient's chief complaint is a physical symptom. For these reasons, providers must have a higher level of suspicion in screening for M/SSD.

We observed increasingly higher scores with the CSI as the severity of depression increased. A potential limitation of the CSI is that it is a self-report measure which could leave the data vulnerable to recall bias. However, this rating scale was designed to reduce this bias by reducing the reporting time frame from 6 months (as seen in other epidemiological studies) to 3 months to improve the accuracy of the data given[6]. Another limitation of this study was a sample that was 90% Caucasian, making it difficult to determine the impact of race on the categorization of depressive groups or clinical outcomes. The proportion of those categorized as M/SSD depression may be higher than expected, however the ratio of major depression to minor depression found here (1:8) was consistent with other studies of late-life depression in primary care settings[3]. We also found that greater than 10% of the dependent variable (outpatient visits at baseline) was missing, which is why we chose multiple imputation. This is a simulation-based approach that results in a final model that contains all response and predictor variables and any interactions of interest in the analysis model used. This method can add information that helps to satisfy the missing at random assumption and can increase the precision of the imputed values[10].

The increase in healthcare utilization was greater in those with M/SSD and if consistent over time, the difference in utilization could have a substantial impact on the healthcare system. Interventions designed at improving the symptoms of M/SSD may also effectively decrease healthcare utilization, thereby reducing costs. Future research should be directed at observing the prospective pattern of utilization in this population and designing interventions which could reduce their burden of increased service utilization on the healthcare system.

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Table 1

Negative Binomial Regression Model, Estimation and Tests of Fixed Effects

Variables at baseline	Increase in Healthcare Visits	Estimate	Standard Deviation	p-value
Depression diagnosis1 (Compare no depression to M/SSD)	1.20	0.181	0.117	**0.019**
Depression diagnosis2 (Compare no depression to MDD)	1.10	0.091	0.708	0.514
Age	1.02	0.017	0.022	**0.002**
Gender	0.90	-0.11	0.312	0.197
Race	0.94	-0.061	0.447	0.204
Hispanic	0.93	-0.072	0.289	0.284
Marital Status	0.96	-0.041	0.126	**0.030**
Education	1.00	0.002	0.903	0.639
CIRS	1.04	0.039	0.074	**0.010**
Ham-D	1.01	0.012	0.230	0.130
IADL	1.00	-0.005	0.986	0.533
MMSE	1.01	0.006	0.779	0.476
Intercept		-0.115	0.917	0.539

M/SSD: Minor or Subsyndromal Depression

MDD: Major Depressive Disorder

CIRS: Cumulative Illness Rating Scale

Ham-D: Hamilton Rating Scale for Depression

IADL: Instrumental Activities of Daily Living

MMSE: Mini Mental Status Examination