

INVITED COMMENTARY

Extra Caution Required in Elective Abdominal Aortic Aneurysm Repair for Women

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Pouncey *et al.* have conducted a relevant meta-analysis comparing the short term outcomes of intact abdominal aortic aneurysm (AAA) repair in women vs. men.¹ Worse overall outcomes for vascular procedures in women have been reported previously, including for AAA repair.^{2,3} However, AAA management has undergone deep transformations, mainly related to advances in endoluminal devices and continuous improvement of open and endovascular techniques.⁴ Additionally, we have seen a gradual improvement in peri-operative care, potentially reducing or eliminating these sex related discrepancies.⁵

Twenty-six large studies were included, spanning 2005–2020. The 30 day mortality risk remained unchanged during this period and was consistently higher in women undergoing open repair (odds ratio [OR] 1.49). Importantly, the difference was even more pronounced for endovascular aneurysm repair (EVAR; OR 1.81). Peri-operative complications, such as the need for transfusions, pulmonary complications and bowel ischaemia, were also more common in women after EVAR and open repair. Other complications, such as arterial injury, limb ischaemia, and renal and cardiac complications, occurred more often in women, but only after EVAR. These worse results in women, persisting over time, are worrisome and should not be overlooked. They put in perspective the proposed lower diameter thresholds for elective repair in women:⁵ if the operative risk is higher, diameter thresholds should be adjusted accordingly.

Despite the robust design and statistical methods applied, it is important to point out some limitations. Firstly, the inclusion criteria for this review may have been too restrictive, potentially leaving out some important data. The authors decided to leave out studies that included fewer than 50 women. This probably resulted in higher quality data, but studies with a smaller population, perhaps with worse outcomes due to lower volume or less experience of the centres, were excluded, reducing the generalisability. A comparison between studies based on mandatory (national) registries and those resulting from expert centres, randomised controlled trials and industry sponsored registries could help resolve this question.

Additionally, a significant proportion of patients included in this meta-analysis underwent complex AAA repair. The

inclusion of complex procedures could be a confounding factor, as they are generally associated with worse outcomes and it is unclear by what proportion these higher risk procedures contribute to the increase in risk for women. The authors partially answered this question by performing a sub-analysis of infrarenal vs. complex AAA repair, and the risk remained high for women, regardless of complexity.

Finally, an interesting finding from the study is that women have more cardiac complications than men after EVAR but not after open surgery. These data are especially surprising, as men more often have cardiac comorbidities and EVAR is generally associated with a lower risk of cardiac complications. A potential explanation is that EVAR, being considered a lower risk procedure, can lead to a less thorough pre-operative workup and some patients with pre-existing coronary disease may be underdiagnosed before surgery. Another possible explanation is that women, compared with men, are prescribed less aggressive secondary prevention that may reduce peri-operative cardiovascular risk.

In conclusion, in spite of technical advances and improvements in peri-operative care, female sex remained associated with a worse prognosis after both modalities of AAA repair. The aetiology of this disparity remains unclear, but this meta-analysis reinforces the need for cautious indications and careful planning and preparation for this type of surgery in women. Specific care pathways for women undergoing AAA repair may be a solution.

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