Abstract for midway evaluation

PhD candidate Ingeborg Eskerud

Coronary plaque burden and myocardial ischemia using multimodal imaging in women and men

Non-obstructive coronary artery disease (CAD) (stenosis <50%) is found both in patients with acute coronary syndrome and in patients with stable angina, and is significantly more common in women. The mechanisms behind myocardial ischemia in non-obstructive CAD appear to be multifactorial and incompletely elucidated.

The main objective of this PhD project is to explore associations between coronary plaque burden, plaque composition, left ventricular hypertrophy and myocardial ischemia in women and men with acute myocardial infarction and stable angina pectoris.

Study 1 was a cross sectional study including 108 consecutively recruited patients (32% women) hospitalized at Haukeland University Hospital with acute non-ST elevation myocardial infarction (NSTEMI). All patients were examined with contrast echocardiography at rest for assessment of myocardial perfusion prior to scheduled invasive coronary angiography. The results from Study 1 were published in 2015 (Eskerud et al. J Womens Health (Larchmt). 2015;24:367-73). Women had lower prevalence of coronary artery stenosis ≥50% (74 vs 91%, p<0.05). However, global coronary plaque area (35±22 vs. 43±21mm2) and the number of left ventricular (LV) segments with hypoperfusion (6.9±3.7 vs. 7.2±3.4) did not differ between sexes (both p>0.07). In multivariate analysis, a 10 mm2 larger coronary artery plaque area was associated with a 35% higher risk for having severe myocardial hypoperfusion (odds ratio 1.35 [95% confidence interval 1.01-1.80], p<0.05), while no significant association between artery tortuosity and myocardial ischemia was found.

Study 2 and 3include patients from The Myocardial Ischemia in Non-obstructive Coronary Artery Disease (MicroCAD) study. The MicroCAD study is a cross sectional study conducted at Haukeland University including 132 patients with stable angina pectoris and non-obstructive CAD (stenosis <50%). Myocardial ischemia was diagnosed by myocardial contrast stress echocardiography. Left ventricular hypertrophy by echocardiography was identified if LV mass index >46.7 g/m2.7 in women and >49.2 g/m2.7 in men. Coronary artery plaque burden was quantified on coronary computed tomography angiography images as coronary artery plaque volume and composition. In study 2 we explored whether left ventricular hypertrophy was associated with myocardial ischemia in patients with non-obstructive CAD. In study 3, the aim is to explore the interaction of coronary plaque burden and plaque compositions with clinical risk factors on prevalent myocardial ischemia.