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Quality of Life and Psychosocial Factors in African Americans with Hypertensive Chronic Kidney Disease

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Abstract

Health-related quality of life (HRQOL) is poorly understood in patients with chronic kidney disease (CKD) prior to end-stage renal disease. The association between psychosocial measures and HRQOL has not been fully explored in CKD, especially in African Americans. We performed a cross-sectional analysis of HRQOL and its association with sociodemographic and psychosocial factors in African Americans with hypertensive CKD.

There were 639 participants in the African American Study of Kidney Disease and Hypertension Cohort Study. The Short Form-36 was used to measure HRQOL. The Diener Satisfaction with Life Scale measured life satisfaction, the Beck Depression Inventory-II assessed depression, the Coping Skills Inventory-Short Form measured coping, and the Interpersonal Support Evaluation List-16 was used to measure social support.

Mean participant age was 60 years at enrollment, and 61% were male. Forty-two percent reported a household income below \$15,000/year. Higher levels of social support, coping skills, and life satisfaction were associated with higher HRQOL, while unemployment and depression were

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higher estimated glomerular filtration rate (eGFR) with the Physical Health Composite (PHC) score ($p=0.004$) but not the Mental Health Composite (MHC) score ($p=0.24$).

Unemployment was associated with lower HRQOL, and lower eGFR was associated with lower PHC. African Americans with hypertensive CKD with better social support and coping skills had higher HRQOL. This study demonstrates an association between CKD and low HRQOL and highlights the need for longitudinal studies to further examine this association.

Introduction

The association between health-related quality of life (HRQOL) and clinically important outcomes among patients with end-stage renal disease (ESRD) has been well-established.(1) (2)(3)(4) The association with other psychosocial measures, such as social support and depressive symptoms, and HRQOL has also been described among ESRD patients, demonstrating that lower levels of social support and depression are associated with mortality and poor HRQOL.(5)(6)(7) However, there is a paucity of information regarding these measures in patients with chronic kidney disease (CKD), especially among African-Americans. Since African Americans with CKD are at increased risk of developing ESRD compared to whites, a better understanding HRQOL in this vulnerable population is needed. (8)(9)(10) Moreover, African Americans with CKD due to hypertension are a large subgroup of this population at particular risk for CKD progression.(10)

There have been few long-term studies of African Americans with CKD. The African American Study of Kidney Disease and Hypertension (AASK Trial) was initially a randomized controlled clinical trial of three antihypertensive drug regimens and two levels of blood pressure control.(11) After the trial was completed, eligible clinical trial participants were invited to enroll in a prospective cohort study with recommended use of an angiotensin converting enzyme inhibitor or an angiotensin receptor blocker as initial antihypertensive drug therapy and a target blood pressure goal of less than 130/80 mmHg. (12) Psychosocial measures were added to the battery of questionnaires administered to participants during the cohort phase of the study. The purpose of this study is to describe the association of baseline HRQOL and various psychosocial measures, including satisfaction with life, coping skills, social support, and depression in African Americans with hypertensive chronic kidney disease in the AASK Cohort study.

Methods

Study design

We conducted a cross-sectional baseline analysis of HRQOL in AASK Cohort participants. The design and methods have been described previously.(12) Among 764 eligible participants at the end of follow-up for the clinical trial, 691 were enrolled in the cohort study. As described in a previous publication, participants who chose not to enroll in the cohort phase of the study had similar renal function and proteinuria at the last trial visit compared to those who chose to enroll in the cohort phase.(13) All participants provided written informed consent and the study was approved by the Institutional Review Boards.

Variables and Data Sources

HRQOL was assessed by the Medical Outcomes Study 36-item Short Form Health Survey (SF-36) and several psychosocial instruments. The SF-36 is a 36-item questionnaire that is an assessment of quality of life used in both health and illness.(14) The SF-36 has two subscales, Physical Health Composite (PHC) and Mental Health Composite (MHC), with mean scores of 50 in the general population.

The Beck Depression Inventory II (BDI-II) was used to assess depressive symptoms. Scores on the BDI range from 0-63, and scores ≥ 11 are consistent with depression in CKD.(15) Social support was measured using the Interpersonal Support Evaluation List-16 (ISEL-16), an adaptation of a longer instrument.(16) The ISEL-16 has a maximum score of 48, with higher scores reflecting higher perceived social support. Coping skills were assessed by the Coping Skills Inventory-Short Form (CSI-SF).(17) The CSI-SF includes two summary scales: overall engagement and overall disengagement. The Diener Satisfaction with Life Scale (SWLS) has five items with a satisfaction rating of 1 to 7 (low to high) for each item.(18) An average score of the five items was used.

Sociodemographic variables and comorbidities were reported by participants at enrollment. Estimated glomerular filtration rate (eGFR) was calculated using the AASK Study Equation (19) using creatinine values obtained at cohort study entry.

Statistical methods

Participants' baseline mean PHC and MHC scores were described according to demographic and clinical characteristics. ANOVA was used to assess differences between mean MHC and PHC among categories of sociodemographic and clinical characteristics. Mean scores of the psychosocial instruments were determined for quartiles of MHC and PHC scores, and were assessed for differences among the quartiles. Multivariable linear regression analysis was used to assess the association between baseline MHC and PHC and baseline sociodemographic and clinical characteristics. Statistical analyses were performed with Unix SAS version 8.2 (Cary, NC, USA).

Results

Participants and Characteristics

Among 691 subjects enrolled in the cohort study 639 (92.4%) completed the SF-36. Their mean age was 60 years, 61% were male and 42% reported an annual income less than \$15,000. Cardiovascular disease (21.4%), and a history of stroke (18.1%) were the most common self-reported illnesses. The mean BMI was 31.4 ± 7.1 kg/m². The mean blood pressure was 136/81 ($\pm 22/12$) mmHg. The mean eGFR was 43.8 ± 17 ml/min/1.73 m² and mean urine protein was 0.38 ± 0.85 g/g (urinary protein-creatinine ratio).

Sociodemographic and Clinical Characteristics by Baseline HRQOL Scores

The mean MHC and PHC for the cohort were 46.3 ± 10.5 and 40.4 ± 10 , respectively, and the scores were normally distributed. Significantly higher MHC was observed in older persons (age > 65) and in men ($p < 0.05$) (Table 1). Participants with income less than \$15,000, the unemployed, and those with Medicare/Medicaid as insurance had lower PHC and MHC than those with higher income, those who were employed, and those with private or self-insurance ($p < 0.05$). PHC and MHC were significantly lower in individuals with cardiovascular disease, psychiatric illness, and asthma/COPD compared to those without these conditions ($p < 0.05$, see Table 2). Participants with a history of stroke and diabetes had significantly lower PHC compared to those without those conditions ($p < 0.05$) but no significant difference was observed in MHC in these subgroups. Mean PHC and MHC decreased as the number of comorbid illnesses increased ($p < 0.05$).

HRQOL Scores by Strata of eGFR

Participants with lower quintiles of eGFR had significantly lower mean PHC, ($p < 0.05$, see Table 3). There was no significant association between MHC and eGFR ($p = 0.24$).

HRQOL Scores and Baseline Psychosocial Scores

Mean social support, satisfaction with life, and scores on most coping subscales were significantly higher by increasing quartiles of MHC and PHC ($p < 0.05$, see Figures 1 and 2). However, there was a significant inverse association between quartiles of MHC and PHC and mean BDI-II scores ($p < 0.05$).

Independent Association of Demographic and Clinical Characteristics and MHC Scores

In multivariable regression analysis, age was independently associated with MHC. Adjusted mean (SE) MHC scores were 0.22 (0.05) higher ($p < 0.0001$) in older individuals than in younger participants (Table 4). Unemployed participants had adjusted mean (SE) MHC scores 0.73 (0.17) lower ($p < 0.0001$) than employed participants. Participants with a history of cardiovascular disease had adjusted mean (SE) MHC scores 3.1 (1.01) lower than those without such history ($p = 0.003$). Those with a history of psychiatric illness had adjusted mean (SE) MHC scores 10.4 (2.13) lower than those without a history of mental illness ($p < 0.001$). eGFR was not independently associated with MHC scores.

Independent Association of Demographic and Clinical Characteristics and PHC Scores

In multivariable regression analysis, adjusted mean (SE) PHC scores were 0.79 (0.17) lower ($p < 0.001$) in unemployed than in employed participants (Table 5). Those with higher income had an adjusted mean (SE) PHC score 0.84 (0.40) higher ($p = 0.03$) than participants with lower incomes. Adjusted mean (SE) PHC scores were 5.74 (2.16) lower in those with history of psychiatric disease ($p = 0.0082$) compared to those without it, but PHC was not associated with other comorbid illnesses. Adjusted mean (SE) PHC scores were 0.05 (0.03) higher per each 1 ml/min/1.73 m² increase in eGFR ($p = 0.049$).

Discussion

Among a large cohort of African Americans with hypertensive CKD, we found that HRQOL was lower than that observed in the general population, in which mean PHC and MHC scores have been found to be 50 with standard deviation of 10. In our cohort, the mean PHC was much lower than the mean MHC.(20) Higher levels of social support, coping strategies, and satisfaction with life were associated with higher MHC and PHC scores, while a higher score on the BDI, a measure of depressive symptoms, was associated with lower HRQOL. Lower socioeconomic status and comorbid health conditions were associated with lower HRQOL scores, including level of kidney function which was negatively associated with PHC.

However, the association of lower eGFR with worse PHC has not been consistent in previous studies. This inconsistency may result from differences in HRQOL instruments or patient characteristics,(21) including level of eGFR and/or presence of more comorbidities. (22) While further studies are warranted to clarify the association between eGFR and PHC across populations, our findings suggest that increased attention should be directed to evaluating the physical domains of HRQOL in patients with CKD, particularly those with an eGFR < 30 ml/minute/1.73m².

We found that HRQOL was markedly lower in individuals with lower socioeconomic status and greater number of comorbid illnesses. This association has been consistently reported in non-CKD populations, as well as in other studies focusing on patients with ESRD and CKD. (23)(21)(24)(25)(26) Taken together, these findings indicate that individuals with CKD and lower socioeconomic status and/or multiple comorbidities represent a group at high risk for poor HRQOL.

Few studies have examined whether HRQOL can be improved in patients with CKD. Coping skills are a determinant to adjustment in many illnesses, and poor coping has been linked to negative clinical outcomes in other illnesses.(27) Several studies have examined coping strategies in kidney disease,(28) but this is one of few studies to examine the association between coping skills and HRQOL in CKD. It is not known whether improving coping skills could enhance HRQOL.

Previous studies have shown that poor social support is associated with lower HRQOL in ESRD patients; we have shown that this association is present in patients with CKD prior to ESRD.(5) Importantly, lower social support has been associated with increased mortality in ESRD patients.(7),(5) This relationship has not been investigated in patients with CKD prior to ESRD. Regardless, our findings suggest that enhancing social support may improve HRQOL in patients with CKD. Some examples of areas for potential intervention include provision of material support to assist with the daily burden of medical illness (e.g., support with transportation or medication administration), or provision of emotional support through an intervention such as therapy.(29)

The mechanisms underlying the association between social support and coping skills and HRQOL are not clear. A study in ESRD patients aimed at determining the relative importance and relationships between psychosocial factors and HRQOL demonstrated both a direct association between social support and HRQOL and that social support effects were moderated by patients' perceptions of their control over their illness.(30) Similar mediational analyses examining these variables have not been performed in CKD patients. Such studies are needed to gain a better understanding of potential targets for intervention for CKD patients with poor HRQOL.

There are several limitations to the study. Our study only included African Americans with hypertensive CKD, which may limit generalizability to patients with other causes of CKD and other racial/ethnic groups. Because of the cross-sectional design of our study we cannot assess causality of low HRQOL.

In conclusion, HRQOL was low in a cohort of African Americans with CKD, particularly PHC. Physicians should be aware that African Americans with CKD with low SES or low eGFR are at high risk for low HRQOL. However, better social support and coping skills were associated with higher HRQOL, which may be modifiable factors. The mechanisms underlying the association between social support and coping skills and HRQOL are not clear. This study underscores the high prevalence of low HRQOL in CKD and highlights the need for longitudinal studies to determine areas for intervention to improve HRQOL in this vulnerable and growing population.

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Abbreviations

HRQOL	health-related quality of life
ESRD	end-stage renal disease
CKD	chronic kidney disease
PHC	Physical Health Composite
MHC	Mental Health Composite

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Background

Low health-related quality of life (HRQOL) is associated with poor outcomes in patients with end-stage renal disease (ESRD), but less is known about HRQOL in chronic kidney disease (CKD) patients. African Americans with CKD are at risk for poor outcomes compared to whites. We examined the association between sociodemographic and psychosocial factors in African Americans with CKD. Poor coping, low social support, low life satisfaction, and depression were associated with low HRQOL. Translational significance: Clinicians may use HRQOL to screen patients at risk for poor outcomes. Future studies may examine interventions to improve social support and coping.

Figure 1.

a (top panel): Mean aggregate BDI-II (Beck Depression Inventory-II, open circles) and SWLS (Satisfaction with Life, closed circles) mean item scores (y axis) and standard deviations per quartile of MHC score.

b (bottom panel): Mean aggregate BDI-II (Beck Depression Inventory-II, open circles) and SWLS (Satisfaction with Life, closed circles) mean item scores (y axis) and standard deviations per quartile of PHC score.

Figure 2.

a (top panel): Mean aggregate ISEL (social support, open circles) and CSI-SF subscale (coping skills, closed circles=overall disengagement, X's=overall engagement) scores (y axis) and standard deviations per quartile of MHC score.

b (bottom panel): Mean aggregate ISEL (social support, open circles) and CSI-SF subscale (coping skills, closed circles=overall disengagement, X's=overall engagement) scores (y axis) and standard deviations per quartile of PHC score.

Table 1

PHC and MHC Scores in Subgroups by Sociodemographic Characteristics

Characteristic	Mean PHC	P value	Mean MHC	P value
Age (years)				
<65 (n=408)	40.1 ± 10.0	0.27	45.0 ± 10.7	< 0.001
>65 (n=231)	41.0 ± 10.0		48.5 ± 9.8	
Gender				
Male (n=396)	40.9 ± 10.0	0.13	47.1 ± 10.5	0.02
Female (n=243)	39.6 ± 10.1		45.0 ± 10.4	
Income (\$)				
< 15,000 (n=268)	38.2 ± 10.3	< 0.001	44.5 ± 11.1	0.001
15,000-39,999 (n=168)	41.4 ± 10.0		47.0 ± 9.8	
40,000 or more (n=66)	44.6 ± 8.1		50.1 ± 9.9	
Declined to answer (n=136)	41.6 ± 9.3		47.0 ± 9.7	
Education				
Not a high school graduate (n=251)	39.7 ± 9.6	0.12665	46.1 ± 10.1	0.64
High School graduate or beyond (n=387)	40.9 ± 10.2		46.5 ± 10.7	
Employment status				
Employed (n=235)	44.2 ± 8.2	< .0001	48.9 ± 8.8	< 0.001
Full-time homemaker (n=16)	39.0 ± 7.2		44.5 ± 10.5	
Retired (n=225)	39.1 ± 9.9		46.6 ± 10.2	
Unemployed (n=97)	37.4 ± 10.5		41.7 ± 11.1	
Other (n=65)	36.1 ± 11.9		43.2 ± 13.0	
Health Insurance				
Private/HMO/Other (n=196)	42.0 ± 9.5	< .0001	46.4 ± 10.0	0.01
Medicaid/Medicare (n=255)	37.8 ± 10.2		45.0 ± 10.9	
None/Uninsured (n=187)	42.3 ± 9.5		47.9 ± 10.2	

Table 2

PHC and MHC Scores in Subgroups by Clinical Characteristics

Characteristic (n=x, %)	Mean PHC	P value	Mean MHC	P value
Cardiovascular Disease				
Yes (n=137, 21.4%)	35.9 ± 10.4	< 0.001	42.8 ± 11.1	< 0.001
No	41.7 ± 9.6		47.2 ± 10.1	
Stroke				
Yes (n=116, 18.1%)	38.2 ± 9.4	0.005	45.2 ± 10.4	0.23
No	40.9 ± 10.1		46.5 ± 10.5	
Diabetes *				
Yes (n=60, 9.4%)	36.5 ± 9.8	0.04	44.8 ± 11.5	0.64
No	39.4 ± 10.2		45.5 ± 10.5	
Psychiatric illness				
Yes (n=23, 3.6%)	30.7 ± 10.2	< 0.001	33.1 ± 12.1	< 0.001
No	40.8 ± 9.8		46.8 ± 10.1	
Asthma/COPD				
Yes (n=48, 7.5%)	35.0 ± 10.5	0.001	40.9 ± 12.3	0.002
No	40.9 ± 9.9		46.7 ± 10.2	
Cancer				
Yes (n=36, 5.6%)	38.1 ± 11.1	0.14	46.5 ± 10.4	0.88
No	40.6 ± 10.0		46.3 ± 10.5	
Number of comorbidities				
None (n=318, 49.8%)	43.0 ± 9.2	< 0.001	47.9 ± 9.99	< 0.001
1 (n=183, 28.6%)	39.3 ± 9.9		45.8 ± 10.5	
2-3 (n=117, 18.3%)	36.8 ± 10.1		44.4 ± 10.1	
4 or more (n=20, 3.1%)	31.2 ± 10.3		36.0 ± 12.6	

* 443 patients responded to diabetes questionnaire

Table 3

MHC, PHC Scores by eGFR Category

	All Patients (N=639)	eGFR<30 (N=142)	eGFR 30-40 (N=118)	eGFR 40-50 (N=132)	eGFR 50-60 (N=136)	eGFR 60+ (N=107)	
Variable	n (%) or mean ± s.d.	n (%) or mean ± s.d.	n (%) or mean ± s.d.	n (%) or mean ± s.d.	n (%) or mean ± s.d.	n (%) or mean ± s.d.	p for trend
SF36 Mental Health Component Score	46.3 ± 10.5	44.9 ± 10.4	46.1 ± 11.3	47.1 ± 10.2	47.6 ± 9.96	45.9 ± 10.6	0.24
SF36 Physical Health Component Score	40.4 ± 10.0	37.8 ± 9.71	40.6 ± 9.92	42.3 ± 9.76	40.9 ± 10.1	41.0 ± 10.1	0.004

Table 4

Regression Analysis: Association of MHC and Demographic and Clinical Characteristics

Variable	Estimate	Lower Confidence Limit	Upper Confidence Limit	P value
Age	0.22	0.13	0.32	<0.001
Male Gender	1.83	−0.05	3.71	0.06
Unemployment	−0.73	−1.07	−0.38	<0.001
Higher Income	0.67	−0.12	1.47	0.10
Cardiovascular Disease	−3.08	−5.07	−1.10	0.003
Psychiatric Illness	−10.35	−14.53	−6.18	<0.001
COPD	−2.70	−5.71	0.317	0.08

Other variables considered for model: marital status, living arrangements (alone vs. not), insurance status, high school education, stroke, diabetes, cancer, number of comorbidities, and estimated GFR. These were not significant at the 0.15 level.

Table 5

Regression Analysis: Association of PHC and Demographic and Clinical Characteristics

Variable	Estimate	Lower Confidence Limit	Upper Confidence Limit	P value
Age	0.08	-0.02	0.17	0.10
Unemployment	-0.79	-1.13	-0.45	<0.001
Higher Income	0.84	0.06	1.62	0.03
Cardiovascular Disease	-2.25	-4.75	0.25	0.08
Psychiatric Illness	-5.74	-9.97	-1.51	0.008
Number of Comorbidities	-0.90	-1.96	0.16	0.10
Estimated GFR by 1 ml/min/1.73 m ²	0.05	0.0003	0.10	0.049

Other variables considered for model: male gender, marital status, living arrangements (alone vs. not), insurance status, high school education, stroke, diabetes, COPD, and cancer. These were not significant at the 0.15 level.