EDITORIAL

# Worse Outcomes after Coronary Artery Bypass Graft Surgery in Females: Delayed Care, Misdiagnosis, or Just a Sex Issue?

*Peores resultados de cirugía de revascularización coronaria en mujeres – ¿Demoras en atención médica, diagnósticos errados o es cuestión del sexo?*

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Identifying cardiovascular risk factors and predictors of adverse or favorable outcomes with different therapeutic options has always been of utmost importance in medical practice. Traditionally, male sex has been perceived to be at greater risk for cardiovascular diseases, including coronary artery disease (CAD). However, this idea may contribute to underestimating the risk of CAD in female patients, as Daugherty et al. demonstrated in a survey of cardiologists practicing in the USA. (1) In this study, case vignettes were presented to the participants who were asked to estimate the likelihood of CAD in each case. Cardiologists tended to consider male patients as being at higher risk than female patients, even though all the cases described patients at intermediate risk for CAD. In addition, the majority of cardiologists considered that men were more prone to take risks and would benefit the most from undergoing coronary angiography. (1) These biases can adversely affect the diagnosis and treatment of female patients with CAD.

Several studies including hundreds of thousands of patients from the National Inpatient Sample (NIS) database of the USA have demonstrated that women have worse outcomes after undergoing coronary artery bypass (CABG) surgery. (2, 3) One of these studies showed that female patients had higher rates of percutaneous coronary interventions (PCI), instead of CABG, and of stroke after PCI. (3) In addition, among patients undergoing redo CABG, female sex was associated with greater risk of complications, including mortality, stroke, bleeding and the composite of severe cardiovascular events and stroke. (1)

Elbaz-Greener et al. also used the NIS data to analyze the trends in utilization of CABGS in patients hospitalized with non-ST-segment elevation myocardial infarction between 2003 and 2005. (4) In this study, female sex and delayed CABG timing were independent predictors of adverse outcomes.

Probably the STICH trial is the most relevant study on this topic worldwide. This multicenter, international, and randomized trial compared the outcomes of patients with left ventricular ejection fraction ≤35% who were assigned to CABG and medical therapy vs. medical therapy alone. (5) Piña et al. analyzed the entire sample (both therapeutic groups) and found that all-cause mortality and cardiovascular mortality were lower in women than in men. However, when each therapeutic group was analyzed separately, there was no statistically significant interaction between sex and mortality, although postoperative mortality was more than three times lower (1.5% vs. 5.1%; P = 0.187) in women, but without statistically significant difference. (5)

In Latin America, several studies of patients undergoing CABG have shown, higher mortality rates in women when compared with men. (6) However, the interpretation of this information is not so clear due to the retrospective nature of most of the evidence. For this reason, Giorgini et al. decided to apply propensity score matching analysis to investigate the outcomes of patients undergoing CABG at the Hospital de Clínicas, University of Buenos Aires and associated centers. (7) In this study, 60 day-mortality after surgery was more than twice higher in female vs. male patients (5.23% vs. 2.5%; p = 0.004). Women also tended to receive combined surgeries and lower number of grafts at a higher rate than men (2.3 vs. 2.5; p = 0.003). (7)

Although the prevalences of many cardiovascular risk factors (dyslipidemia, smoking and diabetes) were higher in men, women were older (69.8 vs. 65.2 years; p < 0.001) and had more comorbidities, including twice as many patients with atrial fibrillation (7.1 vs. 3.6%; p = 0,003), six times higher prevalence of heart failure (4.3% vs. 0.7%; p < 0,001), higher EuroSCORE (4.1 vs. 2.9; p = 0.002) and lower mean kidney function. (7)

After risk propensity analysis, mortality rate for women was still almost twice that of men, but this difference was not statistically significant. A possible explanation for this may have been a decrease in the number of women to less than half its original size during this analysis. (7) Another possible explanation

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would be the correction for confounding factors as age and cardiovascular comorbidities that had been observed more frequently in the initial female sample. However, this study confirmed the international observations of higher mortality in women undergoing CABG, at least before the risk propensity analysis, in Argentine patients.

Cardiologists and other physicians should ask ourselves about the reason of this observation. One hypothesis is that women may take longer to identify the symptoms of angina or myocardial infarction and therefore delay seeking medical care. However, the medical community must also take responsibility for assessing whether our biases in diagnosis and clinical management are negatively affecting our patients. Future studies should address this issue comprehensively and analyze the roles of health care professionals and patients, as well as family and social support, in this disparity.

### Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/ Supplementary material)

### Ethical considerations

Not applicable.

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