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Exploring Female Underrepresentation in Heart Failure Research

Dr. Sorrentino:
Even though the cardiology field has seen growing diversity and representation over the last few years, female-led research remains limited. In the branch of advanced heart failure and transplant cardiology, only a quarter of physicians and researchers are women. To learn more about this glaring disparity, today we're going to be speaking with one of the pioneers within the field, who's researching the topic of gender parity in heart failure research.

For ReachMD, this is Heart Matters, and I'm Dr. Matthew Sorrentino. Joining me today is Dr. Nosheen Reza, an Instructor of Cardiovascular Medicine and Advanced Heart Failure and Transplant Cardiology at the University of Pennsylvania's Perelman School of Medicine. Dr. Reza, welcome to Heart Matters.

Dr. Reza:
Thank you so much.

Dr. Sorrentino:
Before we dive into your recent paper, Dr. Reza, can you tell us how you became interested in exploring gender disparities in the heart failure research area?

Dr. Reza:
Absolutely. As I entered the field of cardiology as a general cardiology fellow a few years ago, I became acutely aware of the low numbers of women physicians in cardiovascular medicine and practice. So at my own home institution, there were actually a higher number of women cardiologists on staff in the fellowship programs compared to what I saw across the country and national averages. I became inspired to harness this collective knowledge and experience and potential for mentorship and sponsorship, and I started the Penn Women in Cardiology, which is a group of women fellows and faculty, working to advance the careers of women cardiologists throughout the career span. So after my general fellowship, and being involved in Women in Cardiology at that stage, I went on to pursue additional training at Penn in advanced heart failure and transplant cardiology, in large part because of the strong female mentorship and sponsorship that I had been fortunate to have at Penn. So when I sort of got into the heart failure fellowship and continued this theme of being passionate about advancing the careers of women in cardiology, I started to look at more of the data. And when you look at the breakdown, in terms of demographics, of trainees in advanced heart failure and transplant cardiology, I think you'd notice that there are significantly more women in this cardiology subspecialty; according to the recent AAMC data, it's about 30% of trainees in the last year were women, in advanced heart failure and transplant cardiology. But then you compare this to other cardiology subspecialties, like cardiac electrophysiology and interventional cardiology, where women comprise less than 10% of the total number of trainees in the United States, and you kind of start to get a sense, and wonder what the difference is there. So over the last few years, more and more data have emerged about the underrepresentation of women in academic medicine, as you mentioned, and in cardiology research specifically, so I became curious to find out whether this higher number of women in heart failure practice that we were seeing in the United States and across the world has actually translated to the representation of women in heart failure research.

Dr. Sorrentino:
So you mentioned the disparities in academic medicine, and I presume that also means in our training programs. Is there any data to suggest that this is across the board in cardiology, even in private practice? Is this still a field that attracts more men, or are there barriers to women even going into cardiology from the beginning?

Dr. Reza:
So, as we've seen over the last few years, there are more and more women entering medical school, and in internal medicine residency

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programs, the data that we've seen over the last few years have shown us that the gender breakdowns of men and women in internal medicine residency programs is approaching equal – 50/50. And so then, when you get to the internal medicine subspecialty stage, and sort of looking at where women trainees choose to pursue advanced training and fellowships after internal medicine residency, that's what we call, "the cliff." So you really see a significant drop-off in the number of women that choose to pursue cardiology training. On average, 12-14% of practicing cardiologists in the United States are women. And then, if you want to get a sense of what the trainee landscape is looking like, about 20% of women make up general cardiology fellowship trainees. That number really has not changed over the last two decades. And then, looking more the cardiology subspecialties, there is again another "cliff," where you see, especially for the procedural subspecialties of cardiology, the numbers of women trainees really dropping off to that less-than-10% range.

Dr. Sorrentino:
Well, with that background in mind, let's zero in on your recent study in Circulation: Heart Failure. What were you attempting to look at in this recent study?

Dr. Reza:
So we set out with the goal to study the body of work that influences clinical heart failure practice and care today. So we thought that one interesting and novel way to approach this question would be to: #1, examine the authorship of the publications that support the Class I recommendations and major society heart failure practice guidelines; and #2, examine the authorship of recent pivotal contemporary heart failure clinical trials, as both of these sets of publications are most often used to support guideline recommendations and heart failure practice as we do it today. We focused on the metric of publication authorship position, and we looked at individuals who are first and senior authors. So, we hypothesized that women are underrepresented as both leaders of, and as participants in, this work that heavily influences worldwide clinical practice. So, sort of zooming in on the actual study design, for the first part of the analysis – we'll call it the Heart Failure Guidelines Analysis – we identified all unique publications that were cited in the Class I recommendations in the 2013 ACC/AHA Heart Failure Guidelines, the 2017 ACC/AHA Heart Failure Guidelines, and the 2016 ESC Heart Failure Guidelines. We looked at author order as displayed, to determine the first, middle and senior authorship positions, and then we extracted some metadata including author first and last name, article title, publication journal and the publication year. And then for part two, our Heart Failure Clinical Trial Analysis, we identified all heart failure clinical trials that were published between January, 2001 and December, 2016. To identify gender of the authors, we used a specific gender and name matching algorithm. And then, on these two data sets, we essentially performed descriptive statistics to describe the proportions and numbers of women as authors in these different authorship positions, in both the guideline and clinical trial publications, evaluated the trends in authorship over time, and then tried to evaluate for any predictors of the enrollment of women participants in the clinical trials.

Dr. Sorrentino:
So now that you've told us about how the trial was put together, we're real excited to hear what you found. What did you find from looking at the guidelines and the clinical trials?

Dr. Reza:
So, from the Heart Failure Guidelines citation data set, we found that overall proportions of women as first authors in the United States and the European Guidelines were 18% and 16%, respectively. And, if you look at last authors, again for the United States and European Guidelines, that was 13% and 12%, respectively. From 1986 to 2016, percent women authorship just modestly increased in both the United States and European guideline citations, telling us that there was a hopeful signal that the number of women participating as authors on these publications has been increasing over time. Percent woman authorship, though, was lower in the ESC Guideline citations, as compared with ACC/AHA. That number was about 14% in ESC, compared to about 20% in the ACC/AHA, so there was a bit of a discrepancy across the major society heart failure guidelines.

So then, moving on to the heart failure clinical trials data set, we found that 16% of the publications that we examined had a woman as first or senior author. Women were first author of about 10% of trial publications, and were only senior authors on 8% of these trial publications. The median proportion of women first and senior authors per trial was 11%, and this really did not change significantly over the 15 years that we examined. And also of note, we found that the proportion of women authors per trial was significantly lower in industry-sponsored trials, compared with those trials that were funded by government or nonprofit organizations or universities, for example. Perhaps the most striking finding from our manuscript was that trials with a woman as first or senior author were associated with a higher proportion of average enrolled female participants.

Dr. Sorrentino:
For those just tuning in, this is Heart Matters on ReachMD. I'm Dr. Matthew Sorrentino, and today I'm speaking with Dr. Reza from the University of Pennsylvania about her study on gender disparities in heart failure research and in clinical trials. So, Dr. Reza, let's talk a little bit more about the implications of your study. Based on these findings, what do you think can be done to help increase not only

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female representation in the heart failure research field, but getting more female patients into our clinical trials?

Dr. Reza:
Yeah, that's a great question. We think that these data argue for broadscale efforts to increase the number of women authors in clinical trials, consensus statements, and guidelines. More women need to be included on journal editorial boards, clinical trial leadership committees, guideline-writing committees. And perhaps we can think creatively about utilizing biased mitigation strategies, like gender-blind application evaluations and competency-based applications, and perhaps these sorts of initiatives need to be instituted. I think additionally, as we saw in the findings of our paper, women were significantly less likely to be authors of trials that were associated with industry funding, and so women need more opportunities to collaborate with funding sponsors. And we think the downstream benefits of these kinds of initiatives will include the development of experienced and accomplished women investigators, additional mentors in the field of heart failure, and then, sort of as we mentioned, hopefully the increased enrollment of women in clinical trials.

Dr. Sorrentino:
Do you think there is still a lack of senior female mentors, full professors, tenured professors and that could be part of the reason why we're not seeing as many women on the guidelines committees and as leads of these major studies?

Dr. Reza:
That is a great question, and actually one that came up in our peer review process, this concept of lag time. And perhaps that, you know, if we wait a few more years, maybe we'll start to see a greater number of women who are in these positions to be eligible. I think that despite sort of thinking about this concept of lag time, women are still not achieving positions like, advanced professorships or becoming chairs of cardiology or becoming, editors-in-chiefs of cardiology journals at the same rate that you would expect. So, in total, I do think there is a component of lag time. I do think that, as I mentioned, you know, the number of women cardiology trainees has remained sort of stagnant, at 20% over the last few years. But that doesn't tell the whole story. I think there is a separate narrative that women have been excluded from achieving these different opportunities, based on traditional career metrics, and I think active strategies to mitigate this are certainly needed.

Dr. Sorrentino:
Before we wrap up, are there any last words you would like to say about things that we can do now about getting more women trainees into cardiology and getting more female patients into our studies?

Dr. Reza:
Yes, absolutely. I do think there are very exciting initiatives that we can all support that are starting, for example, the Take Her Heart to Health initiative that is being led by many members in our professional societies. They're trying to tackle these gender disparities in cardiovascular device trial involvement, and I think these exciting strategies are really showing the innovative approaches that we need to take to move the needle on these metrics. I think supporting the careers of women and underrepresented populations in cardiovascular medicine is certainly a team effort, and specifically for heart failure, multiple stakeholders in the heart failure research enterprise must work together in partnership to address these disparities in patient engagement and clinical research culture. I think the more that we can elevate women and underrepresented populations and cardiologists to these positions, and give them an opportunity, I think that in itself will go a long way to recruiting more and more women cardiologists, and historically-excluded populations into our field.

Dr. Sorrentino:
I want to thank Dr. Reza for joining me to walk us through her study on gender disparities in heart failure research, and bringing to light such an important issue. Dr. Reza, it was great speaking with you today about your study.

Dr. Reza:
It was my sincere pleasure. Thank you so much for having me.

Dr. Sorrentino:
For ReachMD, I'm Dr. Matthew Sorrentino. To access this episode and others from this series, visit reachmd.com/heartmatters, where you can Be Part of the Knowledge. Thanks for listening.

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