UKE Paper of the Month August 2023

Global effect of modifiable risk factors on cardiovascular disease and all-cause mortality

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ABSTRACT:

Background: Five modifiable risk factors are associated with cardiovascular disease and death from any cause. Studies using individual-level data to evaluate the regional and sex-specific prevalence of the risk factors and their effect on these outcomes are lacking.

Methods: We pooled and harmonized individual-level data from 112 cohort studies conducted in 34 countries and 8 geographic regions participating in the Global Cardiovascular Risk Consortium. We examined associations between the risk factors (body-mass index, systolic blood pressure, non-high-density lipoprotein cholesterol, current smoking, and diabetes) and incident cardiovascular disease and death from any cause using Cox regression analyses, stratified according to geographic region, age, and sex. Population-attributable fractions were estimated for the 10-year incidence of cardiovascular disease and 10-year all-cause mortality.

Results: Among 1,518,028 participants (54.1% of whom were women) with a median age of 54.4 years, regional variations in the prevalence of the five modifiable risk factors were noted. Incident cardiovascular disease occurred in 80,596 participants during a median follow-up of 7.3 years (maximum, 47.3), and 177,369 participants died during a median follow-up of 8.7 years (maximum, 47.6). For all five risk factors combined, the aggregate global population-attributable fraction of the 10-year incidence of cardiovascular disease was 57.2% (95% confidence interval [CI], 52.4 to 62.1) among women and 52.6% (95% CI, 49.0 to 56.1) among men, and the corresponding values for 10-year all-cause mortality were 22.2% (95% CI, 16.8 to 27.5) and 19.1% (95% CI, 14.6 to 23.6).

Conclusions: Harmonized individual-level data from a global cohort showed that 57.2% and 52.6% of cases of incident cardiovascular disease among women and men, respectively, and 22.2% and 19.1% of deaths from any cause among women and men, respectively, may be attributable to five modifiable risk factors. (Funded by the German Center for Cardiovascular Research (DZHK); ClinicalTrials.gov number, NCT05466825.).

STATEMENT:

This is the first time that risk factors were investigated for their impact on two major outcomes (cardiovascular disease and all-cause mortality) globally using individual-level data. The proportion of CVD that is attributed to 5 potentially modifiable risk factors is lower than previously expected.

BACKGROUND:

This work was performed at the Population Health Innovation Center in the group of Stefan Blankenberg, Medical Director of the University Heart and Vascular Center Hamburg and led by Christina Magnussen, senior physician in the Clinic for Cardiology, University Heart and Vascular Center, Hamburg. Both authors have strong research interests in the field of population research.