interquartile range of the difference between mGFR and eGFR. A negative bias means mGFR overestimation, whereas a positive value reflects mGFR underestimation.

Four patients were excluded due to difficulties measuring GFR; baseline demographics for the remaining 91 patients are in Table 1. As shown in Fig 1, $eGFR_{cys}$ performs better than $eGFR_{cr}$, demonstrating less bias and better accuracy (P_{30} = 62.6%). However, bias of $eGFR_{cr}$ and $eGFR_{cys}$ vary according to eGFR. In contrast, bias of $eGFR_{cr\text{-}cys}$ is intermediate and appears to vary less by eGFR, while accuracy is similar to $eGFR_{cys}$ (60.4%). These results agree with others recently reported in different ethnic groups.[8,9]

Estimating kidney function is highly relevant in patients with liver cirrhosis, including in some cases the need to decide candidacy for liver or combined liver and kidney transplantation.[10] The accuracies of $eGFR_{cys}$ and $eGFR_{cr\text{-}cys}$ are higher than $eGFR_{cr}$, but are limited at low eGFRs. Therefore, we suggest measuring GFR (by inulin or ^{99}Tc-DTPA clearance) if possible to make important decisions.

Finally, due to difficulties involved in obtaining mGFR, there is an urgent need for an eGFR equation with superior performance to be developed, designed, and validated in liver cirrhosis populations.

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Supplementary Material

Item S1: Detailed methods.

Note: The supplementary material accompanying this article (http://dx.doi.org/10.1053/j.ajkd.2015.09.022) is available at www.ajkd.org

References

1. Gines P, Schrier RW. Renal failure in cirrhosis. *N Engl J Med*. 2009;361(13):1279-1290.

2. Fede G, D'Amico G, Arvaniti V, et al. Renal failure and cirrhosis: a systematic review of mortality and prognosis. *J Hepatol*. 2012;56(4):810-818.

3. Orlando R, Floreani M, Padrini R, Palatini P. Evaluation of measured and calculated creatinine clearances as glomerular filtration markers in different stages of liver cirrhosis. *Clin Nephrol*. 1999;51(6):341-347.

4. Cocchetto DM, Tschanz C, Bjornsson TD. Decreased rate of creatinine production in patients with hepatic disease: implications for estimation of creatinine clearance. *Ther Drug Monit*. 1983;5(2):161-168.

5. White CA, Akbari A, Doucette S, et al. Effect of clinical variables and immunosuppression on serum cystatin C and beta-trace protein in kidney transplant recipients. *Am J Kidney Dis*. 2009;54(5):922-930.

6. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Inter*. 2013;3(suppl 1):1-150.

7. National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Am J Kidney Dis*. 2002;39(2)(suppl 1):S1-S266.

8. De Souza V, Hadj-Aissa A, Dolomanova O, et al. Creatinine- versus cystatine C-based equations in assessing the renal function of candidates for liver transplantation with cirrhosis. *Hepatology*. 2014;59(4):1522-1531.

9. Mindikoglu AL, Dowling TC, Weir MR, Seliger SL, Christenson RH, Magder LS. Performance of chronic kidney disease epidemiology collaboration creatinine-cystatin C equation for estimating kidney function in cirrhosis. *Hepatology*. 2014;59(4):1532-1542.

10. Nadim MK, Sung RS, Davis CL, et al. Simultaneous liver-kidney transplantation summit: current state and future directions. *Am J Transplant*. 2012;12(11):2901-2908.

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Latinos With Chronic Kidney Failure Treated by Dialysis: Understanding Their Palliative Care Perspectives

To the Editor:

Latinos are the fastest growing minority in the United States and have a nearly 2-fold faster progression from earlier stages of CKD to ESRD compared with non-Latino whites.[1(pp96,101)] Dialysis patients experience debilitating symptom burdens and high mortality; however, the literature suggests that despite growing awareness of the need for palliative care, symptoms are often untreated and care at the end of life (EOL) is aggressive and may not align with patient goals and values.[2-5] Latinos bear a disproportionate burden of ESRD and are under-represented in existing ESRD palliative care research. Studies that highlight Latino EOL care and preferences have predominantly shown that Latinos are less likely to have advance directives, more likely to die in a hospital, and when faced with EOL decisions, prefer a family-centered decision-making model.[6] As efforts are made to improve palliative care for all dialysis patients regardless of their ethnicity, it is important to recognize that cultural values profoundly affect care preferences. In this study, we describe the palliative care preferences and needs of adult Latino patients with chronic kidney failure treated by dialysis.

This observational descriptive survey was approved by the Colorado Multi-Institutional Review Board (COMIRB no. 14-0938). Patients were consented and then surveyed one on one by

Table 1. Patient Characteristics

Characteristic	Study Sample (N = 61)
Age, y, mean ± SD	59 ± 12
Female sex	24 (39%)
Born in Mexico	55 (90%)
Undocumented immigrant	19 (31%)
Charlson Comorbidity Index, mean ± SD	6.5 ± 2.5
Hemodialysis vintage, mo, mean ± SD	43.3 ± 44.8
Married or living with significant other[a]	29 (48%)
Education	
<Middle school	40 (66%)
<High school	4 (7%)
Finished high school	17 (28%)
Income below poverty line for 2-person household	45 (74%)
Employed	9 (15%)
Interview conducted in Spanish	47 (77%)
Rate their English as poor: "I do not speak English at all" or "a few words"	46 (75%)

[a]Versus single, separated, divorced, or widowed.

L.C. in the patient's preferred language (Spanish or English) during dialysis using a modified version of Davison's survey that explores EOL care preferences and needs.[2] We pilot tested the translated and modified survey for construct validity; we used SAS Enterprise Guide 5.1 to summarize descriptive statistics.

We surveyed 61 participants between September and December 2014. Participants represented >50% of 69 eligible patients receiving scheduled dialysis at 2 outpatient dialysis centers and 40% of 50 eligible patients without access to routine dialysis who receive emergent-only dialysis at the safety-net hospital. Participant characteristics are given in Table 1.

Patient-rated EOL care elements and preferences are reported in Table 2. The majority of participants want to discuss their physical symptoms (89%) and quality of life (QoL; 95%), be informed about prognosis (98%), and be prepared and plan ahead for EOL care (90%), yet most reported no EOL discussion with their nephrologist (84%) or family (71%). The majority of participants preferred to have EOL conversations early after dialysis therapy initiation but before becoming ill (85%), on a routine basis (87%), and during a dialysis session (48%) or at home (38%). Latinos rely on family and friends for social and emotional support (87%), choose family to make medical decisions (95%), and want to have family actively involved in medical decision making (93%). The majority (70%) would prefer resuscitation if their heart stopped and few (15%) regret the decision to start dialysis therapy.

Our results show important similarities to primarily English-speaking and white Canadian patients with CKD.[2] Both groups want to discuss their symptoms and QoL, be informed about prognosis, and be prepared and plan ahead in case of death; however, few have discussed EOL care with their nephrologist or family. Timing was different in the Canadian cohort, who preferred that EOL conversations occur when seriously ill or when the need arises and in a clinic or in a private room during dialysis.[2] Our findings suggest that Latinos prefer these conversations to occur before serious illness occurs and many want these discussions to take place at home. This may be a culturally appropriate option that would allow for meaningful integration of family into medical decision making. We observed a preference toward more aggressive care, which differs from the Canadian cohort, in which fewer patients stated a preference for resuscitation (38.9%) and many (60.7%) regretted the decision to start dialysis therapy. The

Table 2. End-of-Life Care Elements and Preferences

End-of-Life Care Elements

How important is it for you….	Extremely or Somewhat Important	Unsure	Extremely or Somewhat Unimportant
To be informed about your prognosis?	60 (98%)	0 (0%)	1 (2%)
To receive detailed information about your medical condition?	59 (97%)	1 (2%)	1 (2%)
To be informed about treatment options such as withdrawing from dialysis?	53 (87%)	1 (2%)	7 (12%)
To have your physical symptoms (eg, pain, nausea) treated by nephrology staff?	54 (89%)	3 (5%)	4 (7%)
To be prepared and plan ahead?	55 (90%)	2 (3%)	4 (7%)
To have access to information on alternative ways to manage your physical symptoms (eg, traditional medicine)?	42 (69%)	2 (3%)	17 (28%)
For your family to be actively involved in medical decision making?	57 (93%)	0 (0%)	4 (7%)
For your "quality of life" responses to affect your future care?	58 (95%)	2 (3%)	1 (2%)
To discuss your "quality of life" regularly with our nephrology staff?	58 (95%)	1 (2%)	2 (3%)
To have your social, psychological, or spiritual concerns attended to by nephrology staff?	54 (89%)	3 (5%)	4 (7%)

End-of-Life Care Preferences

Question	No. (%)
Who is your primary caregiver?	
- Family	58 (95)
- Other	0 (0)
- No one	3 (5)
Who do you rely on for social and emotional support during your illness and treatments?	
- Family	53 (87)
- Friends	9 (15)
- Physician or physician assistant	6 (10)
- Nurse	5 (8)
- Hospital support counselor	1 (2)
- Spiritual advisor or curandero	2 (3)
- Other	3 (5)
- None	4 (7)
If you are physically or mentally unable to make a decision yourself, who would you choose to make decisions about your medical care for you?	
- Family	58 (95)
- Friends	1 (2)
- Physician or physician assistant	0 (0)
- Other	1 (2)
How comfortable are you in discussing end-of-life issues with family members?	
- Very/somewhat comfortable	50 (82)
- Unsure	3 (5)
- Very/somewhat uncomfortable	8 (13)

(Continued)