Reply to Son et al.

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We thank Son et al. [1] for their interest in our article [2] and for the points they raised. The authors bring up an issue that is both important and controversial, i.e. the impact of gender on outcomes after aortic valve surgery as well as the possible differential effect of anaemia in males versus females. Female gender has been included as a factor in many risk-scoring systems including the EuroSCORE [3]. However, several studies have found that female gender is not a risk factor for poor outcomes after aortic valve surgery. Fuchs et al. [4] studied the gender differences of patients undergoing aortic valve replacement (AVR) for isolated severe aortic stenosis and found that although women referred to AVR are older and more symptomatic, gender did not impact on operative and long-term mortality. In the oldest age group of 79 years and older, women even have a better outcome, presumably due to a longer mean life expectancy.

However, it is important to differentiate the effect of gender as a confounder (affecting the relationship between anaemia and outcomes) and as an effect modifier (having a differential effect of anaemia on outcomes based on gender). In order for gender to be a significant confounder, it would have to be associated with either the exposure (anaemia) or outcomes (mortality and morbidity). In our study, we did not find gender to be significantly associated with either variable, and therefore, by definition, gender was not a significant confounder of the relationship between anaemia and outcomes. Furthermore, addition of gender to our multivariable model did not significantly change the effect of anaemia on outcomes. The threshold effect of anaemia on outcomes was observed for the entire cohort and was similar between males and females.

Son et al. [1] also propose the notion that females may have a better tolerance to haemodilution than males. Our study was not designed to answer this question, but there is a lack of convincing evidence supporting this phenomenon in the literature. In our study, the impact of anaemia on outcomes was observed equally in males and females [2]. Son et al. [1] also propose that concomitant coronary artery bypass grafting surgery (CABG) surgery may be a confounder. Similar to gender, concomitant CABG was equally distributed within our exposure groups and addition of this variable to our model did not impact on the relationship between exposure and outcomes, suggesting that it was not a significant confounder in our population.

REFERENCES