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Editorial

In pursuit of equity: Shedding light on gender differences in post-arrest care treatment of out-of-hospital cardiac arrest



Gender differences in out-of-hospital cardiac arrest (OHCA) including receipt of bystander CPR and subsequent survival have been seen repeatedly in the literature.^{1–4} Of additional interest, is whether there are gender differences in elements post-cardiac arrest that impact survival from OHCA. Studies have demonstrated gender variation in treatment of sudden cardiac arrest with differences seen in coronary angiography (CAG), specifically with female gender being associated with lower use of early CAG.^{5,6} Few studies have elucidated the cause of this, or considered the relationship of electrocardiography (ECG) and first shockable rhythm. This is important to consider since among patients with a shockable rhythm, female gender is associated with good long-term outcome.² Lindgren et al. presents one of the first and largest study to examine the interaction of gender on CAG and subsequent findings, after stratifying by ECG pattern (Ventricular Fibrillation/Pulseless Ventricular Tachycardia).⁷ Understanding this interaction will guide our knowledge of whether there is opportunity to better understand gender and outcomes from OHCA and address potential gender bias.

In their recent work, Lindgren et al. assessed whether there were gender differences in CAG and angiographic findings after OHCA through a retrospective cohort study design. To examine this, they used data from the Swedish Register for Cardiopulmonary Resuscitation (SRCR) from 2008 to 2013 and merged these data with the Swedeheart Registry to collect the in-hospital data elements. Patients undergoing CAG on the same day as the OHCA were classified as having early CAG.⁷ Additionally, this study stratified by ECG pattern, since there is a known difference by shockable rhythm, gender and long-term outcome.

Findings that impact on our understanding of gender and outcomes from OHCA

Using data from the Swedish registry, Lindgren et al. demonstrated that early CAG did not differ by gender when controlling for other variables and stratifying by ECG pattern. Of note, the analysis included patients with an initial shockable rhythm in contrast to former studies that included all patients, which may impact these findings.⁸ Additionally, there was no difference in long-term survival by gender. A recent study using the Paris PROCAT registry found that women were less likely to receive early CAG (OR: 0.57 (95% CI: 0.41–0.79) but

there was no difference by gender and outcome at hospital discharge.⁸ In contrast, the findings from Adellsson et al. demonstrate that female gender was associated with long-term survival.⁹ Given Lindgren et al.'s objective to assess early CAG stratified by initial rhythm, it may be possible that the smaller sample size is influencing the lack of difference seen in outcome by gender. Additionally, the age of the women in the Lindgren et al dataset were older (mean age: 65.3 (18–96)),⁷ which may affect the findings with regards to CAG and survival, since previous studies have demonstrated that younger-aged females are more likely to survive.^{3,4} A study using the Pan Asian Resuscitation Outcomes Study registry found that women in the reproductive age group (age 18–44 years) were significantly more likely to have higher survival to hospital discharge after adjusting for confounding variables.³ Future research may consider these elements which may aid the resuscitation community in understanding the mechanisms affecting disparities post-cardiac arrest. Regardless, Lindgren et al's findings are important to consider to advance our knowledge of gender disparities post-resuscitation. In addition to demographic gender differences, these analyses help provide insight on potential provider-level biases.

Findings that impact our understanding of implicit gender bias

Provider-level bias can be viewed as implicit bias, or bias that describes attitudes towards individuals or stereotypes without conscious knowledge.¹⁰ Examining how individuals are treated in the clinical context immediately after resuscitation, provides insight on whether there is implicit gender bias affecting treatment of individuals by gender. Regarding these findings, there was no difference in gender with receipt of early CAG while controlling for other potentially confounding variables and stratifying by ECG. This suggests that there was no evidence of potential implicit gender bias in this cohort. Additionally, there was no observed difference by gender in the unadjusted univariate model or when examining survival ($p = ns$, respectively).⁷ Overall, these findings are positive and speak to potential advancements made to address implicit gender biases in this population.

While the lack of gender difference in post-resuscitation care and survival in this cohort are affirmative in our understanding of potential implicit bias, it may also be worth considering if these findings reflect

the government, health system and infrastructure in Sweden. Future work may consider examining similar assessments in locations such as the United States, where the individual-level demographics, access to health care, and economic disparities are more pronounced.

Future work with gender disparities – towards equity in treatment and outcome

Gender disparities and potential gender bias are ongoing issues observed in areas including medicine, academia, and recently in outcomes within the field of resuscitation. Studies continue to suggest variation in survival from sudden cardiac arrest with respect to differences in receipt of bystander CPR and differences in post-resuscitation care by gender.^{1,4} Given the complexity of the chain of survival and methods to improve survival from sudden cardiac arrest, there is a need for the resuscitation community to come together to understand the underlying disparities to improve outcomes from cardiac arrest. Through unified reporting, epidemiologic data collection, and robust consideration of study design, we may gain a better understanding of the underlying gender disparities that affect outcomes from sudden cardiac arrest. The time is ripe to further our understanding of disparities in the field of resuscitation to improve outcomes from sudden cardiac arrest for all victims, regardless of gender.

This work helps shed light on gender differences post-resuscitation and the possibility of implicit bias in this cohort. While the lack of differences are reassuring, especially in the Swedish context, future work is needed to continue to pursue gender equity and address gender differences in out-of-hospital cardiac arrest.

Conflict of interest

Drs. Blewer and Ong declare no conflicts of interest.

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