Impact of socioeconomic position on coronary artery disease burden in men and women with de-novo symptoms suggestive of chronic coronary syndrome

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Background: Low socioeconomic position (SEP) is associated with shorter life expectancy and one of the main drivers is an increase in cardiovascular deaths. A higher prevalence of risk factors only partly explains the complex multifactorial pathogenesis. The aim of this study was to investigate the association between SEP and the development of coronary artery disease (CAD) assessed as calcium score (CACS) at coronary computed tomography angiography (CCTA) as well as stenosis at downstream invasive coronary angiography (ICA) in a population presenting with symptoms suggestive of chronic coronary syndrome (CCS). A secondary aim was to establish whether SEP affects men and women differently.

Methods: We included 50,561 patients (Mean age 57.35±11.50, 53.7% women) from the Western Denmark Heart Registry (WDHR) with no previous CAD undergoing CCTA from 2008–2019 for suspected CCS. ICA was conducted in patients where obstructive CAD was not excluded at CCTA. Outcome measures was level of CACS and haemodynamically significant stenosis at ICA defined as either fractional flow reserve <0.80 or visually assed diameter stenosis of $\geq 50\%$ stenosis. Odds Ratio of haemodynamically significant stenosis at ICA was calculated using multiple logistic regression and models adjusted for risk factors (smoking, medical treatment for hypertension, medical treatment for high cholesterol, diabetes and family history of CAD). Information on SEP was obtained from national registries. We included mean individual income at age 30–60 or until CCTA (quintiles); and length of education (<10 years, 10–13 years or >13 years). Information on risk factors was obtained from the WDHR registry.

Results: Mean number of risk factors are presented in each educational group in Figure 1. Median CACS for women with <10 years of education is 2 [0–82] vs. 0 [0–15] for women with >13 years of education ($p<0.001$). For men <10 years of education median CACS is 10 [0–143] vs. 8 [0–118] for men with >13 years of education ($p=0.05$) (Figure 1). Mean number of risk factors are presented at each level of income in Figure 2. For women with low income median CACS was 6 [0–103] vs. 0 [0–3] for women with high income ($p<0.001$). For men with low income median CACS is 8 [0–144] vs. 5 [0–105] for men with high income ($p=0.002$) (Figure 2). The odds ratio (OR) of a stenosis at downstream ICA was 1.47 ($p=0.004$) for women with <10 years of education vs. >13 years of education and 1.17 for men ($p=0.122$). OR of stenosis at ICA was 2.40 ($p<0.001$) for women with low income (1 quintile) using high income (5 quintile) as reference and 1.12 for men ($p=0.321$).

Conclusion: In de-Novo patients referred for CAD rule-out both coronary calcium score and the prevalence of stenosis at ICA is strongly correlated to low income and short education. The correlation seems to be stronger in women compared to men and calls for further research into the mechanism behind low SEP and atherosclerosis.

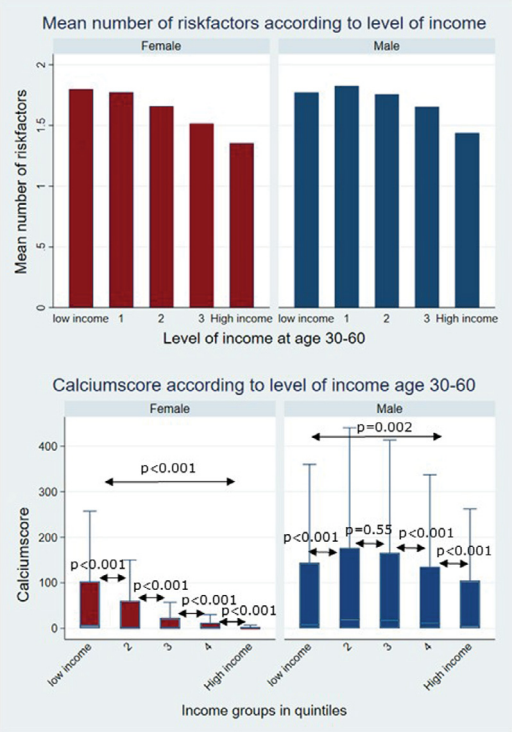

Figure 2