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Editorial

Acute Coronary Syndrome and Aortic Stenosis: A Lethal Combo!

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See article by Chew et al., pages 1220–1227 of this issue.

In this issue of the *Canadian Journal of Cardiology*, Chew and colleagues[1] report on the outcomes of 563 patients with acute coronary syndrome (ACS) and aortic stenosis (AS), seen over a 10-year period. They demonstrate that approximately one-half of those with moderate or severe AS, and more than one-third of those with mild AS, died during follow-up, which averaged 2.5 years. Although these numbers are sobering, so too is the 30-day mortality of 17% for severe, 13% for moderate, and 6.4% for mild AS. Although Crimi and colleagues[2] had demonstrated the adverse impact of AS on elderly patients with ACS, and Singh and colleagues[3] had highlighted both the increasing prevalence of AS with age in patients with ST-elevated myocardial infarction (STEMI) and their increased mortality rate, this high very early mortality should compel clinicians to ascertain whether or not their patients with ACS have AS and to consider carefully a therapeutic approach that could mitigate this risk.

Unfortunately, recognition of the high mortality of patients with ACS and moderate or severe AS invites many more questions than answers. When do these deaths occur? What are the pathophysiological processes that lead to these deaths? What strategies can clinicians employ to reduce the likelihood of death? Is the best approach to deal first definitively with the ACS then consider the AS, or is there a place for early or immediate surgery for revascularization and aortic valve replacement (AVR)? If the decision is revascularize first and defer AVR, what is the optimal timing of the valve replacement? Does the preferred timing of valve replacement differ with a surgical vs transcatheter approach?

In the early hours of ACS it is understandable that the focus is on establishing effective revascularization of the ischemic or infarcting myocardium. This is most commonly achieved with placement of drug-eluting stents. Guidelines suggest instituting dual antiplatelet therapy usually for at least 1 year, although shorter duration may be appropriate in some circumstances.[4] Cardiac surgery during or soon after dual antiplatelet therapy is associated with major bleeding,[5] whereas interruption of antiplatelet therapy carries a risk of stent thrombosis.[4] In this setting, transcatheter AVR becomes an attractive option if the patient and valve characteristics are favourable.

Thirty-one patients had AVR, which occurred in the first year in just more than one-half. Importantly, a significant portion of these patients had diabetes or left ventricular systolic dysfunction. Despite this, those patients selected for AVR (a nonrandom process that may have influenced outcome) had better survival than those who did not receive AVR, as seen in Supplemental Fig. S3, with a 3-year mortality rate approximately 20% for AVR and approximately 40% for no AVR ($P = 0.009$).

The presence of both coronary artery disease and AS confounds attribution of symptoms to either disease process. Historically, recommendation for valve replacement has required the presence of symptoms attributable to AS. More recently, it has become evident that even moderate stenosis in the absence of symptoms and the presence of very severe stenosis has a poor prognosis, prompting consideration of valve replacement in these patients. The **R**andomized Comparison of **E**arly vs **Co**nventional Treatment in **Very** Severe Aortic Stenosis (RECOVERY) trial demonstrated a lower incidence of operative mortality or death from cardiovascular causes among asymptomatic patients with very severe AS randomized to early AVR than those receiving conservative care.[6] Similarly, the **A**ortic **V**alve Repl**a**cement Versus Conservative **T**reatment in **A**symptomatic Sever**e** Aortic Stenosis (AVATAR) trial, which randomized asymptomatic patients with severe AS to early vs delayed AVR, demonstrated that there was a lower incidence of the composite endpoint of all-cause death, acute myocardial infarction, stroke, or unplanned hospitalization for heart failure in those randomized to early surgery compared with a conservative strategy.[7] These trials provide support to those advocating for earlier valve replacement in asymptomatic patients with severe AS. Absent clinical trials of early intervention to address the increased risk of moderate or severe AS in patients with ACS, it is not unreasonable to consider these data

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somewhat supportive of serious consideration of earlier intervention in some of these patients.

It is evident that the patient population with concomitant ACS and AS is very heterogeneous, with patients ranging from unstable angina and severe hemodynamically compromising AS to those with extensive anterior myocardial infarction and mild AS. The severity and extent of coronary artery disease in these patients is also broad. Accordingly, the therapeutic options considered should be equally broad ranging, from immediate surgical AVR and coronary artery bypass grafting to medical therapy with expectant management of the AS.

The article by Chew and colleagues has enhanced our awareness of the lethality of concomitant moderate or severe AS in patients with ACS. This provides us as clinicians with an opportunity to attempt to mitigate that risk with good clinical decision making and, as a research community, to enhance our collective understanding of the pathophysiology and best management of these coexisting conditions.

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