P6427

Positive family history of cardiovascular disease and long-term outcomes after coronary artery bypass grafting in younger patients: a genetic paradox?

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Background: Parental cardiovascular disease (CVD) is a known risk factor for premature CVD in both men and women. It is unknown whether a positive family history (PFH) of premature CVD also affects long-term outcomes after coronary artery bypass grafting (CABG).

Purpose: We estimated the prevalence of PFH of premature CVD in a large population of CABG patients younger than 60 years of age. We evaluated whether PFH is an independent predictor of survival and freedom from major adverse cardiac and cerebrovascular events (MACCEs) following CABG.

Methods: Data come from a prospective longitudinal study of first, non-emergent, CABG patients consecutively recruited at the Innsbruck Medical University between August 2001 and February 2018 (n=5389). Patients were followed up for a median of 8 years. From this study, 2553 patients with premature CAD undergoing CABG under the age of 60 years were identified. Self-reported PFH data was available for 99.3% of patients; n=2535 patients were eligible for these analyses. In line with the Framingham offspring study, a premature PFH of CVD was defined when a patient's father and/or mother experienced their first CV event at <55 (father) and <65 (mother) years of age, respectively. Adjusted multivariable Cox proportional hazards regression was used to assess the effect of PFH on overall and MACCE-free survival.

Results: Premature PFH was found in 54.2% of patients (n=1375). Within these patients, 66.1% had a father who experienced a premature CV event (n=909), 27.8% a mother (n=382) and 6.1% both a mother and a father (n=84). In the majority of cases the patient's parent had experienced a premature cardiac event (85.9%, n=1181), 14.1% of patients with PFH reported their parent(s) had a premature stroke (n=194). Patients with a PFH had lower rates of smoking, diabetes and renal disease but were more likely to be hypertensive. Following CABG, PFH was associated with improved long-term survival (adjusted HR, 0.66; 95% CI, 0.50–0.91; p=0.011) and MACCE-free survival (adjusted HR, 0.73; 95% CI, 0.68–0.89; p=0.01). Among the covariates adjusted for, age, diabetes, renal insufficiency, peripheral arterial disease, impaired left ventricular function, previous cerebrovascular events and previous mediastinal radiation were associated with poorer outcomes. In contrast, multiple arterial grafting by bilateral internal thoracic arteries improved both survival (adjusted HR, 0.52; 95% CI, 0.36–0.74; p<0.001), and MACCE-free survival (adjusted HR, 0.41; 95% CI, 0.31–0.54; p<0.001).

Conclusion: In this cohort of high-risk patients undergoing CABG under 60 years of age, PFH was highly prevalent. Whilst it is evident that a PFH increases the risk of requiring CABG at younger ages, this study shows that PFH is also, paradoxically, protective regarding long-term outcomes; PFH is associated with both improved overall and MACCE-free survival following CABG.