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Angina and intermittent claudication in 7403 participants of the 2003 Scottish Health Survey: Impact on general and mental health, quality of life and five-year mortality

Sally C. Inglis [a,b,c,*], James D. Lewsey [d], Gordon D.O. Lowe [a], Pardeep Jhund [a], Michelle Gillies [d], Simon Stewart [c], Simon Capewell [e], Kate MacIntyre [d], John J.V. McMurray [a]

[a] BHF Glasgow Cardiovascular Research Centre, University of Glasgow, Glasgow, United Kingdom
[b] Faculty of Nursing, Midwifery and Health, University of Technology, Sydney, Australia
[c] Preventative Health, Baker IDI Heart and Diabetes Institute, Melbourne, Australia
[d] Institute of Health and Wellbeing, University of Glasgow, Glasgow, United Kingdom
[e] School of Population, Community and Behavioural Sciences, University of Liverpool, Liverpool, United Kingdom

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ABSTRACT

Background: Angina and intermittent claudication impair function and mobility and reduce health-related quality of life. Both symptoms have similar etiology, yet the physical and psychological impacts of these symptoms are rarely studied in community-based cohorts or in individuals with isolated symptoms.
Methods: The 2003 Scottish Health Survey was a cross-sectional survey which enrolled a random sample of individuals aged 16–95 years living in Scotland. The Rose Angina Questionnaire, the Edinburgh Claudication Questionnaire, the Short Form-12 (SF-12) and the General Health Questionnaire were completed. Self-assessed general health was reported. Survey results were linked to national death records and mortality at five years was calculated. Subjects with isolated angina or intermittent claudication and neither symptom were compared (22 participants with both symptoms were excluded); 7403 participants (aged ≥16 years) were included.
Results: Participants with angina (n = 205; 60 ± 15 years; 45% male) rated their general health worse and were more likely to have a potential mental-health problem than those with intermittent claudication (n = 173; 61 ± 15 years; 41% male). Mean (standard deviation) physical and mental component scores on the SF-12 were higher for participants with intermittent claudication relative to those with angina (physical component score: 42.3 (10.6) vs. 35.0 (11.7), $p<0.001$; mental component score: 52.3 (8.5) vs. 46.5 (11.7), $p=0.001$). There was an observed absolute difference in five-year mortality of 4.8% (angina 12.3%, 95% CI 8.5–17.6; intermittent claudication 7.5%, 95% CI 4.4–12.6) although not statistically significant ($p=0.16$).
Conclusions: Both intermittent claudication and angina adversely impact general and mental health and survival, even in a relatively young, community-based cohort.

1. Introduction

Understanding the impact of symptom burden is important in managing chronic cardiovascular disease. Intermittent claudication and angina are common symptoms of atherosclerotic disease and each considerably impair function and reduce health-related quality of life [1–5].

Intermittent claudication is a symptom of atherosclerotic narrowing of lower limb arteries, known as peripheral artery disease (PAD) and causes significant pain when mobilizing due to an imbalance of oxygen supply and demand to the skeletal leg muscle. Angina, a symptom of coronary artery disease (CAD) is the result of the same mismatch between oxygen supply and demand in the myocardium caused by atherosclerotic narrowing of the coronary arteries.

Intermittent claudication and angina have a similar etiology, both impair mobility and function yet the physical and psychological impacts of these symptoms are rarely studied in community-based cohorts [6] or compared with each other or to individuals without each symptom [2,6]. Our aim was to examine the impact of these two common symptoms of chronic atherosclerotic cardiovascular disease on self-assessed general health, likelihood of mental health problems, health-related quality of life and long-term mortality in participants with angina, intermittent claudication or neither symptom from the 2003 Scottish Health Survey [7]. Understanding the

* Corresponding author at: Faculty of Nursing, Midwifery and Health, University of Technology, Sydney, 235 Jones Street, Ultimo, PO Box 123, Broadway, New South Wales 2007, Australia. Tel.: +61 2 9514 4819; fax: +61 2 9514 4835.
E-mail address: sally.inglis@uts.edu.au (S.C. Inglis).

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impact of symptom burden is important in health services planning and tailoring and targeting health care interventions.

2. Methods

2.1. 2003 Scottish Health Survey

The 2003 Scottish Health Survey was a cross-sectional survey of a random sample (n = 8148 adults, 44% male) of the Scottish population [7,8] which focused on cardiovascular disease and risk factors and screened for angina and intermittent claudication using validated questionnaires [9,10]. Detailed information was collected on demographics, anthropometrics, somatic and psychological health, medications, physical activity, diet, self-assessed general health and health-related quality of life [7,8]. Data was collected in the participant's home in two stages; the first stage was an interviewer visit (this included completing the Rose Angina Questionnaire [9] and the Edinburgh Claudication Questionnaire [10]), and the second, a visit at home by a specially trained nurse (clinical measures such as blood pressure, blood and saliva samples) [11]. Computer-assisted interviewing was used for both the interviewer and nurse interviews [11]. A multi-stage stratified probability sampling design was used; at the first stage, postcode sectors or groups of postcode sectors were selected, and at the second stage, addresses were selected [11]. The population surveyed included people living in private households in Scotland with a registered residential address (>99% of households), but excluded those living in institutions, including nursing homes [11]. The survey included all geographical areas of Scotland where it was feasible to undertake the survey [11]. The sampling frame included postcode sectors for several islands, but excluded inhabited islands with very small populations [11]. All adults living in the household at the selected address were included in the survey sample. In total, 8148 adults were interviewed (stage 1), and of these 5444 saw a nurse (stage 2). For consenting participants, the survey has been linked to hospitalization and mortality records (adults n = 7425; 16 to 95 years of age; 44% male) [8]. These linked [11] data allow morbidity and mortality follow-up to 31 December 2008. Ethical approval for the 2003 Scottish Health Survey was obtained from the Multi-Centre Research Ethics Committee for Scotland [11].

2.2. Questionnaires and measurements

Participants completed the Rose Angina Questionnaire [9], the Edinburgh Claudication Questionnaire [10], the General Health Questionnaire (GHQ) [12], and the Short Form-12 (SF-12) [13] and rated their self-assessed general health as either 'very bad', 'bad', 'fair', 'good' or 'very good'.

Both the Rose Angina Questionnaire and the Edinburgh Claudication Questionnaire are derived from a single cardiovascular questionnaire developed by Geoffrey Rose in 1962 [14]. The Rose Angina Questionnaire [9] is a validated and reliable angina screening tool which has been used in several population-based studies of angina prevalence [15]. Evidence suggests that the questionnaire compares favorably with documented diagnosis in primary care (positive predictive value 100% for men and 78% for women) [16], but may be less favorable with cardiologist opinion (sensitivity 44%, specificity 86%, positive predicative value 56%) [17]. Nonetheless, the Rose Angina Questionnaire is a useful tool for detecting likely cases of current, but undiagnosed angina and for detecting symptomatic angina [15]. The Edinburgh Claudication Questionnaire [10], is based on the original Rose cardiovascular survey [14], but was further developed to address concerns regarding the sensitivity of the original questionnaire. The Edinburgh Claudication Questionnaire [10] has a sensitivity of 91.3% and a specificity of 99.3% when compared to physician diagnosis of intermittent claudication [10]. Both the Rose Angina Questionnaire and the Edinburgh Claudication Questionnaire grade the severity of symptoms, as either grade 1 or grade 2, with grade 2 indicating more severe symptoms (grade 2 angina: chest pain or discomfort when walking at an ordinary pace on level ground; grade 2 intermittent claudication: leg pain or discomfort when walking at an ordinary pace on the level) [9,10]. For some of our analyses both grades were combined for each symptom (intermittent claudication = grade 1 or 2; angina = grade 1 or 2). The GHQ [12] is a screening tool for identifying the presence of psychological distress and assessing mental well-being. The GHQ-12 includes 12 questions relating to participants' general level of happiness, depression, anxiety and sleep disturbance over the past four weeks. A score between 0 and 12 is generated and a score ≥4 was used in the 2003 Scottish Health Survey [7] and this study to indicate the presence of a possible psychiatric disorder [12]. Reliability coefficients of the GHQ are reported to range from 0.78 to 0.95 [18].

The SF-12 [13] is a health-related quality of life tool which assesses both physical and mental constructs of health-related quality of life. The SF-12 has been demonstrated to be reliable and valid [19]. SF-12 data were available for participants aged ≥20 years only (excludes n = 325 participants aged 16–19 years). Lower physical or mental component score means indicate worse health-related quality of life. Socioeconomic deprivation was measured using 2001 Carstairs–Morris index of deprivation [20], an area-based index measured in quintiles. The Carstairs–Morris index of deprivation is a composite index of the indicators relating to car ownership, overcrowding, unemployment and low social class (based on the National Statistics-socioeconomic Classification) from the 2001 Scottish Census [21].

2.3. Statistical analysis

Survey and mortality data were compared for participants aged ≥16 years with intermittent claudication, or angina or without either symptom. Each category of the GHQ (0, 1–3, ≥4) and self-assessed general health outcomes were compared across symptom groups using both unadjusted and adjusted ordered logistic regression. Means for the physical and mental component-scores of the SF-12 were compared across symptom groups using both unadjusted and adjusted linear regression. All-cause mortality was examined using Kaplan–Meier analysis and compared across symptom groups using unadjusted and adjusted Cox-proportional hazards models. All adjusted analyses were adjusted for the following: age, sex, marital status, socioeconomic status, education and self-reported comorbidities (hypertension, myocardial infarction, stroke, diabetes or a respiratory condition). All analyses were completed using STATA version 10.1, p-values<0.05 were considered statistically significant.

The authors of this manuscript have certified that they comply with the Principles of Ethical Publishing in the International Journal of Cardiology [22].

3. Results

3.1. Prevalence of intermittent claudication and angina

Of the 7425 adult participants, 205 (2.8%) had angina, 173 (2.3%) had intermittent claudication and 22 (0.3%) participants had both symptoms. Due to the small number of participants with both angina and intermittent claudication we excluded these from our analysis. Of the 205 participants with angina, 137 had grade 1 angina and 68 had grade 2 angina. Of the 173 participants with intermittent claudication, 99 had grade 1 intermittent claudication and 74 had grade 2 intermittent claudication.

3.2. Demographics

All baseline variables examined were significantly different ($p<0.05$) between participants with angina or intermittent claudication and participants without either of these symptoms, with the exception of the proportion of males and socioeconomic status ($p>0.05$).

There was no difference in the demographics of participants with intermittent claudication compared to those with angina with the exception of three of the five examined comorbidities which were more common in participants with angina (hypertension, $p=0.03$; previous myocardial infarction, $p=0.002$ and respiratory conditions, $p=0.001$) (Table 1). Age at which the participants completed full-time education also differed significantly between participants with intermittent claudication and angina, with a greater proportion of participants with intermittent claudication completing full-time education at an older age.

3.3. Self-assessed general health

Over seventy percent of participants without either symptom rated their general health as 'good' or 'very good' (Table 2). In contrast, 46% of participants with intermittent claudication rated their health as 'good' or 'very good' and 13% rated their health as 'bad' or 'very bad'. Only 25% of participants with angina rated their health as 'very good' or 'good' and 32% rated their health as 'bad' or 'very bad'. Participants with intermittent claudication typically rated their general health better than participants with angina, with the exception of grade 2 intermittent claudication compared to grade 1 angina.

3.4. Mental health (General Health Questionnaire)

More than one third of the participants with angina were likely to have a mental health problem (GHQ score ≥4) and these individuals were more than twice as likely to have a mental health problem relative to participants without either symptom (Table 3).