INTERVENTIONAL CARDIOLOGY

Variation in cardiac catheterization—implications for patient care

The use of coronary catheterization to identify patients with obstructive coronary artery disease (CAD) who might benefit from revascularization varies significantly between New York State, USA and Ontario, Canada. This finding, from a new study by Dennis Ko and colleagues, has important implications in terms of the cost-effectiveness of patient care in these areas.

A higher number of catheterizations per capita are performed in New York than in Ontario. Accordingly, Ko *et al.* set out to determine whether this discrepancy was “because of a difference in patient characteristics [that is, a higher burden of CAD in New York] or how patients are being selected for the cardiac procedure”. The investigators used data on 18,114 patients from The New York Cardiac Catheterization Database and on 54,933 patients from the Cardiac Care Network of Ontario. Unfortunately, data were not available for patients potentially eligible for catheterization, but who did not undergo the procedure.

Obstructive CAD (defined as diameter stenosis $\geq 50\%$ in the left main coronary

artery, or $\geq 70\%$ in a major epicardial vessel) was detected in 30.4% and 44.8% of patients in New York and Ontario, respectively ($P < 0.001$). Patients in New York were also less likely than those in Ontario to have left main or three-vessel CAD (7.0% vs 13.0%, $P < 0.001$), strong indications of the need for stent placement or CABG surgery.

Patients with obstructive CAD were more likely to undergo percutaneous coronary intervention or CABG surgery within 30 days of catheterization if they were in New York than if they were in Ontario (54.9% vs 34.6% for percutaneous coronary intervention; 20.4% vs 14.1% for CABG surgery, $P < 0.001$ for both comparisons). However, mortality within 30 days of catheterization was slightly higher in New York than in Ontario (0.65% vs 0.38%, $P < 0.001$), although this difference was primarily driven by patients without obstructive CAD.

“Practice variation in clinical care for preference-sensitive decisions should be a call to action to optimize clinical decision-making,” says Harlan Krumholz in an editorial that accompanied the study

publication. “Variations in practice should disturb physicians, not merely because they may indicate wasteful practices, but because of the possibility that such variations do not optimally serve the best interests of patients.”

According to John Spertus, from Saint Luke’s Mid America Heart Institute, Kansas City, MO, USA, the finding that patients who underwent catheterization in Ontario were more likely than those in New York to have obstructive CAD indicates that “there is more careful screening in Ontario prior to performing the procedure”. Furthermore, the increased mortality in those without obstructive CAD in New York compared with Ontario suggests that “there are adverse consequences from a more liberal use of coronary angiography”. Taken together, these data suggest that “New York might be able to provide better, more cost-effective care by creating more rigorous screening methods prior to angiography,” says Spertus. Indeed, Ko *et al.* estimate that US\$75 million could be saved per year if New York were to adopt the same population rate of cardiac catheterization as in Ontario. Spertus adds that “appropriate use criteria for coronary angiography have been introduced in the USA, and it will be important to evaluate whether these might support a better use of [catheterization] in the future.”

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Original article Ko, D. T. *et al.* Prevalence and extent of obstructive coronary artery disease among patients undergoing elective coronary catheterization in New York State and Ontario. *JAMA* 310, 163–169 (2013)