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Do Gender Differences Exist in Patient Preferences for Cardiovascular Testing?

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Important gender disparities in the care of cardiovascular disease have been suggested for decades. For example, prior literature suggests that women who present with acute coronary events are less likely to receive coronary angiography or revascularization.^{1–5} These differences in the use of invasive procedures persist even after considering important patient factors that may explain variation in care such as gender differences in co-morbidities, health risk behaviors, and socioeconomic factors – suggesting that these differences may represent meaningful disparities.

The Institute of Medicine's *Unequal Treatment* report defines disparities as differences in treatment that remain after accounting for patient characteristics including clinically appropriate needs, the demands of coexisting conditions, and patient preferences.^{6, 7} Although prior work investigating gender disparities in cardiovascular procedures have typically controlled for clinical need and coexisting conditions, few have had the ability to measure patient preferences.^{8, 9} Therefore, the extent to which observed gender differences truly represent gender disparities in cardiovascular care is relatively unknown.

In this issue of *Annals of Emergency Medicine*, Mumma et al.¹⁰ address this important gap in the current literature by investigating the treatment preferences of women and men for cardiovascular testing and procedures. The prospective cohort study was conducted among consecutive patients presenting to 4 emergency departments with symptoms of potential acute coronary syndrome. Based on hypothetical scenarios, 1080 patients completed a survey assessing their preferences for non-invasive cardiac testing versus cardiac catheterization, medical versus interventional management and their likelihood of following physician recommendations for each testing option. Actual 30-day cardiovascular testing and interventions were also measured.

The authors demonstrated that women and men equally preferred non-invasive testing over cardiac catheterization and medical management over revascularization. While women were equally likely to say they would accept their physician's recommendation for a stress test, women were 7% (CI 2%–12%) less likely than men to say they would accept their physician's recommendation for cardiac catheterization. In regards to actual tests eventually performed during their hospital course, the authors found that women received equal rates of stress testing compared to men but 7% (CI 2%–11%) lower rates of cardiac catheterization compared to men. Although absolute event rates were low, no gender differences in 30-day death, acute myocardial infarction or revascularization were found.

The authors should be commended on undertaking an important area of study which has been largely unexplored. An important strength of this study is the effort to measure patient preferences at the time of the clinical encounter. Furthermore, the study is generalizable to a broad population of patients presenting to emergency departments with symptoms suggestive of acute coronary syndrome.

Several limitations on how patient preferences were measured in this study warrant mention. First, preferences for all tests were measured among all patients, regardless of whether a test

was clinically indicated or appropriate for that particular patient's presenting symptoms. According to the IOM, differences in treatment can only be considered disparities if the test or treatment being considered is equally indicated or appropriate in both populations. Second, as the authors acknowledge, patient preferences in this study may have been influenced by the treating provider's comments to the patient prior to them completing the survey. If a provider tells the patient that based on their initial assessment, they feel the likelihood of acute coronary syndrome is low, the patients' subsequent preferences for additional testing or treatment is likely to be influenced. Thus, if a provider systematically underestimates the risk in women versus men, then the provider's biased interpretations could influence patient perceptions and ultimately patient reported preferences.

Finally, although the authors were able to find significant gender differences in patient's preferences for cardiac catheterization that paralleled the gender differences observed in actual cardiac catheterizations performed, the study did not directly determine the actual reasons for lower rates of angiography in women. Specifically, they did not match a patient's expressed preferences for treatment in their hypothetical scenarios with the therapy ultimately offered or accepted during the patient's hospital course. Therefore, it is not possible from this study to determine the degree to which differences in the rates of cardiac catheterization between women and men can be explained by gender differences in patient preferences. It is worth noting that the few studies that have explicitly examined this issue have found that patient preferences accounted for a relatively small percentage of the overall gender differences observed in actual procedure use.^{8, 9, 11}

Given the limitations discussed, an alternative approach to measuring patient preferences would be to measure preferences for a given treatment among women and men in whom the treatment is equally indicated and at the time of their actual clinical interaction with their health care provider. Furthermore, to more accurately understand how patient preferences influence ultimate therapies provided, we would need to understand what providers recommended at each step of the evaluation process, how strongly they made these recommendations, and what patient's ultimately elected to do with these recommendations.

Assuming at least a portion of the gender differences seen in the use of invasive procedures demonstrated in this and other studies truly represent disparities in care, the next logical step is to understand their causes. Potential determinants of residual gender disparities once patient factors have been considered include health system and provider factors.^{6, 12} From the health system perspective, the legal and regulatory climate in which the health system operates may influence disparities.¹² From the provider perspective, greater clinical uncertainty when interacting with female patients; beliefs or stereotypes about the behavior or health of female patients; and bias or prejudice toward women have all been proposed as contributors to disparities.^{6, 7, 12–15} Despite extensive evidence documenting gender disparities in cardiovascular care, few studies have investigated their causes. Studies such as the one by Mumma et al. are important steps in moving gender disparities research forward from describing where differences and disparities exist in cardiovascular care towards beginning to understand their potential causes.

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