

Research Article

Chronic Kidney Disease in Hispanic Population in US: A Public Health Research Gap

Shyam Chirravoori* 

Department of Integrated Health Sciences, College of Health Professions, University of Texas Rio Grande Valley, Edinburg, USA

Abstract

Hispanic population is very fast growing in the United States of America. The incidence and prevalence of End Stage Renal Disease (ESRD) in Hispanics is higher than that of non-Hispanic Whites. The Hispanics with Chronic Kidney Disease (CKD) are at a greater risk for kidney failure. The main contributing factors for this higher burden of chronic kidney disease are diabetes, and metabolic syndrome. Both diabetes and metabolic syndrome are common in Hispanics. In addition, Health care access, quality of health care, language barrier, health literacy, low socioeconomic status, life style etc., may further contribute to the increased disease burden of CKD in the Hispanic population in the United States of America. Despite the recognition of public health importance of the problem, there is very little data about Hispanics with CKD. Rio Grande Valley (RGV) is a very important hub for Hispanics and an appropriate geographic place to study the CKD problem due to various reasons. A review of the literature on CKD and other issues in Hispanic population in US is ascertained using PubMed and Google scholar. Even when the issues and contexts are well appreciated there are paucity of valid data on the subject. Research on CKD including ESRD in Hispanics may be reassessed in RGV.

Keywords

Hispanics, CKD, ESRD, RGV, Review of Literature

1. Introduction

Hispanic population is very fast growing in the United States of America. The incidence and prevalence of End Stage Renal Disease (ESRD) in Hispanics is higher than that of non-Hispanic Whites. The Hispanics with Chronic Kidney Disease (CKD) are at a greater risk for kidney failure. The main contributing factors for this higher burden of chronic kidney disease are diabetes, and metabolic syndrome. Both diabetes and metabolic syndrome are common in Hispanics. Health care access, quality of health care, language barrier, health literacy, low socioeconomic status, life style etc., may

further contribute to the disease burden. In spite of the fact that the importance of the public health problem is well recognized, there is hardly any data about Hispanics with CKD. There is a clear-cut research gap there.

Rio Grande Valley is a very important hub for Hispanics and an appropriate place to study the CKD problem due to the following facts. Hispanic population in the RGV is more than twice the state average, with approximately up to 90% of the population identifying as Hispanic [1]. The percent of Older Adults living below FPL (Federal Poverty Level) in the Val-

*Corresponding author: shyamchirravoori@yahoo.com (Shyam Chirravoori)

Received: 26 December 2024; **Accepted:** 20 January 2025; **Published:** 10 February 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

ley is more than twice that of Texas. The uninsured People in the Valley (Ages 45 to 64) is about 36% [2].

2. Materials and Methods

A review of the literature on CKD and other issues in Hispanic population in US is ascertained using PubMed as well as Google scholar to review as many articles as possible.

3. Results & Discussion

A review of the literature regarding prior work on CKD and other issues in Hispanic population reveals that the relevance is well recognized, enough work with adequate rigor has not been done due to, probably, feasibility problems.

In a review on CKD and ESRD in US Hispanics, Desai et al. say though prevalence of CKD is more or less similar or slightly lower in Hispanics compared with non-Hispanic whites, the age- and sex-adjusted prevalence rate of ESRD is about 50% higher in Hispanics compared with non-Hispanic whites. This may be partly due to faster progression of CKD among Hispanics. In addition, Hispanic ethnicity is associated with a greater prevalence of obesity and diabetes, as well as CKD-related complications. In spite of their lower socioeconomic status and limited access to quality health care, and Hispanics higher comorbid conditions, the mortality among Hispanics is apparently is lower than that of non-Hispanic whites. This survival paradox is well recognized, and probably attributable to a complex interplay of sociocultural and psychosocial factors, and other unknown factors. Further research should focus on evaluating the long-term impact of these factors on disease progression and clinical outcomes. National policies need to be developed for better access to quality health care to Hispanics with CKD [3].

In a cross-sectional study entitled, "Smoking patterns and chronic kidney disease in US Hispanics: Hispanic Community Health Study/Study of Latinos", Franceschini et al. conclude that their findings of increased risk of CKD among Hispanics who are intermittent smokers support screening and smoking cessation interventions targeted to this population for the prevention of CKD. They also suggest that novel mechanisms or pathways for kidney toxicity due to smoking should be explored in future studies [4].

This study has limitations such as cross-sectional design, self-reported smoking status and single measurements of albuminuria and kidney function etc. However, relationship between smoking and CKD progression needs evaluation.

Leal et al. evaluated the ability of a pharmacist-based disease-state management service to improve the needy Spanish speaking patients of diabetes with comorbidities and at risk of CKD development. They report that this management service achieved a lower CKD risk in their patients of diabetes due to enhanced quality of care [5].

Swift et al. in their findings from the Hispanic Community

Health Study/Study of Latinos, 2008-2017, conclude that diets with lower potassium and higher sodium quantities are associated with greater risk of chronic kidney disease among healthy US Hispanic/Latino adults [6].

In a pilot study on chronic kidney disease of unknown origin in Hispanic outdoor workers, Figueroa-Solis et al. conclude that Implementation of (Disadvantaged Populations eGFR Epidemiology) DEGREE protocol and the new CKDu questionnaire module was straightforward and well understood. The POC (Point Of Care) creatinine testing device performed well in the field, with some adjustment in methods when temperature readings were out of range [7].

In the pilot study, number of subjects was low and hence it may be tried in a larger population as it was easy and feasible to conduct the study to evaluate its utility.

Loannidou et al found an increase of periodontitis prevalence with decreased kidney function in Mexican American population [8]. Toth-Manikowski et al. in an observational cohort of Hispanic Community Health Study/Study of Latinos found that certain measures of periodontal disease were associated with cases of low eGFR [9].

In view of the above two studies and in view of predominant Hispanic population in the Valley, it may be appropriate to repeat the study to validate findings of the above researchers.

Porter et al in a review on Health-related quality of life in Hispanics with chronic kidney disease, discusses the measurement of HRQOL in CKD [10].

Since, not much information on this subject is available in general, the research on this topic is needed, relevant, and feasible to do in the Valley.

Gadegbeku, in a review on racial disparities in renal replacement therapy, discusses and emphasizes on the need for developing strategies to address the disparities in ESRD treatment among minority groups in order to lessen the differences in Renal Replacement Therapy provision and identify the factors that confer better dialysis survival [11].

Lora et al in a research report on Recruitment of Hispanics into an Observational Study of Chronic Kidney Disease: The Hispanic Chronic Renal Insufficiency Cohort Study Experience, describe several barriers for recruitment of study participants and various strategies to overcome for a successful recruitment into the cohort [12].

Laster et al observe in a comparative study that there are racial-ethnic differences in the markers of Mineral Bone Metabolism (MBM). Higher PTH is seen in African-American and Hispanic children and young adults on dialysis and that this difference is more pronounced in the female population. The impact of factors such as race, ethnicity and gender in the goal-targeted treatment of MBM disorders needs to be noted [13].

Quinibi et al in a cross-sectional study observe that Coronary Artery Calcification and Peripheral Artery Calcification are common and severe in Hispanic American diabetic patients with CKD that were not previously treated with dialysis,

calcium-based phosphate binders, or vitamin D analogues. Lower level of renal function is associated with increased burden of vascular calcification in pre-dialysis patients with CKD [14]. Only 58 subjects were there in the study and may be validated in a larger Hispanic population.

Lora et al. in their research report on Progression of CKD in Hispanics: potential roles of health literacy, acculturation, and social support, discuss the need to study the role of characteristics such as interpersonal and patient-centered including health literacy, acculturation, and social support in the context of CKD, especially in relation to disease knowledge, attitudes, and behaviors. They also propose targeted therapeutic interventions [15].

Fischer et al. in a cross-sectional study conclude that Hispanics with CKD in the CRIC/H-CRIC Studies are disproportionately of lower socioeconomic status, more frequently of diabetes, lesser usage of ACE-inhibitor/ARB, of poorer blood pressure control, and more severe CKD associated complications compared to their non-Hispanic counterparts [16]. This study is limited by non-generalizability.

The Hispanics, as an ethnic group are heterogeneous, with distinct genetic, cultural, and socioeconomic characteristics and hence Frankenfield et al. examined survival differences of various Hispanic subgroups. Mexican-American and Hispanic-other dialysis patients have a survival advantage compared with non-Hispanics on dialysis. However, there are differences between the subgroups of Hispanics also [17]. The limitations of the study include inherent problems of observation study and small sample size. The authors also mentioned potential misclassification of Hispanic subgroups.

On the whole, even when the issues and contexts are well realized and appreciated there are paucity of data due to various factors such as feasibility, recruitment of subjects, and sample size etc. In the case of CKD, for example, many research questions are possible from normal kidney function to the applicability of currently used equations of eGFR in Hispanics, access to quality care problems to policy and implementation issues.

4. Conclusion

Research on CKD in Hispanics should include studies on the prevalence, risk factors assessment etc., at the community level. Other areas include study of renal parameters, GFR profiles both in normal individuals and diseased populations and related physiological studies, the applicability and validation in the Hispanic population of the various existing mathematical formulae/equations as well as the nomograms to estimate GFR, estimate the profile of CKD at various stages, with special reference to pre-ESRD in the community. In the case of ESRD in Hispanics, the availability, access, and cost effectiveness of available renal replacement are some of the aspects needing immediate attention in the Valley, as the

Valley is a very appropriate geographic place to verify, study or validate some of these research questions in the Hispanic Population.

Abbreviations

CKD	Chronic Kidney Disease
DEGREE	Disadvantaged Populations eGFR Epidemiology
ESRD	End Stage Renal Disease
MBM	Mineral Bone Metabolism
HRQOL	Health-related Quality of Life
POC	Point of Care
RGV	Rio Grande Valley

Author Contributions

Shyam Chirravoori is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] La Fe Policy Research and Education Center. Texas Lower Rio Grande Valley Factsheet. Available from: <https://lafe-ep.org/wp-content/uploads/2017/06/lrgv-senior-12-09-2.pdf> (accessed 19 December 2024)
- [2] La Fe Policy Research and Education Center. Profiles: Latino Health Insurance Coverage in Texas. Available from: https://lafe-ep.org/wp-content/uploads/2017/06/tx-uninsured-charts-2002_11.pdf (accessed 19 December 2024)
- [3] Desai N, Lora CM, Lash JP, Ricardo AC. CKD and ESRD in US Hispanics. *Am J Kidney Dis.* 2019 Jan; 73(1): 102-111. <https://doi.org/10.1053/j.ajkd.2018.02.354> Epub 2018 Apr 13
- [4] Plantinga L, Gander JC. Intermittent smoking and chronic kidney disease. *Nephrol Dial Transplant.* 2016 Oct; 31(10): 1558-60. <https://doi.org/10.1093/ndt/gfw207> Epub 2016 May 26.
- [5] Leal S, Soto M. Chronic kidney disease risk reduction in a Hispanic population through pharmacist-based disease-state management. *Adv Chronic Kidney Dis.* 2008 Apr; 15(2): 162-7. <https://doi.org/10.1053/j.ackd.2008.01.007>
- [6] Swift SL, Drexler Y, Sotres-Alvarez D, Raij L, Llabre MM, Schneiderman N, Horn LV, Lash JP, Mossavar-Rahmani Y, Elfassy T. Associations of sodium and potassium intake with chronic kidney disease in a prospective cohort study: findings from the Hispanic Community Health Study/Study of Latinos, 2008-2017. *BMC Nephrol.* 2022 Apr 6; 23(1): 133. <https://doi.org/10.1186/s12882-022-02754-2>

- [7] Figueroa-Solis E, Gimeno Ruiz de Porras D, Delclos GL. Pilot study determining the feasibility of implementing the Disadvantaged Populations eGFR Epidemiology Study (DEGREE) protocol, point-of-care field measurements and a new module on risk factors for chronic kidney disease of unknown origin in Hispanic outdoor workers. *BMC Nephrol*. 2021 Mar 12; 22(1): 88. <https://doi.org/10.1186/s12882-021-02288-z>
- [8] Ioannidou E, Hall Y, Swede H, Himmelfarb J. Periodontitis associated with chronic kidney disease among Mexican Americans. *J Public Health Dent*. 2013 Spring; 73(2): 112-9. <https://doi.org/10.1111/j.1752-7325.2012.00350.x> Epub 2012 Jul 6.
- [9] kowski SM, Ricardo AC, Salazar CR, Chen J, Khambaty T, Liu J, Singer RH, Youngblood ME, Cai J, Kaste LM, Daviglus ML, Lash JP. Periodontal Disease and Incident CKD in US Hispanics/Latinos: The Hispanic Community Health Study/Study of Latinos. *Kidney Med*. 2021 Jul 3; 3(4): 528-535. e1. <https://doi.org/10.1016/j.xkme.2021.02.015>
- [10] Porter AC, Vijil JC Jr, Unruh M, Lora C, Lash JP. Health-related quality of life in Hispanics with chronic kidney disease. *Transl Res*. 2010 Apr; 155(4): 157-63. <https://doi.org/10.1016/j.trsl.2009.10.005> Epub 2009 Nov 14.
- [11] Gadegbeku C, Freeman M, Agodoa L. Racial disparities in renal replacement therapy. *J Natl Med Assoc*. 2002 Aug; 94(8 Suppl): 45S-54S.
- [12] Lora CM, Ricardo AC, Brecklin CS, Fischer MJ, Rosman RT, Carmona E, Lopez A, Balaram M, Nessel L, Tao KK, Xie D, Kusek JW, Go AS, Lash JP. Recruitment of Hispanics into an observational study of chronic kidney disease: the Hispanic Chronic Renal Insufficiency Cohort Study experience. *Contemp Clin Trials*. 2012 Nov; 33(6): 1238-44. <https://doi.org/10.1016/j.cct.2012.07.012> Epub 2012 Jul 27.
- [13] Laster M, Soohoo M, Streja E, Elashoff R, Jernigan S, Langman CB, Norris KC, Salusky IB, Kalantar-Zadeh K. Racial-ethnic differences in chronic kidney disease-mineral bone disorder in youth on dialysis. *Pediatr Nephrol*. 2019 Jan; 34(1): 107-115. <https://doi.org/10.1007/s00467-018-4048-6> Epub 2018 Sep 29
- [14] Qunibi WY, Abouzahr F, Mizani MR, Nolan CR, Arya R, Hunt KJ. Cardiovascular calcification in Hispanic Americans (HA) with chronic kidney disease (CKD) due to type 2 diabetes. *Kidney Int*. 2005 Jul; 68(1): 271-7. <https://doi.org/10.1111/j.1523-1755.2005.00402.x>
- [15] Lora CM, Gordon EJ, Sharp LK, Fischer MJ, Gerber BS, Lash JP. Progression of CKD in Hispanics: potential roles of health literacy, acculturation, and social support. *Am J Kidney Dis*. 2011 Aug; 58(2): 282-90. <https://doi.org/10.1053/j.ajkd.2011.05.004>
- [16] Fischer MJ, Go AS, Lora CM, Ackerson L, Cohan J, Kusek JW, Mercado A, Ojo A, Ricardo AC, Rosen LK, Tao K, Xie D, Feldman HI, Lash JP; CRIC and H-CRIC Study Groups. CKD in Hispanics: Baseline characteristics from the CRIC (Chronic Renal Insufficiency Cohort) and Hispanic-CRIC Studies. *Am J Kidney Dis*. 2011 Aug; 58(2): 214-27. <https://doi.org/10.1053/j.ajkd.2011.05.010> Epub 2011 Jun 25.
- [17] Frankenfield DL, Krishnan SM, Ashby VB, Shearon TH, Rocco MV, Saran R. Differences in mortality among Mexican-American, Puerto Rican, and Cuban-American dialysis patients in the United States. *Am J Kidney Dis*. 2009 Apr; 53(4): 647-57. <https://doi.org/10.1053/j.ajkd.2008.10.049> Epub 2009 Jan 15.