

The impact of obesity on postoperative outcomes in adults with repaired Tetralogy of Fallot undergoing pulmonary valve replacement.

Matthew W Buelow, Salil Ginde, Garick D Hill, Scott B Cohen, Peter J Bartz, and Michael G Earing

The Wisconsin Adult Congenital Heart Disease Program (WAtCH), Medical College of Wisconsin, Milwaukee, WI, USA.

Background: It is estimated that 40 to 54% of adults with congenital heart disease (CHD) are either overweight or obese with a body mass index (BMI) $> 25 \text{ kg/m}^2$. The impact of obesity on outcomes after cardiac surgery in adults with CHD is currently unknown. This is in contrast to the literature available in adults undergoing surgery for acquired heart disease such as coronary artery bypass. In patients with acquired heart disease, obesity is an independent risk factor for early operative mortality and postoperative complications such as acute kidney injury, atrial arrhythmias, prolonged ventilation, and prolonged hospital length of stay. The aim of our study was to evaluate the impact of obesity on post-operative outcomes in adult patients with Tetralogy of Fallot (TOF) undergoing pulmonary valve replacement (PVR).

Methods: We performed a retrospective review of adults (age $> 18 \text{ y/o}$) with repaired TOF who underwent PVR at our institution from 2000-2012. Obesity was defined as BMI $\geq 30 \text{ kg/m}^2$ at the time of PVR.

Results: A total of 71 patients with repaired TOF underwent PVR at a mean age of $31 \pm 13 \text{ yrs}$. The mean BMI of the cohort was $25.9 \pm 6.9 \text{ kg/m}^2$, and 17 (24%) were obese. The criteria for obesity was met in 17 (24%) patients. Obese patients were more likely to have a preoperative diagnosis of hypertension ($p=0.02$) compared to non-obese patients. There was no postoperative mortality. Obese patients had a longer hospital length of stay (6.6 vs. 4.7 days; $p<0.001$) and increased incidence of post-operative arrhythmias (29% vs. 5.6%; $p=0.003$) compared to non-obese patients. By multivariable logistic regression analysis, obesity was independently associated with hospital length of stay $> 5 \text{ days}$ (OR=5.2; 95% CI: 1.5-18.2, $p=0.01$) and with increased post-operative arrhythmias (OR=8.2, 95% CI: 1.7-40, $p<0.01$), whereas HTN was not an independent risk factor. There was a trend for post-operative acute kidney injury in obese vs. non-obese patients (18% vs. 9%), but this did not reach statistical significance. There was no significant relationship between obesity and prolonged mechanical ventilation, post-operative infection, or need for reoperation.

Conclusion: Obesity is associated with worse post-operative outcomes in adults with TOF undergoing PVR, including longer hospitalization and higher risk for post-operative arrhythmias. Efforts to reduce the prevalence of obesity for the growing population of adults with CHD are needed, especially for patients that are followed with compensated valve disease that may require surgical intervention in the future.