EDITORIAL

Screening for carotid artery stenosis before coronary artery bypass graft

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It is estimated that 1% to 5% of coronary artery bypass graft (CABG) operations are complicated by stroke.[1] Although post-CABG stroke has multifactorial etiology, including embolic events from manipulation of the atherosclerotic aorta or perioperative atrial fibrillation, carotid artery stenosis (CAS) due to atherosclerosis with the subsequent cerebral hypoperfusion has been recognized as an important predictor of neurological complications following CABG.[2] The rationale for performing screening for CAS in the CABG population is that patients with severe carotid disease can benefit from some form of carotid intervention either synchronous or staged to CABG procedure.[3,4] Current guidelines recommend pre-CABG screening for CAS in patients older than 70 years or those with recent history (<6 months) of stroke or transient ischemic attack.[5] Despite those recommendations, the routine in daily practice in many institutions is to screen all CABG patients for CAS irrespectively of their history and age.[6]

In this issue of *Kardiologia Polska* (*Kardiol Pol*, *Polish Heart Journal*), Özyalçın et al[7] sought to investigate the age groups that could benefit from asymptomatic CAS screening using carotid duplex ultrasound (DUS) in patients undergoing CABG. Using data from a retrospective cohort of 644 neurologically intact participants, the authors classified pre-CABG patients into 3 categories based on the degree of CAS: less than 50%, 50% to 70%, or more than 70%; and 4 categories based on their age: 40 to 50, 51 to 60, 61 to 70, or older than 70 years. Severe CAS (>70%) was prevalent in 19.9% of the entire cohort and 12% among the youngest group of patients (40–50 years). The authors investigated whether the SYNTAX score and age could provide prognostic information for CAS. Using a receiver operating characteristic (ROC) curve analysis they determined that a SYNTAX score threshold of 27 is the optimal cutoff for detection of CAS of 70% or greater with a sensitivity of 98.4% and a specificity of 98.3%. Among patients with the SYNTAX score of 27 or greater who had severe CAS (>70%), the ROC curve analysis revealed that 64 years was the optimal age cutoff for maximum accuracy. The sensitivity and specificity for this age were 74.3% and 55.1%, respectively. Hence, they concluded that routine screening for CAS in the CABG population should be extended in patients older than 64 years when their SYNTAX score is 27 or greater, regardless of their prior neurologic history or current neurological symptoms.

Despite the meticulous work by Özyalçın et al,[7] there is a number of important limitations. First, the prevalence of asymptomatic severe carotid stenosis in the entire cohort was approximately 20% which is probably higher compared to the general CABG population.[8] This might have driven down the age cutoff that the authors determined as optimal. Moreover, the area under the curve (AUC) for the recommended age cutoff value of 64 was 73.7%, which could be interpreted as an indicative marker of medium prognostic significance for identifying severe CAS in this cohort. Additionally, there is evidence that the SYNTAX score might not be a valid predictor of CAS in patients with multi-vessel CAD.[9] Interestingly, the SYNTAX score II enables the incorporation of clinical variables in the angiographic information obtained from the SYNTAX score, and can increase the discriminative value for detecting severe CAS in neurologically asymptomatic patients undergoing CABG.[10] Many

clinical and demographic characteristics evaluated in the SYNTAX score II (eg, age, low creatinine clearance, and presence of peripheral artery disease) have been correlated with extracranial carotid artery disease,[11,12] and as such evaluation of this information could enable better selection of CABG patients for carotid screening.

The implications of this study suggested that a cutoff value of more than 70 years for CAS screening in the CABG population might exclude patients of younger age who could benefit from carotid DUS. Even if routine screening for asymptomatic CAS in all age groups cannot be supported, there is evidence that detection and intervention in unilateral asymptomatic carotid stenosis (>70%) can affect postoperative outcomes following CABG.[13] Illuminati et al,[13] in a randomized controlled trial of 181 participants undergoing CABG with unilateral severe asymptomatic CAS, found that prophylactic or synchronous CEA could prevent devastating post-CABG stroke complications compared to delayed CEA. Thus, excluding pre-CABG patients who are younger than 70 years from DUS screening might lead to failure of detection and subsequent beneficial treatment with carotid interventions in a significant percentage of patients.

The SYNTAX score–based information can be very helpful in order to guide carotid screening in CABG patients with asymptomatic CAS. This is extremely important because the majority of patients with concurrent CAS and CAD requiring CABG have asymptomatic carotid pathology,[14] and effective identification along with treatment of severe CAS can reduce the incidence of post-CABG stroke. Further evidence from larger studies is required to evaluate the usefulness of the recommended cutoff values for the SYNTAX score and age from this study in the general CABG population.

ARTICLE INFORMATION

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CONFLICT OF INTEREST None declared.

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