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Association Between Having a Caregiver and Clinical Outcomes 1 Year After Hospitalization for Cardiovascular Disease

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Abstract

Caregivers may represent an opportunity to improve cardiovascular disease (CVD) outcomes but prospective data are limited. We studied 3188 consecutive patients [41% minority, 39% female] admitted to a university hospital medical cardiovascular service to evaluate the association between having a caregiver and rehospitalization/death at 1 year. Clinical outcomes at 1 year were documented by a hospital-based clinical information system supplemented by standardized questionnaire. Comorbidities were documented by hospital electronic record review. At baseline, 13% (n=417) of patients had a paid caregiver and 25% (n=789) had only an informal caregiver. Having a caregiver was associated with rehospitalization or death at 1 year (OR=1.68; 95%CI=1.45–1.95), which varied by paid (OR=2.46; 95%CI=1.96–3.09) and informal (OR=1.40; 95%CI=1.18–1.65) caregiver status. Having a caregiver was significantly (p<.05) associated with age ≥65 years, racial/ethnic minority, lack of health insurance, past medical history of diabetes mellitus or hypertension, a Ghali comorbidity index >1, chronic obstructive pulmonary disease, or taking ≥ 9 prescriptions medications. The relation between caregiving and rehospitalization/death at 1 year was attenuated, but remained significant after adjustment (Paid OR=1.64; 95%CI=1.26–2.12 and Informal OR=1.20; 95%CI=1.00–1.44). In conclusion, risk of rehospitalization/death was significantly higher among cardiac patients with caregivers and was not fully explained by traditional comorbidities. Systematic determination of having a caregiver may be a simple method to identify patients at heightened risk of poor clinical outcomes.

Keywords

Cardiovascular Disease; Caregiving; Outcomes; Prevention

INTRODUCTION

Cardiac caregivers may represent a vast and untapped potential to improve quality cardiovascular disease (CVD) care and to reduce healthcare costs. We have shown that informal cardiac caregivers are frequently involved in tasks that have the potential to

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improve CVD outcomes such as medical follow-up, medication adherence, and nutrition (1). The purpose of the current study was to evaluate the association between type of caregiving (paid and informal) at baseline and rates of readmission due to all-causes and CVD, and mortality in the short term (30 days) and longer term (1 year), following admission to the medical cardiovascular service at a major university hospital. A secondary aim was to evaluate the prevalence of comorbidities among patients with and without caregivers to assess the potential for cardiac caregivers to impact outcomes among those at highest risk of readmission or death.

METHODS

The National Heart, Lung, & Blood Institute-sponsored Family Cardiac Caregiver Interinvestigation To Evaluate Outcomes (**FIT-O**) Study was a prospective study designed to evaluate patterns of caregiving among cardiac patients and its association with clinical outcomes of patients hospitalized with CVD (1). Consecutive patients admitted to the CVD service line at Columbia University Medical Center/New York Presbyterian Hospital (CUMC/NYPH) between November 2009 and June 2010 were asked to complete a standardized questionnaire regarding caregiving (93% enrollment rate). Medical cardiovascular service patients (N=3188) who had 1 year follow up by June 2011 were included in the primary analysis. The baseline characteristics and patterns of caregiving in this population have been published previously (1). Briefly, hospital admission logs were reviewed daily to identify patients admitted to the CVD service, and trained bilingual research staff systematically distributed surveys in English and Spanish to potential participants to assess whether or not they had a caregiver within the past year and plans for one after discharge. Patients were excluded from survey administration if they were unable to read or understand English or Spanish, lived in a full-time nursing facility, mental status precluded participation, or they refused to complete the survey. Hospital logs were checked weekly to detect any uncollected surveys. If uncollected surveys were detected, research staff attempted to contact the patient prior to discharge, or in the event this was not feasible, the survey was mailed with a pre-stamped return envelope for the patient to complete and return. The study was approved by the Institutional Review Board of CUMC.

The definition of caregiving was adapted from the report of the National Alliance of Caregiving and AARP (2). Methods for standardized assessment of caregiving have been described in our prior work (1). A caregiver was defined as 1) a paid professional (e.g. nurse/home aide) or 2) an informal (non-paid) person, who assists the patient with medical and/or preventive care. Data on having a caregiver in the past year and plans for having a caregiver after discharge were evaluated and found to be similar, therefore the former was used. Patients who reported having both paid *and* informal caregivers [n=120] were categorized as having a paid caregiver.

The extent of caregiving provided to each participant who reported having a caregiver was systematically assessed based on the specific tasks the caregiver performed. Tasks were defined using Basic Activities of Daily Living (e.g., assistance with dressing, bathing), and Instrumental Activities of Daily Living (e.g., assistance with meal preparation, transportation). Extent of caregiving provided was categorized as 1) Extensive (patient has a paid caregiver or an informal caregiver who provides assistance with Basic Activities of Daily Living only, or Basic Activities of Daily Living plus Instrumental Activities of Daily Living), or 2) Non-Extensive (informal caregiver provides assistance with Instrumental Activities of Daily Living or less, or patient has no caregiver).

Baseline characteristics, medical history, admission diagnoses, and prescription medications were documented by standardized electronic chart review. Patient medical records were

accessed via a secure and comprehensive electronic clinical information system at CUMC/NYPH. Admission diagnosis (CVD vs. Non-CVD) was determined by ICD-9 billing code for admission or primary diagnosis, and were validated in a sub-study by an independent physician reviewer blinded to ICD-9 billing code and caregiver status (n=50; kappa=0.99). All research staff members were HIPAA trained and certified in the use of this clinical information system. Current and prior medical conditions including diabetes mellitus, renal disease, myocardial infarction, peripheral vascular disease, heart failure, and chronic obstructive pulmonary disease were determined using ICD-9 billing codes and physician or nurse practitioner notes. Prior medical history information was collected by a trained nurse research assistant and was available for 99% of this population. The number of different prescribed medications and names and/or types of medications were obtained from discharge summary notes and supplemented by the ambulatory electronic records if needed.

The primary outcome was all-cause rehospitalization or death within 1 year and secondary outcomes were CVD rehospitalization and all-cause mortality assessed individually. Methods used to collect outcomes data were similar to those previously tested in other studies of hospitalized CVD patients (3). Rehospitalization was systematically obtained via CUMC/NYPH electronic clinical information systems which is updated daily. Patients' admitting date, admitting diagnosis, and primary diagnose(s) for each hospitalization and rehospitalization were recorded. Readmission type was classified (CVD vs. Non-CVD) using ICD-9 billing codes. To supplement outcomes data obtained by CUMC/NYPH electronic medical records, all patients were systematically contacted via mail or telephone 1 year after the index hospitalization that corresponded with their baseline survey interview date and queried regarding rehospitalization in the prior year (80% response rate). Rehospitalization was defined as rehospitalization at CUMC/NYPH or elsewhere, for CVD or for other reasons; analyses using this definition were similar to analysis limited to readmission to CUMC/NYPH only. Vital status was obtained via the clinical information system, which is updated monthly with National Death Index data.

The Ghali Comorbidity Index (Ghali-CI) was calculated on all patients using past medical history data obtained through systematic electronic record review. The Ghali-CI was developed by assigning study-specific data-derived weights to the original, widely-used Charlson comorbidity variables (4–6). Condition and study-specific comorbidity weights have been shown to be better predictors of adverse outcomes than standard scores used to summarize comorbidity (4). The Ghali-CI has been shown to be superior to the Charlson for prediction of in-hospital mortality among cardiac patients (6). The weighted conditions used to calculate the Ghali-CI are: myocardial infarction, heart failure, peripheral vascular disease, and moderate or severe renal disease. Total score range is 0–11, with patients scoring 0 at the lowest risk. For analysis the Ghali-CI was dichotomized at >1 versus ≤1 based on research indicating scores >1 are consistent with significant comorbidities. In a subset of participants with data available to calculate both scores the Ghali-CI was significantly correlated with New York State Department of Health Risk Scores for percutaneous coronary intervention (n=613; p<.001).

Surveys were created and processed using the intelligent character recognition software EzDataPro32™ (version 8.0.7, Creative ICR, Inc., Beaverton, OR) and ImageFomula (version Dr-2580C, Canon U.S.A., Inc., New York, NY). The data were double checked for errors and stored in a Microsoft Access database. Descriptive data are presented as frequencies and percentages. Caregiving was categorized as having paid, informal, or any (either paid or informal) caregivers. Chi-square tests were performed to determine the association between caregiving and baseline characteristics of hospitalized CVD patients using a Bonferroni correction for multiple comparisons (p<0.017). The independent association between caregiving and clinical outcomes was evaluated by logistic regression

adjusted for confounders. A stratified analysis by baseline admission type (current or prior heart failure versus no history of heart failure) was also conducted.

To evaluate the potential role of exposure selection bias, propensity score weights were calculated and a propensity score-weighted logistic model was fitted (7); model covariates included demographic variables (age, gender, race/ethnicity, health insurance), Ghali-CI, and comorbid conditions not accounted for by the Ghali-CI, but associated with death or rehospitalization at 1 year (diabetes mellitus, chronic obstructive pulmonary disease, number of prescription medications at discharge, and history of hypertension). Analyses were conducted using SAS software (version 9.2, SAS Institute, Cary, NC). Statistical significance for logistic regression models was set at $p < 0.05$.

RESULTS

Among 3188 consecutively admitted cardiology patients enrolled in the study, 1206 (38%) reported having any type of caregiver, and 789 (25%) had informal caregivers only. A summary of the prevalence of demographic factors and comorbidities according to paid, informal, or no caregiver status is presented in Table 1. Patients without a caregiver had substantially fewer comorbid conditions.

Univariate associations between caregiving and death or rehospitalization were examined at 30 days and at 1 year after hospital admission. At 30 days, having a caregiver was significantly associated with death or rehospitalization (OR=1.31; 95% CI=1.05–1.64) and varied by paid caregiving (OR=1.70; 95% CI=1.26–2.29) and informal caregiving (OR=1.12; 95% CI=0.86–1.46). Having a caregiver was associated with increased risk of death or rehospitalization at 1 year compared to not having a caregiver (OR =1.68; 95% CI=1.45–1.95). Associations between type of caregiving and clinical outcomes at 1 year are presented in Table 2. Among patients with (n=770) and without (n=2418) heart failure (prior or current) the association was similar at 30 days (OR=1.40; 95% CI=0.93–2.11 and OR=1.20; 95% CI=0.92–1.57, respectively) and 1 year (OR=1.31; 95% CI=0.97–1.79 and OR=1.60; 95% CI=1.35–1.90, respectively).

Evaluation of extent of caregiving showed 18% of patients received extensive caregiving and 82% received non-extensive caregiving. Patients who received extensive caregiving were at higher risk of death or rehospitalization at 1 year compared to their counterparts (Table 2). These associations remained statistically significant after adjustment for demographic factors and comorbidities.

Factors associated with death or rehospitalization 1 year after admission included age ≥ 65 years, lack of health insurance, diabetes mellitus, renal disease, myocardial infarction, peripheral vascular disease, heart failure, chronic obstructive pulmonary disease, and history of hypertension. Multivariate models adjusted for demographics and comorbidities are shown in Table 3. Adjustment resulted in attenuation of the associations between paid caregiving and informal caregiving with death or rehospitalization at 1 year. A propensity score weighted outcome model of the association between having a caregiver and death or rehospitalization at 1 year yielded similar results to those observed in univariate analysis (OR=1.67; 95% CI=1.43–1.95).

DISCUSSION

This is the first systematic prospective evaluation of the association between having a caregiver and clinical outcomes following hospitalization for non-surgical cardiac disease. We documented that patients with caregivers were more likely to be rehospitalized or deceased at 1 year compared to those without caregivers. The association was attenuated but

remained significant after adjustment for demographics and comorbidities. As expected, we documented that patients with comorbidities had an increased risk of rehospitalization or death. Of note, one in four hospitalized cardiology patients had an informal caregiver, and among them more than 50% were taking nine or more medications daily, and half had significant comorbidities (Ghali-CI>1). These data suggest that systematic determination of caregiver status may identify patients at high risk for rehospitalization and death independent of assessment of standard demographics and comorbidities.

Patients with caregivers were among the sickest hospitalized patients in our study, lending support to targeting them for interventions aimed to reduce rehospitalizations. Our data showing that patients with caregivers have greater comorbidities is consistent with other reports. It has been documented that patients with more than one cardiac condition (e.g. coronary heart disease and heart failure) are more likely to have a caregiver compared to patients without a comorbid cardiac condition (8). U.S. population data indicates that most caregivers (90%) report the person they care for takes prescription medicine (9). In a study of caregivers of readmitted patients with heart failure, more than one in three (36%) attributed the patient's rehospitalization to contributing conditions other than heart failure (10).

The observation that having a caregiver is significantly associated with an increased rate of rehospitalization or death may have several explanations. The higher risk associated with caregiving could be due to residual confounding, however propensity analysis suggested this was unlikely to explain the finding. Moreover, among the sickest patients in our study (Ghali-CI >3; n=954) caregiving remained a significant predictor of death or rehospitalization at 1 year, suggesting factors other than comorbidities that are traditionally evaluated contributed to the association. Another explanation may be that caregivers facilitate patient access to healthcare providers through closer monitoring and adherence to follow-up visits (11, 12). An alternative hypothesis may be related to negative interactions between caregivers and patients. Family influences have the potential to hinder the care of patients if significant family-related barriers are present, such as nagging or criticizing about illness care, and overprotectiveness (13, 14). Neither gender nor marital status was a predictor of rehospitalization in this study, suggesting that relationship influences did not play a significant role.

There are limitations to this study that should be considered. First, caregiver status may have been misclassified; however the likely impact would be non-differential and would reduce our ability to observe an association. Similarly, some rehospitalization data was ascertained by self-report and may have been misclassified. Study results were not found to differ when the analysis was restricted to rehospitalization at CUMC/NYPH, which had 100% outcome ascertainment. Location of rehospitalization was not differential with respect to caregiver status suggesting any bias was non-systematic and unlikely to affect point estimates for the association between caregiving and rehospitalization.

Likely, there are unmeasured factors that predict clinical outcomes that are associated with having a caregiver that should be explored in future research. In the interim, systematic assessment of caregiver status may be a unique means to identify patients at risk for adverse outcomes.

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References

1. Mosca L, Mochari-Greenberger H, Aggarwal B, Liao M, Suero-Tejeda N, Comellas M, Rehm L, Umann TM, Mehran R. Patterns of caregiving among patients hospitalized with cardiovascular disease. *J Cardiovasc Nurs*. 2011; 26:305–311. [PubMed: 21330929]
2. National Alliance for Caregiving and AARP. Caregiving in the US. Washington, DC: National Alliance for Caregiving and AARP; 2004. p. 83<http://www.caregiving.org/data/04finalreport.pdf>
3. Cavender MA, Alexander KP, Broderick S, Shaw LK, McCants CB, Kempf J, Ohman EM. Long-term morbidity and mortality among medically managed patients with angina and multivessel coronary artery disease. *Am Heart J*. 2009; 158:933–940. [PubMed: 19958859]
4. Ghali WA, Hall RE, Rosen AK, Ash AS, Moskowitz MA. Searching for an improved clinical comorbidity index for use with ICD-9-CM administrative data. *J Clin Epidemiol*. 1996; 49:273–278. [PubMed: 8676173]
5. Ghali WA, Hall RE, Ash AS, Rosen AK, Moskowitz MA. Evaluation of complication rates after coronary artery bypass surgery using administrative data. *Methods Inf Med*. 1998; 37:192–200. [PubMed: 9656664]
6. Schneeweiss S, Maclure M. Use of comorbidity scores for control of confounding in studies using administrative databases. *Int J Epidemiol*. 2000; 29:891–898. [PubMed: 11034974]
7. Leslie, S.; Thiebaud, P. [Accessed 7/14/11] Using Propensity Scores to Adjust for Treatment Selection Bias; SAS Global Forum. 2007. p. 4<http://www2.sas.com/proceedings/forum2007/184-2007.pdf>
8. Gure TR, Kabeto MU, Blaum CS, Langa KM. Degree of Disability and Patterns of Caregiving among Older Americans with Congestive Heart Failure. *J Gen Intern Med*. 2008; 23:70–76. [PubMed: 18030537]
9. National Alliance for Caregiving and AARP. Caregiving in the US, 2009. National Alliance for Caregiving and AARP; 2009. p. 74http://www.caregiving.org/data/Caregiving_in_the_US_2009_full_report.pdf
10. Annema C, Luttik ML, Jaarsma T. Reasons for readmission in heart failure: Perspectives of patients, caregivers, cardiologists, and heart failure nurses. *Heart Lung*. 2009; 38:427–434. [PubMed: 19755193]
11. Jaarsma T, van der Wal MH, Lesman-Leegte I, Luttik ML, Hogenhuis J, Veeger NJ, Sanderma R, Hoes AW, van Gilst WH, Lok DJ, Dunselman PH, Tijssen JG, Hillege HL, van Veldhuisen DJ. Coordinating Study Evaluating Outcomes of Advising and Counseling in Heart Failure (COACH) Investigators. Effect of moderate or intensive disease management program on outcome in patients with heart failure: Coordinating Study Evaluating Outcomes of Advising and Counseling in Heart Failure (COACH). *Arch Intern Med*. 2008; 168:316–324. [PubMed: 18268174]
12. Jaarsma T, van Veldhuisen DJ. When, how and where should we “coach” patients with heart failure: The COACH results in perspective. *Eur J Heart Fail*. 2008; 4:331–333. [PubMed: 18353718]
13. Rosland AM, Heisler M, Choi HJ, Silveira MJ, Piette JD. Family influences on self-management among functionally independent adults with diabetes or heart failure: do family members hinder as much as they help? *Chronic Illn*. 2010; 6:22–33. [PubMed: 20308348]
14. Clarke DE, Walker JR, Cuddy TE. The role of perceived overprotectiveness in recovery 3 months after myocardial infarction. *J Cardpulm Rehabil*. 1996; 16:372–377.

Table 1

Prevalence of Demographic Factors and Comorbidities by Caregiver Status among Hospitalized Medical Cardiovascular Service Patients (N=3188)

Variable	Have a Paid Caregiver ^a (N=417) ^[A]	Have an Informal Caregiver (N=789) ^[B]	Have no Caregiver (N=1982) ^[C]	p-value
Age ≥ 65 years	319 (77%) ^{B,C}	434 (55%) ^{A,C}	937 (47%) ^{A,B}	<0.0001
Men	174 (42%) ^{B,C}	536 (68%) ^{A,C}	1226 (62%) ^{A,B}	<0.0001
Minority Race/Ethnicity ^b	188 (51%) ^{B,C}	308 (42%) ^A	731 (39%) ^A	<0.0001
Not Married/No Partner ^c	218 (62%) ^{B,C}	257 (38%) ^{A,C}	816 (47%) ^{A,B}	<0.0001
No Health Insurance	107 (26%) ^{B,C}	110 (14%) ^A	268 (14%) ^A	<0.0001
Diabetes Mellitus	201 (48%) ^{B,C}	311 (39%) ^{A,C}	592 (30%) ^{A,B}	<0.0001
Prior/Current Renal Disease	133 (32%) ^{B,C}	179 (23%) ^{A,C}	304 (15%) ^{A,B}	<0.0001
Prior/Current Myocardial Infarction	136 (33%)	271 (34%) ^C	551 (28%) ^B	0.0015
Prior/Current Peripheral Vascular Disease	87 (21%) ^{B,C}	108 (14%) ^{A,C}	189 (10%) ^{A,B}	<0.0001
Prior/Current Heart Failure	171 (41%) ^{B,C}	226 (29%) ^{A,C}	371 (19%) ^{A,B}	<0.0001
Chronic Obstructive Pulmonary Disease	49 (12%) ^C	64 (8%) ^C	84 (4%) ^{A,B}	<0.0001
Hypertension (history)	333 (80%) ^C	604 (77%) ^C	1368 (69%) ^{A,B}	<0.0001
Dyslipidemia (history)	263 (63%)	479 (61%)	1205 (61%)	0.6682
Current Smoker	15 (4%) ^C	59 (7%) ^C	208 (11%) ^{A,B}	<0.0001
≥9 Prescribed Medications ^d	288 (72%) ^{B,C}	422 (54%) ^{A,C}	866 (44%) ^{A,B}	<0.0001
Ghali Comorbidity Index >1	265 (64%) ^{B,C}	384 (49%) ^{A,C}	683 (35%) ^{A,B}	<0.0001

^a Patients reporting both paid and informal caregivers [n=120] were classified as having paid caregivers

^b n=201 without race/ethnicity information

^c n=427 without marital status information

^d Variable dichotomized at mean number of prescribed medications; n=50 without medication information Superscript [A], [B], and [C] denote statistically significant differences between column percentages; statistical significance set at p<0.017 with Bonferroni correction for multiple comparisons

Table 2

Association between Caregiving and Clinical Outcomes at 1 Year

Variable	Clinical Outcomes			
	Death	Death or Rehospitalization	Rehospitalization for All Causes	Rehospitalization for CVD
	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)
Type of Caregiving				
Paid vs. None ^a	3.42 (2.52–4.65)	2.46 (1.96–3.09)	1.67 (1.35–2.07)	1.54 (1.25–1.91)
Informal vs. None	1.95 (1.46–2.59)	1.40 (1.18–1.65)	1.22 (1.04–1.45)	1.21 (1.02–1.43)
Paid vs. Informal ^a	1.76 (1.26–2.45)	1.76 (1.37–2.27)	1.36 (1.07–1.73)	1.28 (1.01–1.62)
Extent of Caregiving				
Extensive vs. Non-Extensive ^a	3.11 (2.39–4.05)	2.27 (1.86–2.77)	1.58 (1.31–1.90)	1.49 (1.24–1.80)

^aPatients who reported having both paid *and* informal caregivers [n=120] were categorized as having paid caregivers

CVD=Cardiovascular Disease

Table 3

Multivariate Models: Association between Caregiving and Death or Rehospitalization at 1 Year among Hospitalized Medical Cardiovascular Service Patients

Variable	Death or Rehospitalization at 1 Year			
	Model 1: Bivariate	Model 2: Demographic Adjusted	Model 3: Demographic/ Comorbidity Adjusted	Model 4: Fully Adjusted
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Had a Paid Caregiver ^a	2.46 (1.96–3.09)	2.19 (1.71–2.81)	1.87 (1.45–2.40)	1.64 (1.26–2.12)
Had an Informal Caregiver ^a	1.40 (1.18–1.65)	1.34 (1.13–1.59)	1.23 (1.03–1.47)	1.20 (1.00–1.44)
Age ≥65 years		1.42 (1.22–1.65)	1.30 (1.12–1.52)	1.22 (1.04–1.43)
Minority Race/Ethnicity		1.09 (0.93–1.27)	1.06 (0.90–1.24)	1.10 (0.93–1.30)
Men		1.04 (0.89–1.21)	1.01 (0.87–1.18)	1.04 (0.89–1.22)
No Health Insurance		1.40 (1.12–1.75)	1.32 (1.05–1.66)	1.32 (1.05–1.66)
Ghali Comorbidity Index Score >1			2.08 (1.78–2.43)	1.79 (1.52–2.10)
≥9 Medications				1.79 (1.52–2.11)
Diabetes Mellitus				1.15 (0.97–1.36)
Chronic Obstructive Pulmonary Disease				1.07 (0.77–1.48)
Hypertension (history)				0.96 (0.80–1.15)

^aReferent group=Have no caregiver; Patients who reported having both paid *and* informal caregivers [n=120] were categorized as having a paid caregiver