Socioeconomic position influences the risk of first-time cardiovascular event in patients with type 2 diabetes in spite of equal access to healthcare – a Danish nationwide cohort study

A.C. Falkentoft[1], B. Zareini[2], C. Wichmand[1], T.B. Hansen[1], C. Selmer[3], M. Schou[4], P.H. Gaede[5], P.B. Staehr[6], M.A. Hlatky[7], C. Torp-Pedersen[8], G.H. Gislason[2], N.E. Bruun[1], A.C. Ruwald[1]

[1]Zealand University Hospital, Cardiology, Roskilde, Denmark; [2]Gentofte University Hospital, Cardiology, Gentofte, Denmark; [3]Bispebjerg University Hospital, Endocrinology, Copenhagen, Denmark; [4]Herlev Hospital, Department of Cardiology, Herlev, Denmark; [5]Slagelse Hospital, Endocrinology, Slagelse, Denmark; [6]North Denmark Regional Hospital, Cardiology, Hjoerring, Denmark; [7]Stanford University School of Medicine, Department of Health Research and Policy, Stanford, United States of America; [8]Nordsjaellands Hospital, Department of clinical investigation and cardiology, Hilleroed, Denmark

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Background: Social inequality poses a major public health challenge. Low socioeconomic position has been associated with cardiovascular disease in patients without diabetes. Yet, the association between socioeconomic position, type 2 diabetes, and first-time cardiovascular disease has not previously been investigated in a nationwide cohort from a country with equal access to healthcare.

Purpose: To examine the association between socioeconomic position and development of first-time major adverse cardiovascular events (MACE) in a Danish nationwide population of patients with incident type 2 diabetes.

Methods: Using the Danish nationwide registers, we identified all Danish residents with newly diagnosed type 2 diabetes between 2000 and 2017. Patients aged 40–79 years, without a history of ischemic heart disease and/or stroke were included. Income was used as a surrogate for socioeconomic position, and was assessed as quartiles of inflation adjusted, mean five-year income prior to index. Multivariable Cox proportional hazard analyses were used to assess the association between income and the primary composite outcome of ischemic stroke, acute myocardial infarction, and cardiovascular mortality (MACE). We assessed income as a time-dependent variable and adjusted for age, gender, calendar year, baseline comorbidities, and medication.

Results: In total 107,612 patients were included with a median age of 63 (interquartile range [IQR] 55–70) years and a median follow-up time of 6.8 (IQR 3.5–10.6) years. Patients in the lowest income quartile were older (median age 69 vs. 60 years) and more likely to be female (53.3% vs 36.7%) compared with the highest quartile (all P<0.0001). The 10-year risk of MACE decreased with higher income quartile: 30.3% (n=6814) in 1st quartile, 23.4% (n=4760) in 2nd quartile; 19.1% (n=3861) in 3rd quartile; 16.0% (n=3042) in 4th quartile (P<0.0001). In adjusted analysis, using the highest quartile as reference, the relative risk of MACE was inversely proportional to income (P-trend<0.0001): hazard ratio (HR) 1.59 (95% confidence interval [95% CI] 1.52–1.66) in 1st quartile; HR 1.42 (95% CI 1.36–1.49) in 2nd quartile; 1.20 (95% CI 1.14–1.25) in 3rd quartile. We found age specific differences in the risk of MACE between the younger (40–64 years) and the older (65–79 years) patients (P-interaction = 0.007). In stratified adjusted analysis, the youngest age group were associated with higher HR's compared to the oldest age group (Figure). The absolute unadjusted risk of MACE was highest in the elderly with low income.

Conclusions: Despite equal access to healthcare, low socioeconomic position was independently associated with an increased risk of first-time MACE in patients with incident type 2 diabetes. The finding was significant across age groups with the highest relative risks of MACE among younger patients. Our results indicate the importance of prevention strategies targeting patients with low socioeconomic position.

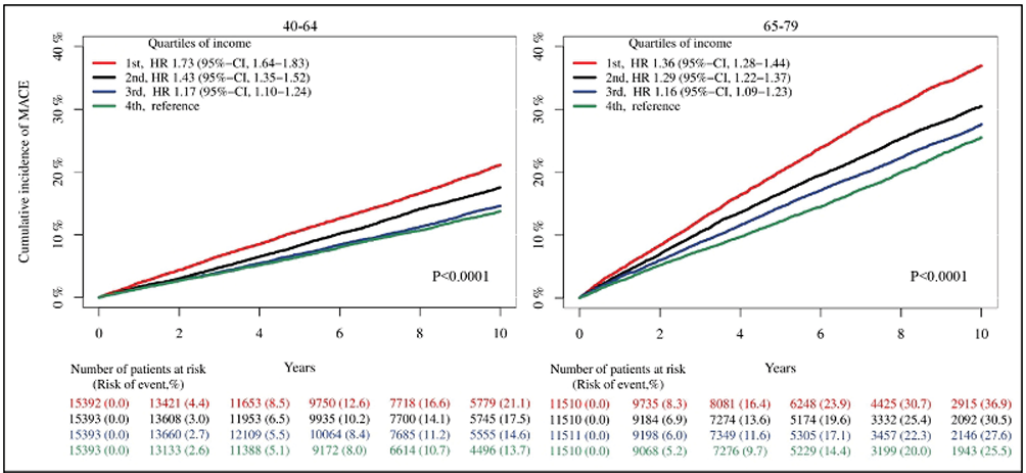

Figure. Risk of major adverse cardiovascular events (MACE) according to socioeconomic position (quartiles of income) and with hazard ratios (HR) adjusted for age, gender, calendar year, baseline medication, and comorbidities. CI, confidence interval.