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Antidepressant Medication Use Among Patients with Depression: Comparison between Usual Care and Collaborative Care Using Care Managers

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Abstract: Depression poses a significant economic and health burden, yet it remains underdiagnosed and inadequately treated. The STAR*D trial funded by the National Institute of Mental Health showed that more than one antidepressant medication is often necessary to achieve disease remission among patients seen in both psychiatric and primary care settings. The collaborative care model (CCM), using care managers, has been shown to be effective in numerous studies in achieving sustained outcomes in depression management compared to usual care. This model was adopted in a statewide depression treatment improvement initiative among primary care clinics in Minnesota, which was launched in March 2008. In this study, records of patients who were enrolled in CCM from March 2008 until March 2009 were reviewed and compared to those under usual care. Patients who were followed under the CCM had a significantly greater number of antidepressant medication utilizations when compared to those under usual care. After 6 months, mean PHQ-9 score of patients under CCM was statistically lower than those in usual care. There was no significant difference in both mean PHQ-9 scores at 6 months and antidepressant utilization between the 2 groups among patients aged 65 years and older.

Keywords: Collaborative care, depression, medications, management, utilization.

INTRODUCTION

Depression is responsible for an estimated economic cost of more than $40 billion annually and has a large impact on quality of life and productivity [1]. It has been ranked as the leading cause of disability and premature death among people aged 18-44 years worldwide and is expected to be the second leading cause of disability for people of all ages by 2020 [2, 3]. Yet it remains underdiagnosed and inadequately treated. Only 46%-57% of patients are diagnosed and treated, and only 18%-25% receive adequate therapy [4, 5]. There is poor adherence among patients who have been prescribed an antidepressant medication; approximately 68% fail to fill their medications based on pharmacy dispensing data [6]. Furthermore, the Sequenced Treatment Alternatives to Relieve Depression (STAR*D) trial confirmed that several sequential treatment steps are often needed to obtain remission, and when more treatment steps are required, remission rates decline [7]. Only 28%-33% of patients, using the Hamilton Rating Scale for Depression and the Quick Inventory of Depressive Symptomatology-Self-Report respectively, remitted after 12 weeks of adequate trial on a single agent; switching to another agent or augmentation

with a second agent was often necessary [8]. The study was not conducted using a collaborative care model (CCM).

The CCM, using care managers, has consistently been demonstrated in numerous studies to be an effective way to manage depression and achieve sustained outcomes compared to usual care [9]. The IMPACT program which used this model also showed its association with high probability of lower healthcare costs in a four year period [10]. In 2008, the Minnesota Institute for Clinical Systems Improvement (ICSI) launched a statewide program using the CCM aimed at improving depression care delivery in primary care settings throughout the state. The Depression Improvement Across Minnesota Onward to New Direction (DIAMOND) consists of key elements that include a systematic way of screening for depression and tracking treatment response by using the Patient Health Questionnaire-9 (PHQ-9), use of care managers working collaboratively with primary care physicians, use of a psychiatrist consultant who provides supervision to the care managers and makes recommendations to primary care providers, and inclusion of a registry. The initiative chose to adopt the PHQ-9, a well-validated tool that can be used both to screen for depression and track treatment response in primary care practices [11, 12].

In March 2008 as part of the ICSI initiative, the DIAMOND model was implemented at Mayo Family Northwest Clinic in Rochester, Minnesota. Patients aged 18 and above with a PHQ-9 score of 10 or higher were eligible for enrollment in the program by their primary care providers. The

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Table 1. Baseline and Six-Month Mean PHQ-9 Scores Among Patients in CCM and Usual Care

Variable	Overall		Diamond		Usual Care		P
	(N=333)		(N=242)		(N=91)		
Eligible PHQ	15.13	± 3.93	15.12	± 3.91	15.14	± 4.01	0.97
FU6M_PHQ_Score	4.84	± 4.63	4.44	± 4.13	7.13	± 6.44	0.002
PHQ-9 Difference	-10.36	± 5.60	-10.68	± 5.49	-8.59	± 6.00	0.05

care manager additionally administered the Mood Disorder Screening (MDS), GAD7 and AUDIT screening tools at the time of enrollment. Those who scored positive in MDS were excluded and were referred directly to a psychiatrist. Eligible patients who chose to participate were then followed by care managers under the supervision of a psychiatrist who provided consultative recommendations to the primary care providers. Details of this project have been described previously [13]. The model was subsequently adopted at a second Mayo site in September 2008 and rolled out to the remaining primary care sites in March 2010.

This study compared the pattern of antidepressant medication utilization between eligible patients who were managed under the CCM, using care managers, and those meeting criteria for DIAMOND but were managed under usual care. We hypothesized that the utilization of antidepressant medications among patients with depression managed under the CCM would be different from usual care; those in CCM would be more likely to remain on medications or have changes in medications than those in usual care.

METHODS

From March 2008 until March 2009, data were abstracted from medical records of patients who received a diagnosis of depression defined as a screening score of 10 or greater on the PHQ-9, had given permission to have their records reviewed, and had at least a 6-month follow-up. Medication utilization data were extracted from clinical notes (Medication list/Admission medications) within 2 days of the index date, defined as date of diagnosis, and 6 months after the index date. Abstraction was done using SAS version (SAS Institute Inc., Cary, NC) which was programmed to connect to the clinical notes. Data was matched with the DIAMOND registry and the pattern of antidepressant medication utilization among patients with depression enrolled in the CCM was compared to those under usual care. Demographic data were also obtained. Data were analyzed using the Fisher exact test. Subanalysis was done on geriatric patients defined as those aged 65 years and older. The study was approved by the Mayo Clinic Institutional Review Board.

RESULTS

There were 333 patients who met study criteria; of those patients, 242 were enrolled under CCM and 91 were enrolled in usual care. The mean age of patients was 39 years with 75% being women, 90% Caucasian and over 50% married. The initial PHQ-9 score in both groups was 15. Thirty five percent (N=118) had a diagnosis of recurrent depression. There was no statistical difference in demographics (age,

gender, race, ethnicity, marital status, comorbidity, initial PHQ-9 score) between the two groups. Fifty percent (N=121) of patients enrolled in CCM had been on an antidepressant medication prior to enrollment; citalopram was the most commonly prescribed agent. At 6 months, the mean PHQ-9 score of those enrolled in CCM was statistically lower compared to those in usual care (4.44 vs. 7.13; $P = 0.002$). Likewise the mean difference in PHQ-9 score from baseline was also greater among those in CCM compared to usual care (Table **1**).

Those patients who were followed under CCM had significantly greater utilization of antidepressant medications at the end of 6 months ($P < 0.001$). They likewise had more change in the number of medications from the index point or at the time of CCM enrollment to 6 months ($P = 0.006$) as well as from pre-CCM enrollment to 6 months post enrollment ($P < 0.001$). More patients were switched to a different antidepressant medication at the time of CCM enrollment compared to usual care but the number is not statistically significant (Table **2**). At 6 months, one-third of the patients in both CCM and usual care were on citalopram; sertraline and bupropion were the two other most commonly used medications.

A subset analysis of patients aged 65 years and older (N=35) showed no statistically significant difference in mean PHQ-9 score at 6 months ($P = 0.59$) and antidepressant medication utilization ($P = 0.29$).

DISCUSSION

The CCM has been shown in various studies and systematic reviews to be consistently effective in depression management, both in achieving and maintaining remission [9]. Although not a primary outcome, results from this study showed similar findings. Those patients under CCM showed a statistically significant decrease in the mean PHQ-9 score at 6 months when compared to patients under usual care. The initial mean PHQ-9 score of those in CCM was 15.12; this decreased to a mean score of 4.44 at 6 months (71% reduction). The 6-month mean score also reflects remission which is defined as a PHQ-9 score of <5.0. Although patients in usual care showed treatment response at 6 months with a decrease in mean PHQ-9 score of at least 50% (mean score of 7.13), the mean difference in mean score reduction was significantly greater among those in CCM.

The study accepted the hypothesis that antidepressant medication utilization between the two groups (CCM and usual care) would be different. Patients followed under CCM had significantly higher medication utilization when compared to those in usual care. At 6 months, the CCM group

Table 2.   Baseline and Six-Month Antidepressant Medication Utilization Among Patients in CCM and Usual Care

Variable	Overall		Diamond		Usual Care		P
	(N=333)		(N=242)		(N=91)		
# of Meds Pre CCM enrollment	0.52	± 0.68	0.5	± 0.68	0.58	± 0.70	0.33
# of Meds at Index date	0.99	± 0.64	1	± 0.62	0.97	± 0.71	0.64
# of Meds 6 months Post enrollment	1.09	± 0.88	1.19	± 0.88	0.82	± 0.85	<.001
Change of # of Meds from pre to index	0.47	± 0.77	0.5	± 0.75	0.38	± 0.83	0.21
Change of # of Meds from index to post	0.1	± 0.97	0.19	± 0.95	-0.14	± 0.98	0.006
Change of # of Meds from pre to post	0.57	± 0.99	0.69	± 0.97	0.24	± 0.98	<.001

also had more change in medications from the index date compared to the usual care group. This observation would correlate to the close follow-ups and more aggressive medication adjustments that occur under the CCM. It also equates to significantly greater treatment response as reflected in PHQ-9 scores. The STAR*D trial demonstrated that simply starting patients on antidepressant medications without care coordination only helped a third of these patients; medication adjustment and changes in response to patients' symptoms are hard to coordinate in usual practice. Under CCM, the care managers can bring forward treatment response issues to the attention of both the primary care physicians and collaborating psychiatrist so appropriate adjustments or changes can be made. Prior studies have also shown that depression care management can lead to significantly lower depression scores and a higher rate of antidepressant adherence when compared to usual care [14, 15]. Treatment adherence was not specifically analyzed in this study and may be worthwhile to evaluate along with other factors that are associated with a higher treatment response rate in CCM.

Interestingly, no difference in both 6-month PHQ-9 scores and medication utilization was seen in the subset of patients aged 65 years and older. The number of eligible subjects (N=35) in this age group is too small to account for any difference in findings. A larger sample of patients in this age group might yield a different result.

The study has several limitations. It was conducted among community dwellers, mostly white, who were followed at an academic institution in midwestern United States. Findings may not be generalized to other patient population, including minority groups. Medication utilization data were abstracted from patients' records and would not reflect prescription filling patterns which could be captured from a pharmacy-based registry data. In addition, dosage changes and patient compliance were not tracked. The study likewise did not take into account adjuvant psychotherapy which could impact medication usage. The secondary outcomes of 6 month response and remission rates were obtained by comparing initial and follow-up PHQ-9 scores. While this is a well-validated depression tool particularly among primary care practices, it may over-estimate clinical response over a time course. A previously reported study had shown treatment superiority of a collaborative program for depression among high utilizers in primary care as compared to usual care at six months with use of patients' self assess-

ment tool such as the PHQ-9 but no significant difference between treatment groups when a physicians' clinical assessment tool such as the Hamilton Depression Rating Scale (HAMD-17) was administered [16]. However, since the adopted model primarily relied on telephone based follow-ups by the care manager and patient encounters with their primary care physicians, use of the PHQ-9 was most appropriate.

CONCLUSION

In conclusion, the CCM for depression management is associated with greater antidepression medication utilization compared to usual care. It is also statistically significantly associated with a greater reduction in PHQ-9 scores at 6 months and remission when compared to usual care. These findings have significant implications in depression management particularly among primary care settings.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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