Vascular Access Differences in Men and Women: Time to Solve the Problem?

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The paper by Shah et al. [1] describes disparities in hemodialysis (HD) access and outcomes according to race and sex. Using data from the United States Renal Data System between 2004 and 2014 and multivariable regression models adjusted for health prior to dialysis, they were able to describe that women were less likely than men to use arteriovenous (AV) access at HD initiation. Using Caucasians as the reference group, blacks and Asians were more likely to have AV access and Hispanics less likely at dialysis initiation.

The thorough analysis considers several factors that may impact AV access at dialysis initiation. These include variables such as (a) care prior to dialysis, (b) functional status, (c) education, (d) comorbidities, (e) employment status, and (f) laboratory parameters. A unique feature of the study is that it not only addresses a comprehensive and diverse racial and ethnic group of patients, both women and men, but the 10-year period adds to understanding the natural history. Sadly, central venous catheters remain the predominant HD access, used in over 80% of patients starting dialysis. Moreover, women initiating dialysis, despite being younger and more frequently

employed and insured, are more likely to be obese, have diabetes as well as heart failure, than men. However, women were also more likely to have poor functional status with major laboratory abnormalities, that is, lower albumin and hemoglobin values.

The frequency of AV access was statistically lower in women (16%) vs. men (18%). The authors were able to adjust for several factors and established a 15% adjusted odds ratio of women being less likely to start HD with an AV access than men. Across races, Asian women had highest rates, followed by blacks, Native Americans, Caucasians, and Hispanics. There were no significant race and sex interactions.

This paper is concordant with other publications, which describe lower adjusted odd ratios of AV access in women as compared to men. Since the authors were able to adjust for many factors which may influence AV access creation in a timely manner, the adjusted odds ratio is lower than other studies (25–30%) but persists nonetheless. The authors do offer several possible contributors to the findings that include surgical technique issues, referral, transition practices, and later recognition of severity of chronic kid-

ney disease (CKD) due to lower muscle mass. In addition, the possibility that patient preferences such as fear of needles and cosmetic disfigurement may contribute to the findings is offered. These factors can be grouped into biological issues, health care system or community issues, psychosocial issues. In any one individual, multiple factors may be at play. Of course, due to the observational nature of the study, and the sources of data, many of these hypotheses to account for the disparity in AV access at dialysis initiation, cannot be tested in this data set.

The issue of race and sex disparity in health care is well recognized and has been called out in recent publications specific to nephrology, most recently during the 2018 World Kidney Day campaign [2, 3], which coincided with International Women's Day. The focus of this editorial is to further contextualize the findings of the Shah et al. [1] within a broader framework.

It is important to have an improved understanding of women and kidney disease outcomes, and the study by Shah et al. [1] calls attention to an important intercurrent "outcome" that adversely impacts long-term outcomes. The use of catheters instead of AV fistula to initiate dialysis is consistently associated with poor outcomes such as infection, hospitalization, and mortality [4, 5]. Thus, as this study notes, in the United States, women continue to be exposed to this increase risk, more so than men, because of a sustained lack of ability for us as a nephrology community, to change attitudes of patients and physicians. This failure to change attitudes and approach leave women further disadvantaged. A change in approach would culminate in more AV access rather than catheters used at dialysis initiation correct this discrepancy.

In addition, the finding that women were more likely to have heart failure, diabetes, and obesity, as compared to men, begs the question of access to preventive care and lifestyle issues, as well as biological differences in the presentation and treatment of heart disease in women. It is well described that usual risk assessment for cardiovascular disease, in both men and women, are inadequate in those with CKD [6]. Thus, without good tools, and differential identification, it may not be surprising that women present with more heart failure symptomology. One could ask the question, are frailty, functional status, and poor laboratory parameters a function of access to care, delayed treatment, or biological manifestations of advanced kidney disease?

The opportunity to reflect on the importance of women's health and kidney specific issues has been highlighted in a comprehensive way in the editorials for World Kidney Day 2018 [3]. Women child-bear and child-rear,

they are major contributors to sustaining family and community health. Worldwide, access to education and medical care is not equitable amongst men and women, and the impact of this on health outcomes is profound. Pregnancy, autoimmune diseases, CKD, dialysis, and transplantation present specific challenges for women, and remain understudied [7–10].

Women have unique risks for kidney diseases, and a biological milieu which differs from men. In the era of "Precision Medicine", recognition of potential learnings by studying biological differences in disease presentation, outcome, and response to therapy between sexes should be a focus. Advocating for inclusion of sex and gender in all studies may lead to new discoveries, and the tailoring of therapies to specific biological states.

The current study by Shah et al. [1] further confirms the ongoing disparity in one aspect of renal care, vascular access creation. However, it leaves us as a nephrology community still questioning why this occurs, and how to fix it. The World Health Organization has described an approach to sex, gender, and primary care access: it may be of value to reflect now on sex, gender, and specialty care access [10].

It would be an amazing step forward to first publish and then execute a research agenda to address this specific issue. Moving the field forward, having described the problem as important and persistent, will require an integrated physiological, translational, epidemiological, and implementation science set of research questions. The paper by Shah et al. [1] reminds us that it is time to answer those questions. We should be up for the challenge because the understanding of differential outcomes in women with kidney diseases may have a profound impact on both the current and next generations.

References

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