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<th>Established cardiovascular disease and CVD risk factors in a primary care population of middle-aged Irish men and women</th>
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Abstract

Contemporary Irish data on the prevalence of major cardiovascular disease (CVD) risk factors are sparse. The primary aims of this study were (1) to estimate the prevalence of major cardiovascular disease risk factors, including Type 2 Diabetes Mellitus, in the general population of men and women between the ages of 50 and 69 years; and (2) to estimate the proportion of individuals in this age group at high absolute risk of cardiovascular disease events on the basis of pre-existing cardiovascular disease or as defined by the Framingham equation. This survey employed composite risk scoring to provide an estimate of the absolute risk of major CVD events using the original Framingham Risk Equation.

Material and Methods

The Cork and Kerry Diabetes and Heart Disease Study is a cross-sectional study based in primary care. Participants were drawn from the practice lists of 17 general practices affiliated with the Cork Training Programme for General Practice. These practices are broadly representative of the socio-economic profile of the area, with six urban and 11 rural practices. Candidates were invited by letter, co-signed by their participating GP, explaining the aims of the study and accompanied by a reply slip and detailed questionnaire. Non-responders were followed up with a phone call where possible and otherwise with a single postal reminder.

Pre-existing cardiovascular disease was determined by a self-reported history of myocardial infarction or angina (and/or a history of a Coronary Artery Bypass Graft or Coronary Artery Angioplasty) or a positive "Rose Questionnaire"18 or a history of a stroke, peripheral vascular disease or abdominal aortic aneurysm or where there was evidence of previous Myocardial Infarction (MI) on an analysis of the electrocardiograms (ECG) by an experienced cardiologist. Two questionnaires were designed for the purpose: (1) a self-administered questionnaire on vascular disease or abdominal aortic aneurysm or where there was evidence of a previous MI; (2) a questionnaire on diabetes mellitus, incontinence, gastrointestinal symptoms, stroke and peripheral vascular disease and to determine mean systolic and diastolic blood pressure, height and weight.

Vascular deaths accounted for 43% of all deaths in Ireland in 1997 and in the 1999 WHO MONICA Project report, of 37 centres surveyed, Belfast recorded the 4th highest coronary-event rate in men and the 2nd highest coronary-event rate in women. Contemporary data are lacking on the distribution of cardiovascular disease risk factors in Ireland and in particular, the prevalence of Type 2 Diabetes Mellitus is not well documented. Policy formulation and guidelines on the diagnosis and management of cardiovascular disease and its associated risk factors need to be informed by relevant local data.

The proportion of individuals in this age group at high absolute risk of cardiovascular disease events on the basis of pre-existing cardiovascular disease or as defined by the Framingham equation was estimated. This survey employed composite risk scoring to provide an estimate of the absolute risk of major CVD events using the original Framingham Risk Equation. The primary aims of this study were to estimate the prevalence of major cardiovascular disease risk factors, including Type 2 Diabetes Mellitus, in the general population of men and women between the ages of 50 and 69 years and to estimate the proportion of individuals in this age group at high absolute risk of cardiovascular disease events on the basis of pre-existing cardiovascular disease or as defined by the Framingham equation. This survey employed composite risk scoring to provide an estimate of the absolute risk of major CVD events using the original Framingham Risk Equation. The primary aims of this study were to estimate the prevalence of major cardiovascular disease risk factors, including Type 2 Diabetes Mellitus, in the general population of men and women between the ages of 50 and 69 years and to estimate the proportion of individuals in this age group at high absolute risk of cardiovascular disease events on the basis of pre-existing cardiovascular disease or as defined by the Framingham equation. This survey employed composite risk scoring to provide an estimate of the absolute risk of major CVD events using the original Framingham Risk Equation.
The Ethics Committee of the Cork Teaching Hospitals approved the study protocol.

Results

Men accounted for 48.2% of participants in the study. Overall, 42% of the female population and 52% of the male population were overweight while 26% of the female population and 25% of the male population were obese. The proportion of overweight and obese individuals were broadly similar between age strata (50–54, 60.5% of women aged 65−69). The prevalence rate was higher in males and in the older age groups. In males 65 years or older, over 13% had either Type 2 DM or IFG. The corresponding prevalence rate for women in this age group was 7%.

The prevalence rate for Type 2 Diabetes Mellitus was 3.9% (95% CI 2.9 − 5.4) and the prevalence rate was higher in males and with increasing age. A total of 114 of these individuals had a documented history of hypertension and were on antihypertensive medication. Only 74 (41%) of individuals in this latter group had blood pressure readings below 140/90, the current target level recommended in international guidelines16,17. A total of 9 (0.8%) individuals had left ventricular hypertrophy by ECG criteria.

The overall prevalence of pre-existing cardiovascular disease was 13.5% (137/1018). The prevalence rate was higher in males, and with increasing age. A total of 114 of these individuals reported a history of CVD, a further 11 were detected using this study and 88 had evidence of a previous Myocardial Infarction using ECG criteria only. Of the 114 with self-reported CVD, 68% were taking aspirin, 6.1% were taking Warfarin and 23.7% were taking a statin (lipid lowering drug).

Of the 881 individuals in the primary prevention population, the Framingham risk equation identified 20 with a risk of a CHD event 30% over ten years, 19 of whom were obese, giving an overall population prevalence of 2.0% (95% CI 1.3 3.0). Considering a lower risk threshold of 10% over 10 years, 10.9% of the population would be considered to be at high risk for a CHD event, in addition to the 13.5% with pre-existing CVD. Lowering the risk threshold further, to 15% over 10 years, would include an additional 10% of the population (Figure 3).

Discussion

The burden of cardiovascular disease in Irish society is reflected in the high prevalence rates of common CVD risk factors observed in this study. Almost half of the participants were overweight and one in four was obese. Forty percent of the population reported having no physical exercise or only occasional physical exercise on a weekly basis. The prevalence of obesity in this study is higher than that reported in the 1985 Kilkenny Health Project population survey13, and is one of the highest reported in a European population sample. The Kilkenny Health Project had reported findings from a random population sample of 784 men and women aged 35 to 64 years. The mean BMI in the Kilkenny study (in those aged 55–64 years) was 26.7 kg/m2 in men and 25.9 kg/m2 in women, as compared with 28.4 kg/m2 in men and 27.3 kg/m2 in women in the same age group in the present study. The overall prevalence of obesity in the Kilkenny study was 13.7% in men and 19.0% in women, a lower prevalence than in the current study, even allowing for the different age profile of the two samples.

The 1998 National Health and Lifestyle Surveys (SLAN) carried out in the Republic of Ireland14 estimated that, in the 50–69 year age-group, 41% of this population were overweight and 15% were obese, compared with 47% and 26% respectively in the Cork and Kerry study. The SLAN study figures quoted here are based on a national postal survey with self-reported height and weight. The high proportion of overweight and obese individuals in the Irish population is similar to findings in other countries26, 27.

Lack of physical exercise is a significant factor in the increasing prevalence of both obesity and Type 2 DM10. The prevalence of smoking in this study (18.9%) is lower than that reported from the SLAN survey (25%), a difference which may be reflecting the smoking profile of the two surveys14. In the Kilkenny Health Project, the smoking prevalence was 27.8% in men and 27.1% in women.

The high proportion of this population with hypertension and the estimated numbers with undiagnosed and inadequately treated hypertension is in keeping with previously reported surveys on the detection and management of hypertension10. About 82% of the study population had a high total cholesterol concentration (> 5 mmol/l) and 75% a high-Low Density Lipoprotein (LDL) cholesterol concentration. It is interesting to note that while mean total cholesterol concentration is lower in both the men and women when compared to findings from the 55–65 year age group in the Kilkenny Health Project13, this has occurred against a background of increasing obesity.

A total of 3.9% of the population sample had Type 2 Diabetes Mellitus. The prevalence rate for Type 2 DM in this study is lower than that found in other surveys in Caucasian populations5,6,7, and other populations17. In the US there has been a 33% increase in diagnosed diabetes from 1991 to 1998 and this increase is highly correlated with the increasing prevalence of obesity18,19. Consistent with the high prevalence of CVD risk factors in this sample, over 13% of the middle-aged population of males and females had evidence of established cardiovascular disease. While there is widespread consensus on optimal management of those with pre-existing CVD, it has been documented repeatedly that management of such individuals is generally sub-optimal. There is potential for significant improvements in this area.

In estimating an individual’s risk of CHD, it is necessary to consider all the factors that might contribute to this risk rather than looking at a single risk factor in isolation. The use of composite risk scores ensures that those at highest absolute risk are targeted for intervention, thus maximising the benefit of relative risk reduction10,11.
In addition to those with pre-existing CVD, a further 2% of the population was deemed to have an absolute risk of having a first Coronary Heart Disease event 30% over 10 years using the Framingham risk equation. The absolute numbers in the "high risk" category depend on the threshold chosen to define 'high absolute risk'. If we were to adopt a risk threshold of 20% over 10 years, 10.9% of the population would be considered to be at high absolute risk of a CHD event, in addition to those with pre-existing CVD. The question of the optimal risk score for use in the Irish population merits careful consideration. Regardless of which risk score is chosen, it is crucial that we put in place mechanisms to detect and manage those with pre-existing CVD and those with an absolute risk of a first CHD event 30% over 10 years. The fact that one-quarter of the middle-aged population might be considered to be at high risk for cardiovascular disease emphasises the need for broad population-based strategies in parallel with the 'high-risk' case-finding approach. Ultimately, control of the CVD epidemic in Ireland will depend on the successful implementation of strategies to detect and manage those with pre-existing CVD and those with an absolute risk of a first CHD event 30% over 10 years.

The Cork and Kerry Diabetes and Heart Disease study was initiated in April 1997 as a collaborative project involving the Department of Epidemiology and Public Health, University College Cork, the Training Programme for General Practice, University College Cork/Southern Health Board, the Department of Medicine, Cork University Hospital, the Department of Biotechnology, and Haematology at Cork University Hospital. We thank all the GPs in the Cork Vocational Training Program for General Practice who participated in the study. The survey received financial support from Servier Laboratories (Ireland) Ltd, Bristol Myers Squibb Pharmaceuticals Ltd, Pfizer (Ireland) Ltd and Zeneha Pharma.

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