<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<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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<tbody>
<tr>
<td><strong>Author(s)</strong></td>
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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. The survey was conducted by a team of healthcare professionals in Co. Cork and Co. Kerry. The research protocol was approved by the Ethics Committee of Cork University Hospital. Full blood counts (FBC) were analysed using the Sysmex XE 2100 analyser. Lipoprotein profile and blood biochemical profile. Analyses were performed in the Haematology and Biochemistry laboratories at the Cork University Hospital. Glycosylated haemoglobin was measured using the DKA Corporation Hi-Auto A1c-814 system. Physical measurements included blood pressure, height and weight (repeated readings); waist circumference was measured. To ensure standardisation, all procedures were carried out with reference to the detailed guidelines contained in the study's "Standard Operating Procedures Manual" and all results were recorded on a standard "Clinical Report Form." The prevalence of Type 2 DM and Impaired Fasting Glucose (IFG) was estimated by measurement of fasting plasma glucose, using the revised diagnostic criteria of the American Diabetes Association (ADA) and the World Health Organisation (WHO) for use in epidemiological studies of diabetes prevalence.

Introduction

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. Evidence is emerging of benefit from treating risk factors for cardiovascular disease (CVD) at levels which are common in the Irish population, and the need to target cardiovascular disease (CVD) for primary prevention. A number of composite risk scores designed to identify those at highest absolute baseline risk have been proposed and all new models have been based on the Framingham Risk Function. The choice of a threshold also depends on the opinion that is held of the cost-benefit of preventive strategies constrained by clinical and economic realities.

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.

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" or a history of established cardiovascular disease or abdominal aortic aneurism or where there was evidence of a definite previous Myocardial Infarction (MI) on an analysis of the electrocardiographs (ECG) by an experienced cardiologist. Type 2 DM was defined using the revised diagnostic criteria of the American Diabetes Association (ADA) and the World Health Organisation (WHO). Subjects with cardiovascular disease, known diabetes mellitus or other disease, or those receiving medication, were not excluded.

Survey work was conducted between March and August 1998. Subjects with cardiovascular disease, known diabetes mellitus or other disease, or those receiving medication, were not excluded.

1018 of the 1473 who were invited to participate attended for the assessment, a response rate of 69.1%. Allowing for those who could not attend by reason of being hospitalised (N=9); out of the country (N=5); no longer alive (N=2); outside the target age group (N=2); too confused (N=1) and untraceable (N=2), the effective response rate was 1018/1456 = 70%.

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.

Subjects were overweight with a Body Mass Index (BMI = weight in kg / height in m^2) between 25 kg/m^2 and 29.9 kg/m^2 respectively, on the proportion of the population deemed to be at risk, was also estimated. The primary prevention population included all those without pre-existing CVD.
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 was broadly similar between the different age strata (Table 1). The overall prevalence of obesity among men aged 55-64 was 60.5% of women aged 65-69.

Participation in physical exercise was generally not high. A total of 40% of the study population reported being inactive or only occasionally active (Figure 2). In addition, 192 individuals (10.2%) had a history of cardiovascular disease, and 70% of men and in excess of 80% of women in all four age strata had total cholesterol concentrations greater than 5.0 mmol/l (s.d. 1.01). The total cholesterol concentration exceeded 5.0 mmol/l in a total of 836 individuals (82.2%). In the middle-aged population, 41% of this population were overweight and 15% were obese, compared with 47% and 26% respectively in the older age group. One individual had Type 1 Diabetes Mellitus. Seventy percent of all diabetics (28/40) had already been diagnosed. The prevalence rate for Impaired Fasting Glucose (IFG) was 2.5% (95% CI 1.6 – 3.6). 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 IFA. The corresponding prevalence rate for women in this age group was 7%.

The prevalence rate for hypertension was 47% (480/1018). A total of 182 (38%) of these individuals had a documented history of hypertension and were on anti-hypertensive medication. Only 74 (41%) of individuals in this latter group had blood pressure readings below 140/90, the current target level recommended in international guidelines29. 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 the Rose questionnaire only and 12 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).

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 survey24 and is one of the highest reported in a European population sample. The Kilkenny Health Project has 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.

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The 1998 National Health and Lifestyle Surveys (SLAN) carried out in the Republic of Ireland25 estimated that, in the 50-64 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.

Lack of physical exercise is a significant factor in the increasing prevalence of both obesity and Type 2 DM27.28. The prevalence of smoking in this study (18.9%) is lower than that reported from the SLAN survey (25%), a difference which may be in part due to the different age profile of the two surveys23. 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 inadequate treated hypertension is in keeping with previously reported surveys on the detection and management of hypertension33. About 82% of the study population had a high total cholesterol concentration (5 mmol/l and 75% a high Low-Density Lipoprotein (HDL) 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 Project24 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 reported in the 1998 National Health and Lifestyle Surveys (SLAN) carried out in the Republic of Ireland25. 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 obesity25.

Consistent with the high absolute risk 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-optimal29.

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 high absolute risk are targeted for intervention, thus maximising the benefit of relative risk reduction30,31.

Table 1

<table>
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<tr>
<th>Group</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>All (%)</th>
</tr>
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<tbody>
<tr>
<td>Weight:ratio</td>
<td>0.9 (men)</td>
<td>0.85 (women)</td>
<td>0.86</td>
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<tr>
<td>55-59</td>
<td>55.5</td>
<td>44.1</td>
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<tr>
<td>60-64</td>
<td>50.7</td>
<td>49.3</td>
<td>50.0</td>
</tr>
<tr>
<td>65-69</td>
<td>51.2</td>
<td>48.8</td>
<td>50.7</td>
</tr>
<tr>
<td>All</td>
<td>51.5</td>
<td>48.5</td>
<td>50.0</td>
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Lipid profile o the two samples.
References

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 Departments of Biochemistry 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 Zeneca Pharma.

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