

## RESEARCH LETTER

## In-Center Hemodialysis Symptom Burden: Differences Between Men and Women



To the Editor:

Patients with kidney failure (KF) requiring hemodialysis often struggle with troublesome symptoms that significantly impact quality of life. Despite women having longer life expectancy compared with men in the general population, among patients with KF, female patients often have poorer survival.<sup>1</sup> This disparity suggests underlying differences in disease mechanisms, which could influence the symptomatic experiences of these patients. We sought to examine gender differences in symptoms among patients with KF receiving in-center hemodialysis.

We analyzed data from the Timing of Antihypertensive Medications on Key Outcomes in Hemodialysis (TAKE-HOLD) study, a cluster randomized trial that examined timing of blood pressure medications on the occurrence of intradialytic hypotension.<sup>2</sup> The study was approved by a Stanford Institutional Review Board (IRB) panel (protocol 43790), was adherent to the Declaration of Helsinki, and was registered on [clinicaltrials.gov](https://clinicaltrials.gov) (NCT03327909). All patients were receiving in-center hemodialysis. We categorized each patient's gender as woman or man based on self-identification. During the baseline period, participants completed the Dialysis Symptoms Index (DSI), a validated 30-question survey that assesses symptoms experienced in the prior week.<sup>3</sup> In the Dialysis Symptoms Index, patients rated whether they experienced the symptom, and if so, how much that symptom bothered them on a scale of 1 ("not at all") to 5 ("very much"). Total Dialysis Symptoms Index scores range from 0 to 150 with lower scores indicating fewer symptoms experienced or lower severity of symptoms. We compared proportions of women and men with symptoms using absolute risk differences (ARDs). In participants with each symptom, we compared differences in mean severity scores.

We had information on 127 participants, of whom 36% (N = 46) were women and 64% (N = 81) were men. Baseline characteristics were similar between women and men (Table 1). Overall symptom burden as determined by total Dialysis Symptoms Index score was numerically higher in women (median 28, interquartile range [IQR] 12.5-57.3) than men (median 24, IQR 13.0-41.0), although the difference was not statistically significant (P = 0.24). The proportion of women experiencing symptoms was often higher than men and severity of symptoms was often higher for women than men (Fig 1, Table S1). In particular, women were significantly more likely to report headaches (ARD 28.0%; 95% confidence interval [CI], 11.3%-44.9%), shortness of breath (ARD 18.1%; 95% CI, 1.4%-34.7%), and dry skin (ARD 18.3%; 95% CI, 0.8%-35.8%). Conversely, men were more likely to report decreased sexual arousal (ARD 19.1%; 95% CI,

5%-33.2%). However, among women reporting decreased sexual arousal, their mean severity scores were slightly higher than in men (absolute difference in means 0.5; 95% CI, 0.9 to 2.0).

Our results show gender differences in symptoms experienced by patients with KF receiving in-center hemodialysis. Women generally reported a larger number of symptoms that were of greater severity than men. In particular, they reported more headaches, shortness of breath, and dry skin, whereas men were more likely to report decreased sexual arousal. However, even when a lower proportion of women reported the presence of a given symptom, they often found it to be of greater severity than men.

Our findings confirm prior studies showing that women tend to have a higher prevalence and intensity of symptoms compared with men and perceive a higher negative impact of hemodialysis on their quality of life.<sup>4</sup> Numerous factors may influence the symptoms experienced by women and men undergoing hemodialysis, including diagnosed depression and physiological distinctions in cardiac and vascular function, blood volume, and the effects of factors like fluid removal and solute clearance during dialysis.<sup>5</sup> Additionally, underlying

**Table 1.** Baseline characteristics by gender<sup>a</sup>

	Women N = 46	Men N = 81
Demographics		
Age, y, mean ± SD	62.7 ± 14.3	60.6 ± 13.7
Race		
Asian	10 (21.7)	24 (29.6)
African American	2 (4.3)	4 (4.9)
White	26 (56.5)	40 (49.4)
Other or prefer not to say	8 (17.4)	13 (16.0)
Hispanic ethnicity	21 (45.7)	45 (55.6)
Vintage, y, median [Q1,Q3]	2.4 [1.4, 4.3]	2.9 [1.3, 5.3]
Private insurance	6 (13.0)	9 (11.1)
Currently employed	7 (15.2)	14 (17.3)
Cause of kidney failure		
Diabetes mellitus	28 (60.9)	47 (58.0)
Hypertension	9 (19.6)	16 (19.8)
Glomerulonephritis	2 (4.3)	3 (3.7)
Other/Not Specified	7 (15.2)	15 (18.5)
Comorbid conditions		
Heart failure	9 (19.6)	20 (24.7)
Cardiovascular disease	13 (28.2)	20 (24.7)
Diabetes mellitus	36 (78.3)	57 (70.4)
Unable to ambulate and/or needs assistance with activities of daily living	11 (23.9)	24 (29.6)
Laboratory results		
Hemoglobin level, g/dL, mean ± SD	10.3 ± 1.0	10.7 ± 1.3
Albumin level, g/L, mean ± SD	3.8 ± 0.3	4.0 ± 0.3
Kt/V, mean ± SD	1.67 ± 0.22	1.49 ± 0.19

<sup>a</sup>All values are N (%) except where indicated.



**Figure 1.** Proportion of patients with the specified symptoms and the average symptom severity score by gender. Abbreviations: Dec, decreased.

hormonal differences and the impact of KF on the endocrine system could play a role.<sup>6</sup> Medications used to treat comorbid conditions, such as hypertension and diabetes, may result in different side effect profiles in men than women, and the prescription and effectiveness of medications to treat dialysis-related symptoms may also vary by gender.<sup>7</sup> Finally, other gender-specific factors, including access to care, differences in coping mechanisms, and the perception and reporting of symptoms, could further contribute to the observed variations.<sup>8</sup>

Despite the insights gained from this study, we acknowledge certain limitations. We recognize that our research did not consider gender nonbinary or gender fluid individuals. Our research may also be affected by under or overreporting of symptoms, which may occur differently in women and men, and we did not have information on medications used to treat symptoms. The cross-sectional nature of this data prevents making inferences about causation. Additionally, the sample size precluded examination of the impact of race, ethnicity or English proficiency on the results, and the generalizability of our findings may be influenced by specific demographic and clinical characteristics of the participants.

In conclusion, our research sheds light on gender differences in symptom experiences among patients receiving hemodialysis. Both men and women frequently report symptoms, and women generally had a higher burden of symptoms that were of greater severity compared with men. These findings underscore the

importance of addressing symptom burdens in all patients receiving hemodialysis and consider gender-specific aspects in the management of certain hemodialysis-related symptoms.

*Georgia Parsons, MBBS, Sai Liu, MPH, and Tara I. Chang, MD, MS*

## SUPPLEMENTARY MATERIALS

### Supplementary File (PDF)

**Table S1:** Proportions of Women and Men with the Specified Symptom and the Absolute Difference (95% Confidence Interval [CI]) and the Mean Severity Scores among Participants with the Specified Symptoms and the Absolute Difference (95% CI) between Women and Men.

## ARTICLE INFORMATION

**Authors' Affiliations:** Department of Medicine, Division of Nephrology, Stanford University School of Medicine, Stanford, CA (GP, SL, TIC).

**Address for Correspondence:** Tara I. Chang, MD, MS, Stanford Division of Nephrology, 3180 Porter Drive, Palo Alto, CA 94304. Email: [tichang@stanford.edu](mailto:tichang@stanford.edu)

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