International Journal of Cardiology 192 (2015) 49–55

Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

Ischemic heart disease, prescription of optimal medical therapy and geriatric syndromes in community-dwelling older men: A population-based study

Danijela Gnjidic [a,b,c,*,1], Alexander Bennett [b,e,h,i,1], David G. Le Couteur [b,c,d], Fiona M. Blyth [b,c], Robert G. Cumming [c,f], Louise Waite [c], David Handelsman [b,d], Vasi Naganathan [b,c], Slade Matthews [b,g], Sarah N. Hilmer [b,e,h,i]

[a] Faculty of Pharmacy, University of Sydney, Sydney, NSW, Australia
[b] Sydney Medical School, University of Sydney, Sydney, NSW, Australia
[c] Ageing and Alzheimers Institute, Concord RG Hospital, Sydney, NSW, Australia
[d] ANZAC Research Institute, Concord Hospital, Sydney, NSW, Australia
[e] Kolling Institute of Medical Research, Royal North Shore Hospital, Sydney, New South Wales, Australia
[f] Sydney School of Public Health, University of Sydney, Sydney, NSW, Australia
[g] Discipline of Pharmacology, University of Sydney, Sydney, NSW, Australia
[h] Department of Clinical Pharmacology, Royal North Shore Hospital, Sydney, New South Wales, Australia
[i] Department of Aged Care, Royal North Shore Hospital, Sydney, New South Wales, Australia

ARTICLE INFO

Article history:
Received 3 October 2014
Received in revised form 24 March 2015
Accepted 7 May 2015
Available online 9 May 2015

Keywords:
Ischemic heart disease
Older people
Medication guidelines
Geriatric syndromes
All-cause mortality

ABSTRACT

Background: Guideline recommended management of ischemic heart disease (IHD) suggests the concomitant use of antiplatelet, beta-blocker, renin angiotensin system blocker and statin therapy. In older people exposure to multiple medications has been associated with adverse events and geriatric syndromes. The study aimed to investigate the use of medications for IHD in older men with and without geriatric syndromes, and whether adherence to medication guidelines impacts on adverse outcomes.

Methods: Community-dwelling men, aged ≥70 years and enrolled in the Concord Health and Ageing in Men Project were studied. Data on self-reported IHD, number of guideline recommended medications (use of four guideline medications considered optimal medical therapy) and geriatric syndromes (frailty, falls, cognitive impairment and urinary incontinence) were obtained. Cox regression was used to assess the relationship between optimal medical therapy and adverse outcomes (mortality and institutionalization), stratifying by geriatric syndromes.

Results: At baseline, 462 (27%) men self-reported a history of IHD and of these, 226 (49%) had at least one geriatric syndrome. Among men with IHD, no significant difference was observed in patterns of prescribing between those with and without geriatric syndromes. Compared to zero medications, optimal medical therapy among men with IHD was associated with lower mortality [hazard ratio, HR = 0.40 (95% CI: 0.21–0.95)] and institutionalization risk (HR = 0.31; 95% CI: 0.09–0.81). The presence of geriatric syndromes did not modify the association of increasing use of guideline recommended medications and clinical outcomes.

Conclusion: In older men with IHD, greater adherence to medication guidelines appears to be positively associated with better clinical outcomes, independent of geriatric syndromes.

1. Introduction

Ischemic heart disease (IHD) has a major negative impact on the health of older people. The prevalence of IHD in Australia is estimated to be 17% among those aged ≥75 [1]. Moreover, IHD is more common in older men than older women with 37% and 26% of men and women ≥65 years being affected by IHD, and is associated with greater morbidity in older men [1]. Previous studies have shown that geriatric syndromes such as frailty, falls, cognitive impairment and urinary incontinence are common among older people with IHD [2–5]. People with geriatric syndromes take, on average, a greater number of medicines [6] and are consequently at an increased risk of polypharmacy and adverse drug reactions, two common markers of poor clinical outcomes in the older population [7].

* Corresponding author at: Faculty of Pharmacy, Bank Building A15, Science Rd, University of Sydney, The University of Sydney, NSW 2006, Australia.
E-mail address: danijela.gnjidic@sydney.edu.au (D. Gnjidic).
[1] These authors contributed equally to the work.

http://dx.doi.org/10.1016/j.ijcard.2015.05.045
0167-5273/

Medications used in the treatment of patients with IHD aim to prevent disease progression from stable angina to acute coronary syndrome (ACS), or repeat cardiac events after an ACS. Like those in other countries [8,9], Australian guidelines recommend the concomitant use of statin, antiplatelet, angiotensin-converting enzyme inhibitor (ACEI) and beta-blocker therapy for people with IHD [10]. This is supported by a plethora of randomized controlled trials (RCTs) conducted in younger robust individuals showing these medications reduce the risk of vascular events and mortality when used as secondary prevention in IHD [11–15]. It is well documented that older people, especially those with geriatric syndromes, are often excluded from RCTs, in particular cardiology trials, due to their substantial health problems [16,17]. As well as this, it has been reported that older people with IHD who follow clinical practice guidelines may in fact be at a greater risk of harm [4]. None of the currently available clinical guidelines however make specific recommendations for older individuals.

In order to assess the effectiveness of medications taken for IHD in real-world settings, observational studies are needed [18], yet few have been undertaken addressing this question in older people with geriatric syndromes [19]. With this in mind we analyzed data from a cohort of community-dwelling older men with the following specific study objectives:

(1) To assess the prevalence of medication guideline adherence in those with and without geriatric syndromes (frailty, falls, urinary incontinence and cognitive impairment) in older men with IHD;
(2) To determine associations between adherence to IHD medication management guidelines and adverse outcomes (institutionalization, mortality) in older men with and without geriatric syndromes;
(3) To determine if any combinations of specific evidence-based medications were associated with institutionalization and mortality in this population of older men with IHD.

2. Methods

2.1. Study population

Participants were community-dwelling men enrolled in the Concord Health and Ageing in Men Project (CHAMP), Sydney, Australia. Eligible participants were those aged ≥70 years and living in the study region recruited between January 2005 and June 2007 [20]. Participants living in residential aged care facilities were excluded. The electoral roll was used to identify men eligible for the study (n = 2815), who were then contacted by phone or mail resulting in a 54% participation (n = 1511). An additional 194 men living in the study area heard about the study from friends or the local media and were recruited before receiving an invitation letter, giving a final sample of 1705 participants. For the current study, analysis was restricted to 1694 participants due to missing data on geriatric syndromes and/or medications (n = 11). Participants underwent baseline assessments, which comprised a self-completed study questionnaire and a clinical assessment that consisted of physical performance measures, neuropsychological testing, and medication inventory [21]. Participants also agreed to be contacted every 2 years for follow-up assessment. The study was approved by the Sydney Local Health District Human Research Ethics Committee Concord Repatriation General Hospital, Sydney, Australia.

2.2. IHD assessment and other comorbidities

IHD and comorbidity were assessed using participant self-report. IHD was considered present if a person reported having angina or a history of myocardial infarct/ACS/heart attack. Data on the time of the IHD diagnosis or the disease severity was not available. Reporting a history of myocardial infarct/ACS/heart attack was also analyzed as an ACS subgroup of men with IHD. Diseases that were also assessed by self-report included diabetes, hypertension, heart failure, thyroid dysfunction, osteoporosis, Paget's disease, stroke, Parkinson's disease, epilepsy, intermittent claudication, chronic obstructive lung disease, asthma, liver disease, chronic kidney disease or renal failure, cancer (excluding non-melanoma skin cancers) and arthritis [20]. Height and weight were measured and body mass index (BMI) was calculated as kilogram per square meter. The World Health Organization (WHO) criteria were used for hemoglobin levels (<13 g/dL) to define anemia among older men.

2.3. Medication assessment

A medication inventory was performed for each participant by trained study personnel during the clinic assessment. This was performed using the brown bag medication collection method, a method based on self-report in which participants are instructed to bring their prescription and over-the-counter medications into the clinic. During the clinic visit, participants were asked whether they had taken any medication in the past month. Medications were then coded using the Iowa Drug Information Service (IDIS) codes. Clinical guidelines for IHD recommend statin, antiplatelet, beta-blocker and an ACEI/angiotensin receptor blocker [18,22]. The men were categorized into five medication guideline groups based on the number of four classes of recommended medications they were taking (0, 1, 2, 3 or 4), with a score of four indicating optimal medical therapy.

2.4. Geriatric syndrome assessment

Data were obtained for four geriatric syndromes including frailty, falls, urinary incontinence and cognitive impairment, using methods previously described and validated [6,23–25]. For frailty, similar criteria were used as in the Cardiovascular Health Study (CHS). This involved objectively assessing participants for weight loss/shrinking, weakness, exhaustion, slowness and low physical activity [26]. Participants were considered frail if they obtained three or more of the five components. For weakness (defined as the lowest sample quintile for grip strength) and slowness (defined as the lowest sample quintile for walking speed), the same criterion used in the CHS was employed. However, weight loss (defined as current weight lower by ≥15% than the highest self-reported life-time weight), exhaustion (assessed using the 12-item Short Form Health Survey [27]) and low activity (defined as being in the lowest quartile of activity using the Physical Activity Scale for the Elderly [28]) were assessed using an adapted criteria. This was due to the unavailability of some measurements in this study that were used in the CHS methodology [6].

Participants were screened for cognitive impairment using the Mini Mental State Examination (MMSE) [17] and the Informant Questionnaire on Cognitive Decline (IQCODE) [18] during the baseline clinic assessment. Participants with a MMSE less than or equal to 26 and/or IQCODE greater than 3.6 were invited to have detailed clinical assessments by a study geriatrician. At a weekly consensus meeting two geriatricians, a neurologist and a neuropsychologist reviewed all medical, cognitive, informant and functional data and reached a final diagnosis of cognitive status for each participant. At the end of the screening and clinical assessments, participants were categorized as having dementia, mild cognitive impairment (MCI) or cognitively intact. Those participants with a diagnosis of dementia or MCI were classified as cognitively impaired [29]. The International Consultation of Incontinence Questionnaire (ICIQ) self-administered questionnaire was used to assess the presence of urinary incontinence. Men were classified as incontinent if they reported leaking urine at least twice a week in the past four weeks [30]. Participants who had two self-reported falls in the previous 12-months at the baseline interview were considered fallers [31]. Lastly, a participant was classified as part of the 'combined geriatric syndrome' subgroup if they had at least one of the previously mentioned