



# The impact of age and sex on aortic dissection outcomes: a true controversy or lack of standardization?

Rana O. Afifi

Department of Cardiothoracic and Vascular Surgery, McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth), Houston, TX, USA

*Correspondence to:* Rana O. Afifi, MD. Associate Professor of Vascular Surgery, Department of Cardiothoracic and Vascular Surgery, McGovern Medical School at UTHealth, 6400 Fannin St., Ste. #2850, Houston, TX 77030, USA. Email: Rana.O.Afifi@uth.tmc.edu.

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Acute type A aortic dissection (AAAD) is a devastating surgical emergency with significantly high early mortality. Over the years, many have focused research to improve outcomes by identifying mortality risk, improving early diagnosis and modifying management.

In the article by Morjan *et al.* (1), the authors performed a retrospective analysis of a single-center experience, investigating the age- and sex-related outcomes in patients undergoing AAAD repair. The authors defined “older age” arbitrarily, as over 75 years, finding no correlation between older age and worst outcomes. They also found no correlation between sex and mortality in the older age group (1). These findings are contrary to previous studies (2-4). The authors suggest this may be due to plausible exclusion of patients who didn’t undergo surgical repair.

The number of patients with aortic dissection who will die before hospital arrival is significant (20–45%), and women comprise 40–60% of this population. In comparison, women account for one-third of hospitalized aortic dissection cases (5-9). In the International Registry of Acute Aortic Dissection (IRAD) cohorts, women presented with AAAD at an older age and with more complicated presentations, such as shock and tamponade. They were more likely to be managed medically compared to men and, when operated on, had 31.9% surgical mortality, significantly higher than the 21.9% surgical mortality in men (9).

Another important factor contributing to this discrepancy in outcomes is the different definitions of “older age” in

the various publications. The authors chose age 75 as their cutoff for the analysis. However, many previous reports used the age 70 as the cutoff (2-4). The lack of consistency in the definition of “older age” when discussing aortic dissection outcomes makes it difficult to compare studies or come to a generalized conclusion from the available literature. Morjan *et al.* also reported significant differences between men and women in the younger than 75 years group, finding that the incidence of repair of the ascending aorta was higher in women, while hemiarch replacement was higher in men. Women had a shorter cardiopulmonary bypass, cross-clamping, and operation times than men. However, the in-hospital mortality was significantly higher in women (1).

This increased mortality in women following AAAD repair has been reported by some (9,10), yet others found no differences in outcomes based on sex or gender (11,12). The authors considered the reported gender or sex disparities in outcomes of patients with AAAD controversial. It is not controversial. Women appear to not fare as well as men. The controversy is related to the inconsistency in reporting.

The literature either supports higher mortality in women or, at best, equal outcomes. Unfortunately, most of those studies are based on analyzing retrospective data collected with no gender- and sex-oriented approach or questions. The definition of sex *vs.* gender does not appear to be well understood. It is wrongfully used interchangeably in the literature. “Sex” refers to the cluster of biological, chromosomal, and anatomic features associated with maleness and femaleness in the human body. “Gender”

refers to a social classification system prescribing dichotomous roles, behaviors, and norms. Although the system varies across time and culture, two categories, male and female, have predominated, although they have never been inclusive of all people. Gender interacts with, but is not dependent on, sex (13). It is crucial to understand the difference between the two, especially when reporting on disparities in outcomes or disease processes. Most of the publications discussing AAAD outcomes lack the data needed to define whether it is sex- or gender-based difference. Such data should include hormonal history (age at menarche, hormonal replacement therapy, age at menopause) and social determinants of health.

To answer how age, sex, and gender affect outcomes in AAAD, we need a unified definition of “older age” and a standardized design of sex- and gender-oriented research and registries. In addition, we must consider out-of-hospital deaths and medically managed patients. This effort needs to be an international, multicenter one. This would allow a sufficient number of patients to compare different geographic and cultural aspects that may explain the differences in the reported outcomes.

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