

Women and STEMI: a shared responsibility

Mujer e IAMCEST: una responsabilidad compartida

Miren Telleria Arrieta*

Servicio de Cardiología, Hospital Universitario Donostia, Donostia, Guipúzcoa, Spain

SEE RELATED CONTENT:

<https://doi.org/10.24875/RECICE.M19000061>

The sex-based differences in approach and mortality in the management of patients with acute coronary syndrome (ACS) have been known for a while now. Back in 1991 the *New England Journal of Medicine* published an editorial¹ on this matter. In this article Healy coined the term "the Yentl Syndrome" to refer to the invisibility of women in the studies of cardiovascular disease. She argued that women should behave according to the masculine clinical standards to receive the same care; otherwise they were misdiagnosed and mistreated resulting in healthcare of a lower quality and effectiveness.

Over the last few decades, cardiovascular mortality has decreased thanks to the advances made in the prevention, diagnosis, and treatment of ischemic heart disease. This improvement has benefited women as well. According to the RESCATE II registry,² between 1992 and 2003, in-hospital mortality after a first acute myocardial infarction decreased 25% in women. In spite of this, unlike what happens with males, circulatory system diseases are still the leading cause of mortality among women.³ In the study presented by Anguita et al.⁴ in the last European Congress of Cardiology, female sex was still an independent predictor factor of mortality in ST-segment elevation acute myocardial infarction (STEMI) in Spain. In this study, the authors retrospectively analyzed the Minimum Basic Data Set of the Spanish Ministry of Health from 2005 through 2015. They identified 325 017 patients with STEMI of whom 38.8% were women, and concluded that in-hospital adjusted mortality is still high in this group. It should be mentioned that odds ratio dropped from 1.28 in 2006 to 1.14 in 2014, which may be indicative of better care to women with STEMI.

The article by Tomassini et al.⁵ recently published on *REC: Interventional Cardiology* is an in-depth analysis of primary angioplasty and mid- and long-term mortality in patients with STEMI based on sex differences. It is a retrospective analysis of all patients with STEMI presenting with < 12 h of chest pain who underwent a primary angioplasty at their center from March 2006 to December 2016; in total, 1981 patients (24.4% women). According to other registries,⁶ compared to males, women are older (mean age 71.3 ± 11.6 vs 62.9 ± 11.8 years), have a higher prevalence of traditional cardiovascular risk factors, longer total ischemic times, and worse Killip functional class at admission. Oddly enough after matched propensity score analysis, with the same percentage of multivessel coronary artery disease (5.3% vs 4.7%) and stent

implantation (82.9% vs 83.9%), the success of the procedure and ST-segment resolution were significantly lower in women (90.2% vs 94.4% and 47.5% vs 54.1%, respectively). The authors suggest that this is probably due to the different pathophysiology of acute myocardial infarction in women, but they do not say anything about the time elapsed from the first medical contact until guide-wire crossing or subsequent medical therapy, variables that have a direct impact on the prognosis of patients.

As interventional cardiologists we have a hard time thinking that there may be different system delays because when the infarction code goes off, the most important thing is to find the ST-segment elevation on the EKG, the timeline of disease progression, and the patient's clinical signs and hemodynamic status (not always in this order). In any case, we should not forget that treatment starts before and after our intervention.

A study conducted in Portugal⁷ revealed that delays from the first medical contact to radial access were 15 minutes longer among women. This is not an isolated datum. Huded et al.⁸ analyzed variability during management and the results of the STEMI care network from Cleveland Clinic (Ohio, United States). They observed worse quality of care in women, longer door-to-balloon times, and medical therapies inconsistent with the guidelines in a higher percentage of cases. The implementation of an adapted protocol improved these parameters, especially among women (the percentage of women who received medical therapy as recommended by the guidelines rose to 98%, and system delays were reduced in 20 minutes). Overall, in-hospital mortality decreased 43%. This makes us think that maybe the variability seen in the management of STEMI is something generalized, that the reduction of discrepancies is possible, and that it can reflect the quality and maturity of care networks.

It is noteworthy to discuss the atypical nature of symptoms in women as the cause for these delays. The VIRGO clinical trial⁹ interviewed 2009 women and 976 males between 18 and 56 years of age admitted due to an STEMI. In both groups, the main symptom was chest pain defined as pain, pressure, tension or discomfort (87% vs 89.5%). Also, women had more accompanying symptoms (58.5% showed more than 3 additional symptoms compared to 46.2% of males). These data are reproduced in another prospective study conducted at an ER that interviewed 1941 patients with suspected ACS. The study confirmed that 92%

* **Corresponding author:** Unidad de Hemodinámica, Servicio de Cardiología, Hospital Universitario Donostia, P.º Begiristain 109, 20014 Donostia, Guipúzcoa, Spain. E-mail address: mtelarr@gmail.com (M. Telleria Arrieta).

Online: 09-01-2020.

<https://doi.org/10.24875/RECICE.M19000082>

2604-7322 / © 2019 Sociedad Española de Cardiología. Published by Permanyer Publications. This is an open access journal under the CC BY-NC-ND 4.0 license.



of women and 91% of males reported chest pain as the main symptom.¹⁰ When women were asked why did not they look for help earlier,¹¹ most of them thought it was not an STEMI and they did not want to be called hypochondriacs if it was not serious after all. And they may be right. According to the VIRGO trial, 53% of women who previously sought medical attention were told that it was not an acute coronary event. Maybe as Healy used to say¹ women do not belong in the medical and social category of ACS.

For all this, although the management of STEMI in women has improved over the last few decades, articles like Tomassini et al.'s⁵ are a friendly reminder that there is still work to be done. Not only clinical trials, but also daily gestures like rising the awareness of society and healthcare providers that STEMI affects everyone, women included.

CONFLICTS OF INTEREST

None declared.

REFERENCES

1. Healy B. The Yentl Syndrome. *N Engl J Med.* 1991;325:274-275.
2. García-García C, Molina L, Subirana I, et al. Sex-based Differences in Clinical Features, Management, and 28-day and 7-year Prognosis of First Acute Myocardial Infarction. RESCATE II Study. *Rev Esp Cardiol.* 2014;67:28-35.
3. Instituto Nacional de Estadística. Defunciones según la causa de muerte. 2017. Available online: <https://www.ine.es/jaxi/Tabla.htm?path=/t15/p417/a2017/!0/&file=01001.px&L=0>. Accessed 1 Jun 2019.
4. Anguita M, Sambola Ayala A, Elola J, et al. Female sex is an independent predictor of mortality in patients with STEMI in Spain: a study in 325,017 episodes over 11 years (2005-2015). En: Paris 2019. ESC Congress 2019; 2019 31 Aug - 4 Sept; Paris, France. Available online: <https://esc365.escardio.org/Congress/ESC-CONGRESS-2019/Poster-Session-2-Risk-Factors-and-Prevention-Cardiovascular-Disease-in-Spec/197767-female-sex-is-an-independent-predictor-of-mortality-in-patients-with-stemi-in-spain-a-study-in-325-017-episodes-over-11-years-2005-2015>. Accessed 15 Sept 2019.
5. Tomassini F, Cerrato E, Rolfo C, et al. Gender-related differences among patients with STEMI: a propensity score analysis. *REC Interv Cardiol.* 2020; 2:15-21.
6. Mehta L, Beckie T, Devon H, et al. Acute Myocardial Infarction in Women, A scientific statement from the American Heart Association. *Circulation.* 2016;133:916-947.
7. Araújo C, Laszczynska O, Viana M, et al. Quality of Care and 30-day Mortality of Women and Men With Acute Myocardial Infarction. *Rev Esp Cardiol.* 2019;72:543-552.
8. Huded CP, Johnson M, Kravitz K, et al. 4-Step Protocol for Disparities in STEMI Care and Outcomes in Women. *J Am Coll Cardiol.* 2018;71:2122-2132.
9. Lichtman J, Leifheit E, Safdar B, et al. Sex Differences in the Presentation and Perception of Symptoms Among Young Patients With Myocardial Infarction. Evidence from the VIRGO Study (Variation in Recovery: Role of Gender on Outcomes of Young AMI Patients). *Circulation.* 2018;137:781-790.
10. Ferry A, Anand A, Strachan F, et al. Presenting Symptoms in Men and Women Diagnosed with Myocardial Infarction Using Sex-Specific Criteria. *J Am Heart Assoc.* 2019;8:e01297.
11. Lichtman JH, Leifheit-Limson EC, Watanabe E, et al. Symptom recognition and healthcare experiences of young women with acute myocardial infarction. *Circ Cardiovasc Qual Outcomes.* 2015;8:S31-S38.