Education inequalities in treatment to prevent cardiovascular disease: clinical and genetic assessment

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Introduction:

The rate of cardiovascular disease (CVD) is declining in high income countries, but individuals with the lowest SEP remain at the highest risk. This is partly explained by the prevalence of CVD risk factors (e.g. higher BMI and smoking prevalence).

Socioeconomic position (SEP) has been associated with primary and secondary CVD treatment rates; but the direction of effect is mixed. Understanding whether statin prescribing is differential by SEP may help explain persisting inequalities.

Methods:

Data: Cross-sectional analysis of White British UK Biobank participants at baseline (N=337 005) and White British participants with linked primary care data (N=151 805)

QRISK: Derived using the QRISK3 algorithm for individuals with complete data for all QRISK3 variables, educational attainment and prescriptions and a QRISK2 score recorded in primary care, prior to a statin prescription (N=8448)

Genetic risk: Genetic risk score (GRS) for coronary heart disease using 41 independent SNPs reaching genome-wide significance threshold

Statistical analysis: Logistic regression of QRISK3 or GRS risk score with **i)** reported statin use **ii)** reported statin use in those with primary care data **iii)** statin use validated by prescription records. Logistic regression of QRISK2 recorded in primary care with primary care prescriptions of statins. All analyses stratified by total years of education and sex

Results:

Primary analyses (Figure 1)

- Strong evidence of an interaction between education and QRISK3, but not between education and the coronary heart disease GRS on reported statin use
- Using genetic data when making clinical decisions may provide an opportunity to reduce inequalities in access to medication and subsequent cardiovascular disease

Secondary analyses (Figure 2)

- Results replicated for the interaction between education and both risk scores on statins when restricting sample to those with primary care data (Panel A, only QRISK3 presented)
- Results replicated for the interaction between education and QRISK3 on statin use validated by prescriptions (Panel B)
- Results replicated, but more imprecise, when testing for an interaction between education and QRISK2 on statin prescriptions (Panel C)

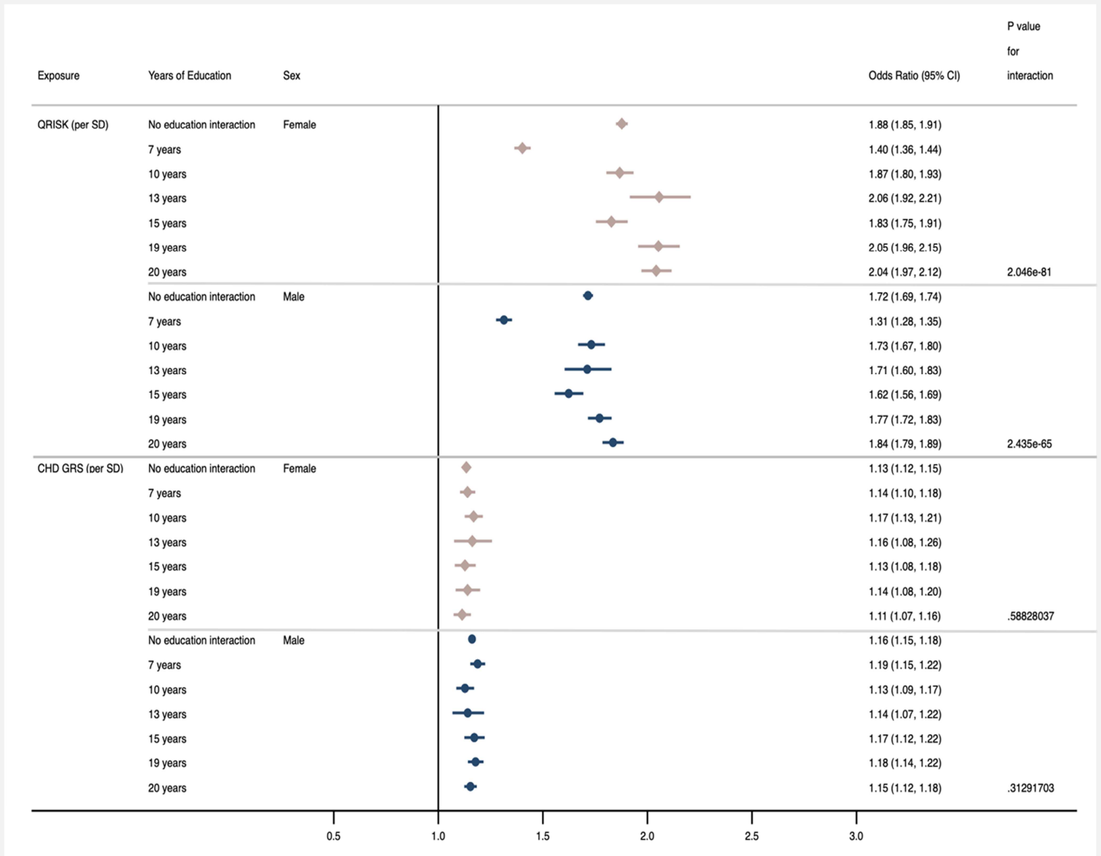

Figure 1: Association of QRISK3 (per standard deviation [SD]) derived from baseline clinic measures in UK Biobank and genetic risk score for coronary heart disease with self-reported statin access, stratified by educational attainment
SD in females: QRISK3 = 5.30 CHD GRS = 0.34 SD in males: QRISK 3 = 8.03 CHD GRS = 0.34

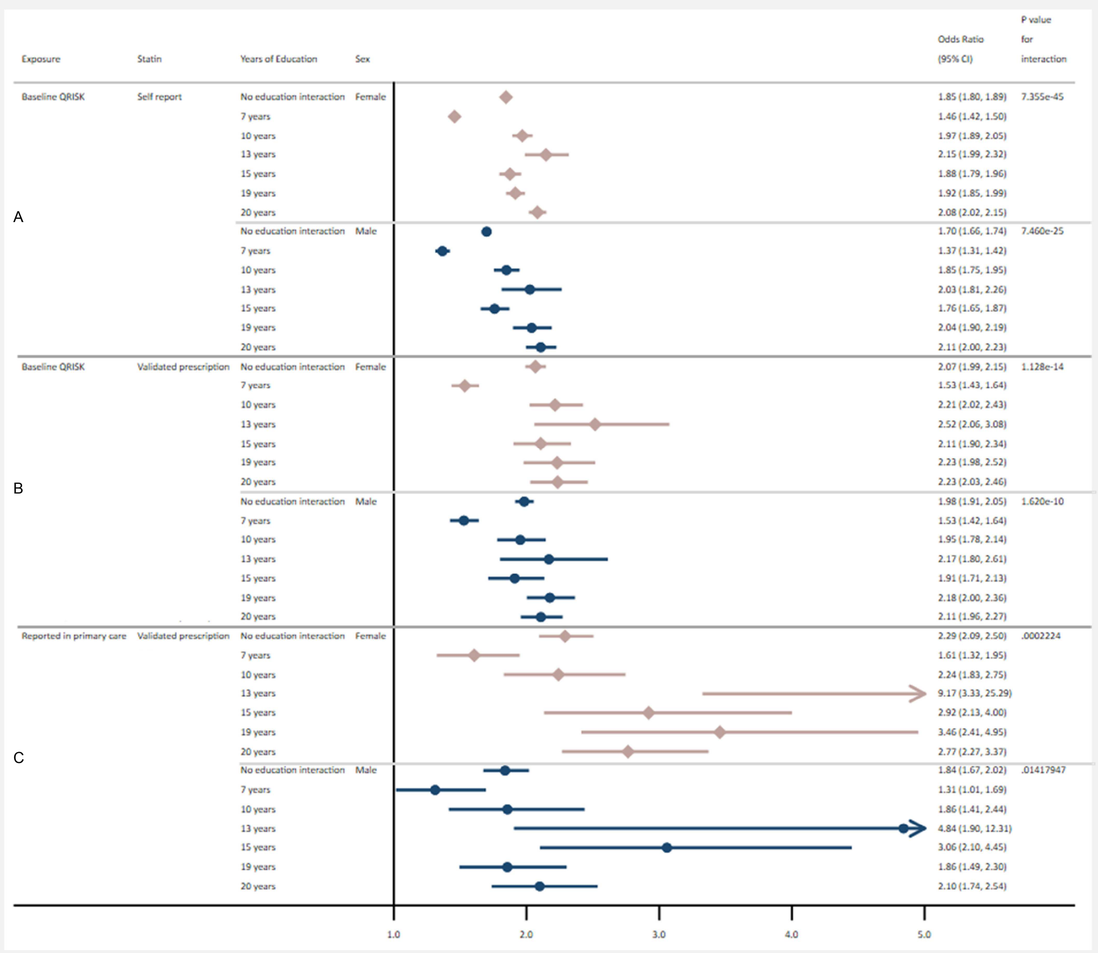

Figure 2: Association of QRISK3 (per SD) derived from baseline clinic measures in UK Biobank or QRISK2 (per SD) recorded in primary care records, with i) self-reported statin access and ii) statins access validated by prescriptions, stratified by educational attainment
SD in females: QRISK2 = 7.36 SD in males: QRISK2 = 9.92

After controlling for QRISK3 as a measure of clinical need for statins, individuals with higher educational attainment have greater access to statins compared with individuals with lower educational attainment

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