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Risk factor control in patients with type 2 diabetes and coronary heart disease: Findings from the Swedish National Diabetes Register (NDR)

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Abstract

Aims Previous surveys have shown that patients with type 2 diabetes and coronary heart disease (CHD) are infrequently treated to risk factor targets in current guidelines. Our aim was to examine risk factor management and achievement of current targets in 2005 among Swedish type 2 diabetic patients with CHD.

Methods This study included 5562 patients with first incident of nonfatal CHD from the Swedish National Diabetes Register (NDR), 1719 patients with CHD 1-2 years before 2005, and 3843 patients with CHD 3-7 years before 2005.

Results The achievement of cardiovascular risk factor targets (CHD 1-2 years previously / CHD 3-7 years previously) was: HbA_{1c} <7%: 54%/52%; blood pressure $\leq$130/80 mmHg: 39%/38%; total cholesterol <4.5 mmol/l: 59%/56% (p<0.01); LDL cholesterol <2.5 mmol/l: 66%/63%, triglycerides <1.7 mmol/l: 52%/49% (p <0.05), and HDL cholesterol >1.0 (males) and >1.2 (females) mmol/l: 59%/61%. Use of medication: antihypertensives: 94%/94%; lipid-lowering drugs: 85%/86%; and aspirin: 89%/88%. High prevalences of adverse lifestyle characteristics were found: overweight (BMI $\geq$25 kg/m^2): 85%/86%; obesity (BMI $\geq$30 kg/m^2): 42%/44%; waist circumference $\geq$102 cm (men) or $\geq$88 cm (women): 69%/68%, exercise <3 times/week: 55%/56%, and smokers in age group <65 years: 19%/20%.

Conclusions Treatment targets in secondary prevention of CHD among people with type 2 diabetes in Sweden have not been met for up to 60% in 2005, and prevalences of obesity and smoking were high. It is important that evidence-based approaches are applied to management of cardiovascular risk factors among people with diabetes.

Keywords: Coronary heart disease, diabetes mellitus, hypertension, hyperlipidaemia, secondary prevention.

Introduction

The risk of coronary heart disease (CHD) is substantially increased in patients with type 2 diabetes [1, 2]. In addition, the mortality one year after CHD is higher in patients with as compared to without diabetes [3]. Glycaemic control can reduce the risk of microvascular endpoints [4], and MI if metformin is used [5]. The importance of treatment with antihypertensive drugs, lipid-lowering drugs and antiplatelet drugs for primary prevention of cardiovascular disease has also been documented [6-8]. Recently the benefit of statin use in patients with diabetes was high-lighted in a meta-analysis by the Cholesterol Treatment Trialists´ (CTT) Collaborators [9].

The Swedish National Diabetes Register (NDR) was initiated in 1996 as a tool for quality assurance in diabetes care, with reports of patient data from hospital outpatient clinics and primary health care (PHC) centres nationwide. A more detailed description of the NDR and Swedish diabetes care has been published previously [10-15]. It offers a unique possibility to survey the treatment and risk factor control in patients with diabetes based on data from everyday clinical practice.

The aim of this study was to examine risk factor management in 2005 among type 2 diabetic patients with first incident of CHD, by a comparison between patients from the NDR who had CHD 1-2 years previously or CHD 3-7 years previously, and by a comparison between sexes.

Patients and methods

Reporting to the NDR is based on information collected during patient visits at hospital outpatient clinics and PHC centres all over Sweden. This is carried out by trained nurses or physicians via the Internet (www.ndr.nu), by transferral of data from clinical records databases or by use of a printed form. All information is subsequently stored in a central database, and participating centres receive an annual report with local results compared with national for feed-back. Ninety-five percent of all hospital diabetes outpatient clinics and 75

percent of all PHC centres in Sweden participated in the NDR during 2005. The mean numbers of reported patients were 402 and 144 per participating unit, respectively. Reporting to the NDR is not mandatory, but hospital outpatient clinics and PHC centres nationwide are encouraged to participate. All patients gave informed consent before agreeing to be included. The Regional Ethics Committee at the University of Gothenburg approved the study. Reports concerning the national data have been previously published by the Working Group of the NDR, describing trends in risk factor control, also including a more detailed description of the Swedish health care system for patients with diabetes [10-15].

This study concerns 1719 female and male type 2 diabetic patients (age 18-79 years) with first incident of nonfatal CHD 1-2 years before follow-up in 2005, and 3843 female and male type 2 diabetic patients (age 18-79 years) with first incident of CHD 3-7 years before follow-up in 2005, and with data available in the NDR for an analysis of risk factors in 2005. All patients had diabetes when the CHD event occurred. The first period was chosen to allow for a comparison with the EUROASPIRE study, and the second period was added to allow for a comparison with patients who had a CHD event during another five-year period before the first period. About 80% of the patients in this study were treated at PHC centres. The definition of type 2 diabetes applied was treatment with diet only, or treatment with oral hypoglycaemic agents, or with insulin only or insulin combined with oral agents and age 40 years or more when diabetes was detected.

Registered variables were age, sex, onset age of diabetes, type of hypoglycaemic treatment, HbA_{1c}, body mass index (BMI), waist circumference, physical leisure time activity, blood pressure (BP), blood lipids, smoking, microalbuminuria, and use of antihypertensive drugs, lipid-lowering drugs and aspirin (acetylsalicylic acid). BMI (kg/m^2) was calculated as $weight/height^2$. Waist circumference (cm) was measured horizontally at the level of the umbilicus, at the end of expiration when standing. Regular physical leisure time activity was defined as regular exercise three times per week or more. A smoker was defined as a patient regularly smoking one or more cigarettes daily, or who had stopped smoking within the past three months. The Swedish standard recommendation for BP recording is the mean value of

two readings (Korotkoff 1–5) in the supine position using a cuff of appropriate size, and was further endorsed by the NDR according to national guidelines (National Board on Health and Welfare. Stockholm 1999).

Laboratory analyses were carried out at local laboratories. HbA_{1c} has been quality assured since 1996 in Sweden. All Swedish diabetes outpatient clinics and primary care centres use methods regularly calibrated to the HPLC Mono-S method. In this report, measured HbA_{1c} values were converted to the DCCT standard values using the formula: HbA_{1c} (DCCT) = 0.923 x HbA_{1c} (MonoS) + 1.345 (R^2=0.998) [16]. LDL cholesterol values were calculated using Friedewald's formula: (LDL cholesterol = total cholesterol – HDL cholesterol – (0.45 x triglycerides), if triglycerides <4.0 mmol/L. Microalbuminuria was defined as urine albumin excretion 20-200 µg/min in two out of three consecutive tests, and macroalbuminuria as urine albumin excretion >200 µg/min.

Current treatment goals for cardiovascular risk factors have been applied, as recommended by European guidelines [17] and the American Diabetes Association [18]: HbA_{1c} <7.0% (DCCT standard); BMI <25 kg/m^2; waist <94 cm (men) or <80 cm (women); BP <130/80 mm Hg; total cholesterol <4.5 mmol/L, LDL cholesterol <2.5 or $\leq$1.8 mmol/L, non-HDL cholesterol $\leq$3.4 mmol/l, triglycerides <1.7 mmol/L, and HDL-cholesterol >1.0 mmol/L (men) or >1.2 mmol/L (women).

The 5-year risk of cardiovascular risk (CVD: CHD or stroke) was estimated with use of the NDR risk equation in type 2 diabetic patients, a more simplified risk equation based on easily available non-laboratory predictors in clinical practice (age, sex, diabetes duration, BMI, smoking, systolic BP, antihypertensive and lipid-lowering drugs as predictors) and HbA1c, and elaborated in a large observational study obtained from type 2 diabetic patients on routine treatment in Sweden with age up to 70 years, as previously described (19).

Definition of coronary heart disease events

A first incident non-fatal CHD event, occurring between 1995 and 2001 in patients followed-

up in 2002, and occurring between 1998 and 2004 in patients followed-up in 2005, was defined as first incident non-fatal myocardial infarction (ICD10-code I21), unstable angina pectoris (ICD10-code I20.0), or percutaneous transluminal coronary intervention (PCI) and/or coronary artery by-pass grafting (CABG), whichever came first. The CHD events were retrieved by data linkage with the national Swedish Hospital Discharge Register (National Board of Health and Welfare, Stockholm).

Statistical methods

Results are presented as mean values ± one standard deviation (SD) or frequencies in Tables 1-3. Significance levels were adjusted for differences in age and sex by multivariate and logistic regression. Multivariate regression was used in Table 4 to analyse the association between time (years) from CHD event to follow-up in 2005 as dependent variable, and risk factor levels at follow-up in 2005 as independent variables. A p-value less than 0.05 was considered statistically significant. All statistical analyses were performed using JMP version 5.1 (SAS Institute, NC).

Results

Patients with CHD 1-2 years previously

Mean age was 67$\pm$8 years, 68% were males, and mean diabetes duration was 9$\pm$8 years at follow-up in 2005 (Table 1). The proportion of treatment with oral hypoglycaemic agents was 59%, and as many as 44% had insulin. The current HbA_{1c} target <7% was achieved by 54%, while as many as 81% reached HbA1c <8%. Achievement of blood lipid level targets are given in Table 2: total cholesterol <4.5 mmol/L by 59%, LDL cholesterol <2.5 mmol/L by 66%, non-HDL cholesterol $\leq$3.4 mmol/l by 68%, triglycerides <1.7 mmol/L by 52%, and HDL cholesterol >1.0 mmol/L (males) or 1.3 mmol/L (females) by 59%. This was accompanied by a high proportion of patients using lipid-lowering drugs (mainly statins), 85%.

The proportion of antihypertensives was high, 94%, but BP ≤130/80 mmHg was achieved by only 39%, and the current BP target <130/80 mmHg by even less, 24%. While diastolic BP ≤80 mmHg was reached by 81%, only 42% reached systolic BP ≤130 mmHg. The use of aspirin was high, 89%.

Comparatively concerning lifestyle characteristics, mean BMI was high, 29.6 kg/m^2, only 15% reached the target BMI <25 kg/m^2, and the frequency of obesity (BMI ≥30 kg/m^2) was high, 43% . Few patients, 10%, reached the current target for waist circumference, and only 31% a less stringent target. Furthermore, the proportion of smokers was 13% in all patients, and as many as 19% in a subgroup of patients with age less than 65 years. Physical exercise was performed regularly three times per week or more in around half of the patients.

The mean estimated 5-year risk of CVD was 18%, with 17% of all below risk <10% and 65% below risk <20%.

Patients with CHD 3-7 years previously

Comparing patients with CHD 3-7 years before follow-up to those with CHD 1-2 years before follow-up (Table 1), no significant differences were seen regarding hypoglycaemic treatment or achievement of targets for HbA1c, BP and life style characteristics. Concerning targets for blood lipids, significantly less patients achieved targets for total cholesterol, non-HDL cholesterol, triglycerides and total /HDL cholesterol among patients with CHD 3-7 years previously. The mean 5-year risk of CVD was slightly higher, with less patients below risk <10% and <20% ($p < 0.05$-0.01).

Gender differences

Comparing women and men in 2005 with CHD 1-2 years previously (Table 3), women had higher mean HbA1c, BMI, blood lipids, and less regular exercise than men, while women had lower mean diastolic BP, waist and microalbuminuria. No significant differences were seen

regarding hypoglycaemic treatment, mean systolic BP, smoking, use of antihypertensive drugs, lipid-lowering drugs or aspirin. The mean 5-year risk of CVD was higher in men than women, 19 versus 15%, and less men were below risk <10% and <20. The same picture was seen when comparing women and men with CHD 3-7 years previously.

Years passed since CHD event versus risk factor control

Multiple regression analysis was used to investigate the association between time (years) from first incident CHD to follow-up as dependent variable and risk factor status in 2005 as independent variables, see Table 4. Median (range) years was 4 (1-7). It was found that the number of years from CHD to follow-up was significantly associated with levels of total cholesterol, smoking and BMI (positively) and HDL cholesterol (negatively). Thus, levels of these risk factors deteriorated with longer time from CHD to follow-up. Levels of HbA_{1c} and BP, however, did not deteriorate with time.

Discussion

The implementation of evidence-based therapies [17,18] and optimised risk factor control is especially important in patients with the combination of diabetes and CHD, as potential health benefits are proportional to risk factor levels achievement and the proportion of patients treated with drugs such as statins [9].

This study demonstrated that the current treatment targets for blood lipids were achieved by around 60% of the patients with combination of type 2 diabetes and CHD in 2005, while the current targets for blood pressure control and glycaemic control (HbA1c) were reached by about 40-50% of the subjects. A high prevalence of adverse lifestyle characteristics was found, mean BMI and waist circumference were high, obesity was present in more than 40%, and a high waist circumference above target level in 70%. As

many as around 20% of patients aged <65 years continued to smoke in 2005, and only around 50% exercised regularly three times per week or more.

A high proportion of use of lipid-lowering drugs (almost exclusively statins) was found in patients with CHD 1-2 years previously, 85%. This was accompanied by the achievement of current targets for total cholesterol, LDL cholesterol and non-HDL cholesterol in as many as 60-68% of these patients, Current triglycerides and HDL-cholesterol targets were attained by more than 50%, although statins do not have their main effect on these blood lipids variables. Both triglycerides and HDL-cholesterol have been verified as risk factors for cardiovascular disease, and are also indicators of dyslipidaemia associated with insulin resistance [20, 21]. Concerning patients with CHD 3-7 years previously, targets for total, non-HDL, LDL cholesterol and triglycerides, were somewhat and significantly less frequently achieved, compared to patients with CHD 1-2 years previously. Multivariate regression showed that total cholesterol levels were higher and HDL cholesterol levels lower with longer time from CHD event to follow-up.

As many as four-fifths of patients with CHD reached a less stringent HbA_{1c} target <8.0% in patients with CHD 1-2 years previously. However, only half of the subjects reached the current HbA_{1c} target <7.0%. No significant differences were seen regarding these targets between patients with CHD 1-2 or 3-7 years previously. Strongly intensified lifestyle measures and possible use of weight-reducing therapies seem necessary in order to obtain a higher achievement of the current HbA_{1c} target, also with regard to the high proportion of obesity. Regular exercise 30 min twice per week has been shown to reduce cardiovascular risk by 30% in patients with hypertension [22].

Although almost all patients with CHD 1-2 years previously were treated with antihypertensive drugs in 2005, only 39% reached the BP target $\leq$130/80 mmHg. Even less (24%) reached the current target <130/80 mmHg. It was clearly demonstrated that the systolic BP target $\leq$130 mmHg was difficult to reach (42%), while diastolic BP $\leq$80 mmHg was obtained by as many as 81%. No significant differences were seen regarding BP levels between patients with CHD 1-2 or 3-7 years previously. More evidence-based use of

antihypertensive drugs seems necessary, also suitable to decrease a high systolic BP level. This necessity was also underlined by the finding that almost one-fifth had microalbuminuria, a marker of greatly increased cardiovascular morbidity and mortality in patients with type 2 diabetes [13, 23].

Mean estimated 5-year risk in all patients, 19%, was higher than in ~11.000 Swedish type 2 diabetic patients with no previous CVD, 12% (19), based on clinical parameters and HbA1c, although not taking into account the increase in risk due to previous CHD.

Some previous surveys have analysed risk factor management in diabetic patients with coronary artery disease [24-27]. The EUROASPIRE II Study was carried out in 1,086 male and female type 2 diabetic patients (mean age 63 years) with CHD 1-2 years before follow-up in 1999-2000 [25]. Considerably more patients with CHD 1-2 years before 2005 in this study reached current targets for total cholesterol and LDL-cholesterol, 60% and 66%, than in EUROASPIRE II, 29% and 25%. Accordingly, 84% used lipid-lowering drugs in the Swedish study, while only 62% in EUROASPIRE II. However, the achievement of BP <130/80 mmHg was similar in both studies, 24% versus 23%, in spite of a high use of antihypertensive drugs in both studies, 94% versus 92%, respectively. Furthermore, many patients were still smoking in both studies, 12% versus 17%. The recent Euro Heart Survey on Diabetes and the Heart examined 1524 diabetic patients with coronary heart disease from 25 countries in 2003, and found that only 30% achieved the BP target <140/90 mmHg [26]. Lipid-lowering drugs were given to 66%, while only 45% reached total cholesterol <5 mmol/l and LDL cholesterol <3 mmol/l.

Comparatively in this study in 2005, 84% had lipid-lowering drugs, and around 80% achieved these two lipid targets (data not given in Results).

In Swedish patients with diabetes and myocardial infarction, the national RIKS-HIA register-based study has demonstrated a clear decrease in one-year post-MI total mortality from 29.7% to 19.7% during the period 1995-2002, although still higher than in patients without diabetes, 16.6% to 12.1% [28, 29]. The relative one-year mortality risk in diabetic patients, compared with non-diabetic patients, encouragingly decreased significantly from

1.44 (1.36-1.52) in 1995-1998 to 1.31 (1.24-1.38) in 1999-2002. The RIKS-HIA study found improved pre-infarction management of cardiovascular risk factors together with increased in-hospital use of anticoagulants, statins, beta-blockers, ACE-inhibitors and early re-vascularisation to be likely contributors, although factors such as improved glycaemic control during and after the MI were not analyzed. For comparison in our study, 80% of patients with CHD reached the HbA_{1c} target <8.0%, while half of them reached the target <7.0%.

Limitations of the study

The coverage rate of the Swedish diabetic population in the NDR is still not optimal, but almost 40% of all type 2 diabetic patients in Sweden were registered in 2005. A possible bias that centers with particular interest in diabetes care might report more patients in the early development of a national register was not probable in this study, as the NDR was started as early as in 1996. Patients excluded due to missing data regarding the HbA1c and BP variables were 10% of all available patients, with similar mean age and male rate (67±8 years and 65%). Concerning the number of participants with CHD 1-2 years previously, it was larger in this study from one country than comparable participants in EUROASPIRE I and II from 15 countries, 1086 and 641, respectively (25). We believe that data regarding onset age of diabetes, continuous risk factor variables and use of drugs were reliable in this study. Smoking might be somewhat biased due to under-reporting by patients or examiners. We also believe data concerning end-point events to be reliable as all events were diagnosed during treatment at hospitals reporting to the national Mortality Register and the Hospital Discharge Register, and CHD defined by combining data from these registers is an efficient validated alternative to revised hospital discharge notes and death certificates [30].

The strength of this study was supported by the fact that the numbers of patients and events were relatively high, and that patients in the NDR were collected from the general Swedish diabetes population at PHC centres and hospital diabetes clinics nationwide. Similar trends of improved control influencing prognosis has recently also been reported from another related Swedish register study, RIKS-HIA [29].

In conclusion, the high proportion of lipid-lowering drugs prescribed in patients with CHD was accompanied by achievement of blood lipid targets in around 60% of the patients. Yet, considerable problems remain in achieving current treatment goals for BP and HbA_{1c}. The high prevalence of adverse lifestyle characteristics, such as obesity, high waist circumference and smoking, with their tendency to aggravate with longer time since the CHD event, contributes to this situation. Intensified use of structured programs, evidence-based drug medication, and professional lifestyle intervention support, similar to what was applied in the Steno-2 trial regarding primary prevention of cardiovascular disease [31], seems urgent in these patients with a high risk for future cardiovascular events including re-infarction.

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Conflict of Interest Statement: none of the authors have declared a conflict of interest.

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Table 1. Clinical characteristics and risk factors in 2005, in 5348 type 2 diabetic patients with CHD.

	CHD 1-2 years previously (n=1719)	CHD 3-7 years previously (n=3843)	P value [a]
Years from CHD to follow-up	1.5±0.5	4.9±1.4	<0.001
Age, years	67.3±8.1	67.7±7.7	n.s.
Male gender, %	67.8	70.2	<0.001
Diabetes duration, years	9.1±7.6	9.4±7.4	n.s.
Diet/oral agents/insulin, %	19/59/44	20/59/43	n.s.
HbA1c, %	7.12±1.16	7.17±1.14	n.s.
HbA1c <8.0, %	81.4	80.3	n.s.
HbA1c <7.0, %	54.0	51.9	n.s.
Antihypertensive drugs, %	93.8	93.6	n.s.
Systolic BP, mmHg	138.0±18.7	138.0±18.1	n.s.
Diastolic BP, mmHg	75.1±9.8	75.1±9.7	n.s.
Pulse pressure, mmHg	62.9±16.7	62.9+16.1	n.s.
Diastolic BP ≤80 mmHg, %	81.4	80.6	n.s.
Systolic BP ≤130 mmHg, %	41.6	40.2	n.s.
BP ≤130/80 mmHg, %	39.2	37.8	n.s.
BP <130/80 mmHg, %	23.6	22.1	n.s.
BMI, kg/m^2	29.6±4.8	29.8±5.1	<0.05
BMI <30 kg/m^2, %	57.5	56.3	n.s.
BMI <25 kg/m^2, %	15.4	14.2	n.s.
Waist circumference, cm	104.7±12.3	104.5±12.7	n.s.
Waist <102 men, <88 women	30.8	31.9	n.s.
Waist <94 men, <80 cm women	9.6	11.0	n.s.
Exercise ≥3 times per week, %	45.1	43.8	n.s.
Non-smokers, %	88.4	87.8	n.s.
Non-smokers age <65 yrs, %	81.0	79.5	n.s.
Aspirin use, %	88.5	87.5	n.s.
Microalbuminuria, %	17.5	19.0	n.s.
Macroalbuminuria, %	14.9	14.5	n.s.
Age ≤70 yrs: 5-year risk CVD, %	17.9±8.4	18.8±8.3	<0.01
5-year risk CVD <10%, %	17.1	13.1	<0.01
5-year risk CVD <20% %	64.9	60.4	<0.05

Mean±SD values and frequencies (%) are given. BP: Blood pressure. CVD: Cardiovascular disease (CHD or stroke) [a] Adjustment for age and sex, n.s.: p >0.05. Numbers were less than all included patients due to some missing data regarding BMI (93%), smoking (89%), 5-year risk CVD (81%), exercise (72%), albuminuria (70%), waist (33%).

Table 2. Blood lipid values in 2005, in 5135 type 2 diabetic patients with CHD.

	CHD 1-2 years previously (n=1590)	CHD 3-7 years previously (n=3545)	P value [a]
TC, mmol/L	4.35±1.00	4.41±0.93	<0.05
TC <4.5 mmol/L, %	59.1	55.5	<0.01
LDL-C, mmol/l	2.30±0.83	2.34±0.798	n.s.
LDL-C <2.5 mmol/L, %	65.7	62.6	<0.05
LDL-C ≤1.8 mmol/L, %	28.3	25.0	<0.05
Non-HDL-C, mmol/l	3.11±0.97	3.19±0.92	<0.01
Non-HDL-C ≤3.4 mmol/l, %	68.0	64.8	<0.05
TG, mmol/L	1.91±1.19	1.97±1.21	<0.05
TG <1.7 mmol/L, %	52.4	49.2	<0.05
HDL- C, mmol/L	1.24±0.39	1.22±0.35	n.s.
HDL-C >1.0 M, >1.2 F, %	59.2	60.7	n.s.
TC / HDL-C	3.7±1.18	3.83±1.29	<0.05
LDL-C / HDL-C	1.99±0.88	2.04±0.94	n.s.
LDL-C / HDL-C <3, %	87.5	88.3	n.s.
Lipid-lowering drugs, %	85.1	85.9	n.s.

Mean±SD values and frequencies (%) are given. TC: Total cholesterol, LDL-C: LDL-cholesterol, Non-HDL-C: Non-HDL cholesterol, TG: Triglycerides, HDL-C: HDL-cholesterol, M: males, F: Females.
[a] Adjustment for age and sex, n.s.: p >0.05. Due to some missing data, numbers were less than in Table 1, and were less than all included patients in Table 2 regarding TG (91%), HDL-C, non-HDL-C, TC/HDL-C (89%), LDL-C and LDL/HDL-C (83%).

Table 3. Clinical characteristics and risk factors in 2005, in type 2 diabetic patients with CHD, by gender.

	CHD 1-2 years previously			CHD 3-7 years previously		
Characteristics and risk factors	Men (n=1165)	Women (n=554)	P value	Men (n=2698)	Women (n=1145)	P value
Age, years	66.6±8.1	69.0±7.8	<0.001	67.2±7.8	68.9±7.5	<0.001
Duration, years	8.8±7.4	9.4±7.8	n.s.	9.1±7.3	9.8±7.6	n.s.
Diet/oral/insulin, %	19/58/43	18/60/46	n.s.	20/60/41	19/58/47	n.s.
HbA1c, %	7.08±1.14	7.19±1.17	<0.05	7.15±1.12	7.24±1.15	<0.05
BP lowering drugs, %	93.1	95.1	n.s.	93.0	94.9	n.s.
Systolic BP, mmHg	137.5±18.8	139.1±18.6	n.s.	137.7±17.7	138.8±19.1	n.s.
Diastolic BP, mmHg	75.7±9.7	73.9±9.7	<0.05	75.9±9.6	73.1±9.8	<0.001
BMI, kg/m^2	29.2±4.5	30.3±5.4	<0.001	29.5±4.9	30.6±5.6	<0.001
Waist, cm	105.9±12.0	101.9±12.7	<0.01	105.8±12.0	101.1±13.9	<0.001
Exercise ≥ 3/week, %	48.1	38.5	<0.01	47.7	34.5	<0.001
Non-smokers, %	87.8	89.4	n.s.	87.7	88.0	n.s.
Aspirin, %	88.2	89.2	n.s.	87.2	88.2	n.s.
Microalbuminuria, %	18.6	14.9	<0.05	20.1	16.4	<0.01
Macroalbuminuria, %	15.8	12.8	n.s.	15.8	11.5	<0.01
Age ≤70 years:						
5-year risk CVD, %	19.1±8.7	14.5±6.7	<0.001	20.2±8.4	14.9±6.7	<0.001
5-year risk <10%, %	13.5	26.6	<0.001	8.6	25.9	<0.001
5-year risk <20% %	59.2	80.1	<0.001	54.0	78.6	<0.001
Blood lipids	Men (n=1079)	Women (n=511)	P value	Men (n=2502)	Women (n=1043)	P value
TC, mmol/L	4.24±0.97	4.59±1.04	<0.001	4.34±0.93	4.58±0.93	<0.001
TG, mmol/L	1.88±1.22	1.98±1.14	n.s.	1.92±1.24	2.09±1.13	<0.001
HDL-C, mmol/L	1.18±0.37	1.35±0.40	<0.001	1.18±0.33	1.32±0.37	<0.001
LDL-C, mmol/L	2.25±0.79	2.41±0.90	<0.01	2.33±0.77	2.37±0.82	n.s.
Lipid lowering drugs, %	85.6	85.0	n.s.	85.4	97.1	n.s.

Mean±SD values and frequencies (%) are given. BP = Blood pressure, TC: Total cholesterol, LDL-C: LDL-cholesterol, TG: Triglycerides, HDL-C: HDL-cholesterol. Numbers were less than all included patients due to missing data regarding some of the variables as given in Tables 1-2.

Table 4. Multiple regression analysis in 3,447 patients with type 2 diabetes describing the association between time (median 4 years, range 1-7 years) from first incident CHD to follow-up in 2005 as dependent variable, and risk factor levels in 2005 as independent variables.

	Dependent variable: Years from CHD to 2005		
Independent variables:	Estimate±SE [a]	t ratio	P value
Total cholesterol	0.161±0.042	3.9	<0.001
Smoking	0.171±0.054	3.2	<0.01
BMI	0.015±0.007	2.0	<0.05
HbA1c	0.045±0.033	1.4	n.s.
Diastolic BP	0.005±0.004	1.3	n.s.
Triglycerides	-0.014±0.035	-0.4	n.s.
Systolic BP	-0.004±0.002	-1.8	n.s.
HDL-cholesterol	-0.256±0.106	-2.4	<0.05

[a] Predictors were adjusted for each other and for age, sex and diabetes duration.