ARE THERE GENDER DIFFERENCES IN PATIENTS WITH ACUTE TYPE A AORTIC DISSECTION?

To the Editor:

We read with great interest the recent article of Fukui and colleagues,¹ who investigated the sex differences in patients undergoing surgery for acute type A aortic dissection (ATAAD), which was poorly investigated previously. Fukui and colleagues¹ must be congratulated for their relatively low operative mortality and for shedding light on the important issue of the impact of sex on preoperative characteristics and postoperative outcomes in patients undergoing surgery for ATAAD. They pointed out that there were no differences in early mortality, late reoperation, or late mortality between male and female patients. Multivariate logistic regression analyses also demonstrated that female sex was not an independent predictor of operative mortality. In addition, they addressed the findings that serious preoperative conditions, including myocardial ischemia, brain ischemia, and shock or tamponade, were independent predictors of operative mortality and that the prevalences of these conditions were not significantly different between the sexes, with only shock or tamponade tending to be more frequent in female patients (27.8% vs 20.5%; $P = .0701$).

Nevertheless, this well-illustrated investigation is deserving of additional comments, particularly with respect to the differences in preoperative characteristics of ATAAD between male and female patients. The sex-related differences that are seen after cardiovascular surgery may be related to a sex-specific clustering of preoperative characteristics.² Considering the impact of preoperative characteristics, especially serious conditions, on operative mortality risk for patients with ATAAD, generalized ischemia (shock or hypotension),^{3,4} critical organ-specific ischemias (ie, mesentery, coronary, and cerebral ischemias),⁵⁻⁷ and cardiac tamponade⁸ have been repeatedly demonstrated as independent predictors of operative mortality by a number of investigators. As Fukui and colleagues¹ pointed out, there was only a single study dealing with sex-related differences in patients undergoing repaired ATAAD, which used data from the International Registry of Acute Aortic Dissection.⁹ The sex-related

TABLE 1. Demographic characteristics, clinical presentations, and postoperative outcomes in patients with acute type A aortic dissection

N	Total 202	Women 61	Men 141	P value
Demographic characteristics				
Age (y, mean $\pm$ SD)	58.95 $\pm$ 11.97	64.25 $\pm$ 10.64	56.65 $\pm$ 11.82	<.001
Age ≥ 70 y	42 (21.9%)	20 (34.5%)	22 (16.4%)	.012
Hypertension	163 (80.7%)	48 (78.7%)	115 (81.6%)	.635
Diabetes mellitus	22 (10.9%)	10 (16.4%)	12 (8.5%)	.099
Asthma or COPD	21 (10.8%)	7 (11.5%)	14 (9.9%)	.741
CVA	15 (7.4%)	5 (8.2%)	10 (7.1%)	.783
CAD	13 (6.4%)	5 (8.2%)	8 (5.7%)	.502
Clinical presentation				
Coma or stroke	22 (10.9%)	11 (18.0%)	11 (7.8%)	.032
Shock or hypotension	47 (23.3%)	23 (37.7%)	24 (17.0%)	.002
Cardiac tamponade	47 (23.3%)	23 (37.7%)	24 (17.0%)	.002
Aortic rupture	14 (6.9%)	7 (11.5%)	7 (5.0%)	.100
AR (grade 3 or 4)	73 (36.1%)	24 (39.3%)	49 (34.8%)	.605
CPR before operation	13 (6.4%)	7 (11.5%)	6 (4.3%)	.055
Any pulse deficit	44 (21.8%)	11 (18.0%)	33 (23.4%)	.396
Postoperative outcome				
Initial 24-h bleeding >1500 mL	23 (14.7%)	14 (13.0%)	9 (18.8%)	.593
Reoperation during hospitalization	17 (8.2%)	13 (9.0%)	4 (6.3%)	.326
30-d mortality	29 (14.4%)	14 (23.0%)	15 (10.6%)	.022

Values are presented as number with percentage unless otherwise stated. SD, Standard deviation; COPD, chronic obstructive pulmonary disease; CVA, cerebrovascular accident; CAD, coronary artery disease; AR, aortic regurgitation; CPR, cardiopulmonary resuscitation.

differences of preoperative characteristics have thus not been clearly defined, although Fukui and colleagues¹ have attempted to start filling this gap through their analysis of their experience. We studied the sex disparities in 202 patients (61 women, 30.2%; 141 men, 69.8%) undergoing surgery for ATAAD from 1997 to 2015. Demographic characteristics, clinical presentations, and outcomes are shown in Table 1. Women had significantly higher percentages of major cerebral injury (coma or stroke; 18.0% vs 7.8%; $P = .032$), shock or hypotension (37.7% vs 17.0%; $P = .002$), cardiac tamponade (37.7% vs 17.0%; $P = .002$), and 30-day mortality (23.0% vs 10.6%; $P = .022$) compared with their male counterparts. According to the International Registry of Acute Aortic Dissection analysis,⁹ clinical presentations of pericardial effusion (38.6% vs 28.6%, $P = .001$), congestive heart failure (9.1% vs 5.4%; $P = .03$), coronary artery compromise (10.8% vs 6.9%; $P = .05$), and coma or altered mental status (13.0% vs 9.0%; $P = .05$) occurred more commonly in women. In addition, surgical mortality

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for ATAAD was significantly higher among female than male patients (31.9% vs 21.9%; $P = .013$).⁹ Finally, recent evidence¹⁰ also demonstrates that female sex was strongly correlated with ruptured ATAAD (odds ratio, 1.89; 95% confidence interval, 1.05-3.39; $P = .033$). Moreover, a prospective population-based study from the Oxford Vascular Study¹¹ indicated that a higher portion (61.1%) of out-of-hospital cardiac arrest (ie, immediately fatal) after the incidence of acute type A dissection were women. More research is therefore needed in this area to further define the sex-related differences in patients with acute type A aortic dissection.

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GENDER DIFFERENCES IN ACUTE TYPE A AORTIC DISSECTION

Reply to the Editor:

We appreciate Shih and colleagues' interest and comments on our article.¹ Sex-related differences in patients undergoing repair of acute type A aortic dissection (AAAD) should be of great interest, given the important public health implications of understanding sex differences in outcomes after AAAD repair. However, only 1 previous study has focused on sex-related differences in patients undergoing surgical repair of AAAD using data from the International Registry of Acute Aortic Dissection (IRAD).² In that study, postoperative outcomes were significantly worse in female patients compared with male patients.

Shih and colleagues report results similar to those of the IRAD study, with worse outcomes in their female patients compared with their male patients.³ We respect their results, but there are several differences between their study and our study. Compared with our female patients, their females had a significantly worse overall preoperative clinical presentation, including 18% of patients with coma/stroke (vs 6.9% [brain ischemia] of our patients), 37.7% with shock (vs 19.6% of our patients), and 39.3% with grade 3 or 4 aortic regurgitation (vs 9.4% of our patients). Moreover, our study included a relatively recent cohort (between 2006 and 2013) that was managed according to modern operative techniques and advanced intensive unit care. We speculate that improvements in surgical techniques, critical care, and rehabilitation might result in equivalent outcomes in both sexes.

As suggested by Shih and colleagues, female patients with AAAD tend to have more critical conditions (ie, rupture or cardiac arrest) compared with male patients.⁴ Huynh and colleagues⁵ have suggested a possible histological difference in aortic wall tissue by sex; however, there is no evidence of sex-based basic differences in aortic wall tissue. We agree with Shih and colleagues' suggestion that further clinical and basic research is needed to define sex-related differences in patients with AAAD.