International Journal of Cardiology 145 (2010) 481–486

Contents lists available at ScienceDirect

International Journal of Cardiology

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

# Impact of medical consultation frequency on modifiable risk factors and medications at 12 months after acute coronary syndrome in the CHOICE randomised controlled trial

Julie Redfern [a,b,*], Monique Menzies [b], Tom Briffa [c], S.B. Freedman [a,b]

[a] Vascular Biology Group, ANZAC Research Institute, University of Sydney, Australia
[b] Faculty of Medicine, University of Sydney, Sydney, Australia
[c] School of Population Health, University of Western Australia, Australia

ARTICLE INFO

*Article history:*
Received 20 January 2010
Received in revised form 9 April 2010
Accepted 10 April 2010
Available online 4 May 2010

*Keywords:*
Risk factors
Acute coronary syndrome
Cardiac rehabilitation
Cardiologist
General Practitioner
CHOICE

ABSTRACT

*Background:* We aimed to determine whether the frequency of General Practitioner and Cardiologist consultations impacted on improvements in risk factors in Choice of Health Options in Reducing Cardiovascular Events (CHOICE) randomised controlled trial.
*Methods:* Retrospective subgroup analysis of single-blind randomised controlled trial. We included acute coronary syndrome survivors not accessing cardiac rehabilitation in the CHOICE trial whose General Practitioner or Cardiologist returned a visit frequency survey. The CHOICE group participated in tailored risk factor reduction packaged as clinic visit plus 3 months telephone support. Controls participated in physician-directed usual medical care. We compared total cholesterol, systolic blood pressure, smoking status, physical activity, number of modifiable risk factors and medications with frequency of medical consultations at baseline and 12 months.
*Results:* Most control and CHOICE patients saw their General Practitioner ≥5 times (85% vs 90%) and Cardiologist at least once (65% vs 57%). CHOICE patients had a significantly better modifiable risk profile (factor levels and multiples) and more patients were on evidence-based medications at 12 months compared to controls. In CHOICE, the significant reduction in total cholesterol was unrelated to medical visits but lower systolic blood pressure was significant in patients who saw their General Practitioner ≥5 compared with ≤4 times. In controls, frequency of medical visits was not associated with any changes in risk profile.
*Conclusions:* Acute coronary syndrome survivors receiving frequent medical follow-up without packaged secondary prevention had no improvement in multiple risk factors over 12 months. CHOICE patients who saw their doctors frequently were more likely to have significantly reduced systolic blood pressure and be on evidence-based medications.



## 1. Introduction

Despite widespread recommendations that all acute coronary syndrome survivors participate in a secondary prevention program [1] only the minority access existing cardiac rehabilitation programs [2,3]. Therefore, secondary prevention opportunities for extending survival, reducing cardiovascular events, decreasing revascularisation rates and enhancing quality of life [4–6] are often lost. More disconcertingly, non-attendees are less likely to believe rehabilitation is necessary [7] yet have a worse risk factor profile and knowledge at baseline than those accessing rehabilitation [8].

Contemporary meta-analyses suggest that effective secondary prevention programs can successfully reduce coronary risk factors with and without a structured exercise component [9]. Randomised controlled trials of individualised, rather than group, secondary prevention programs in Europe [10–12], the United States [13,14] and Australia [15–17] report reductions in total cholesterol and other risk factors compared to usual care. These interventions are based on individualised risk factor reduction to specified targets and generally involve telephone and/or home-based follow-up. However, at present, the optimal model for delivery of secondary prevention remains unclear and a flexible approach that targets individuals appears to be equally effective as group-based cardiac rehabilitation [9].

The frequency of medical consultations has been reported to be a precise measure of compliance with health care interventions [18]. Frequent consultations allow for regular patient–doctor communication, monitoring of disease complications [19] and influence measures

* Corresponding author. Suite 108, Level 1 Medical Centre, Concord Hospital, Hospital Road, Concord NSW 2137, Australia. Tel.: +61 409409776; fax: +612 9767 6032.
*E-mail address:* julieredfern@dodo.com.au (J. Redfern).

0167-5273/$ – see front matter © 2010 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ijcard.2010.04.035

such as mortality [20]. The BEACH (Bettering the Evaluation and Care of Health program) report in Australia found that 12% of current problems managed by General Practitioners are cardiovascular and 19% of all drug prescriptions are for cardiovascular disease with management being shared amongst General Practitioners and Cardiologists [21]. Although most of the reported individualised secondary prevention programs encourage patient–doctor interaction, it is uncertain whether the effects of the programs are related to the frequency of consultations with General Practitioners and Cardiologists. The purpose of this study was to examine the frequency of medical consultations in the Choice of Health Options for improving Cardiovascular Events (CHOICE) randomised controlled trial and to determine whether the frequency of medical visits was associated with multiple risk factor reduction and medications at one year.

## 2. Materials and methods

### 2.1. Study design

Retrospective analysis of the frequency of General Practitioner and Cardiologist consultations in the previously reported CHOICE study [16]. We surveyed General Practitioners and Cardiologists and then grouped patients according to consultation frequency and compared change in risk factors and cardiovascular medications at 1 year. The original CHOICE study was a single-blind randomised controlled trial involving 208 acute coronary syndrome survivors [16]. Patients were originally identified following admission to a metropolitan tertiary referral hospital in Sydney, with an acute coronary syndrome and no uptake of cardiac rehabilitation, between April 2003 and February 2004. Of the total 824 admissions, 378 patients were ineligible (reasons include geography, language, severe co-morbidity or death) and 446 were eligible for secondary prevention [16]. Of those eligible, 237 patients did not participate (reasons include not interested, non-contactable, self-declared language or co-morbidity, work, geography or death) and 65 participated in cardiac rehabilitation leaving 144 patients (38%, 144/381, of those eligible and not participating in rehabilitation) eventually being randomised [16]. Ethical approval was obtained from Sydney South West Area Health Service Human Ethics Committee, Concord Hospital Zone.

### 2.2. Participants and groups

In total, 144 acute coronary syndrome survivors volunteered and 72 were randomly allocated to the control group and participated in ongoing conventional care, aimed at managing their cardiovascular health as directed by their General Practitioner, ideally in consultation with their Cardiologist. The 72 patients allocated to CHOICE participated in a three-month, patient-centred modular secondary prevention program including a one-hour initial consultation and four × 10 minute (average) follow-up phone calls over three months [22,23]. The program is designed to have an individualised, structured, and case-management approach and is overseen by treating doctors.

### 2.3. Frequency of medical consultations

To assess the frequency of medical consultations we developed and distributed a survey to all General Practitioners and Cardiologists whose patients were in the CHOICE study. The survey probed for the frequency of medical consultations during the 12 month study period. The patient's General Practitioner, Cardiologist or practice staff completed the survey based on practice records.

### 2.4. Outcome measures

Baseline demographic information, risk factor assessment and cardiovascular medications were evaluated during blinded face-to-face assessment at a mean of six months post acute coronary syndrome admission and were repeated one year later. Lipids were measured on a fasting blood sample. Resting blood pressure was measured using an Omron automatic monitor. Smoking status was measured by self-report and confirmed with an Airmet Scientific micro smoking analyser. Physical activity was assessed using the 7-day international physical activity recall questionnaire [24] and obesity was calculated using the body mass index (in kg/m²) where a body mass index of ≥30 was considered obese. Cardiovascular medications were assessed by self-report. The number of modifiable cardiovascular risk factors was calculated by summing the number of risk factors each patient had above the national target [25] and included total cholesterol >4 mmol/L, systolic blood pressure >140 mm Hg, body mass index >30 kg/m$^2$, physically inactive (<150 min/week) and currently smoking. These same risk factor levels were used as the cut-off points when calculating the proportion of patients with relevant risk factors.

### 2.5. Statistical analysis

The association between the number and type of medical consultations with group allocation (control versus CHOICE), cardiovascular medications and frequency of visits to doctors were examined using SPSS for Windows (Version 16.0, SPSS Inc. Chicago, USA). Data are presented as mean and standard deviation or proportions. Baseline values for age, gender, total cholesterol, and systolic blood pressure were analysed for participants whose doctors responded versus those whom did not using independent sample *t*-tests. Differences in outcome measures between groups were compared using one-way ANOVA for continuous variables and differences in percentages between groups were assessed using a $\chi^2$ or McNemar test of patients available for follow-up. Two-tailed *p*-values of <0.05 were considered significant.

## 3. Results

Survey consultation data were obtained from General Practitioners for 77% of patients (108/140) and from Cardiologists for 91% of patients (108/118). Reasons for non-responses are summarised in Fig. 1. Cardiologist response rate did not differ

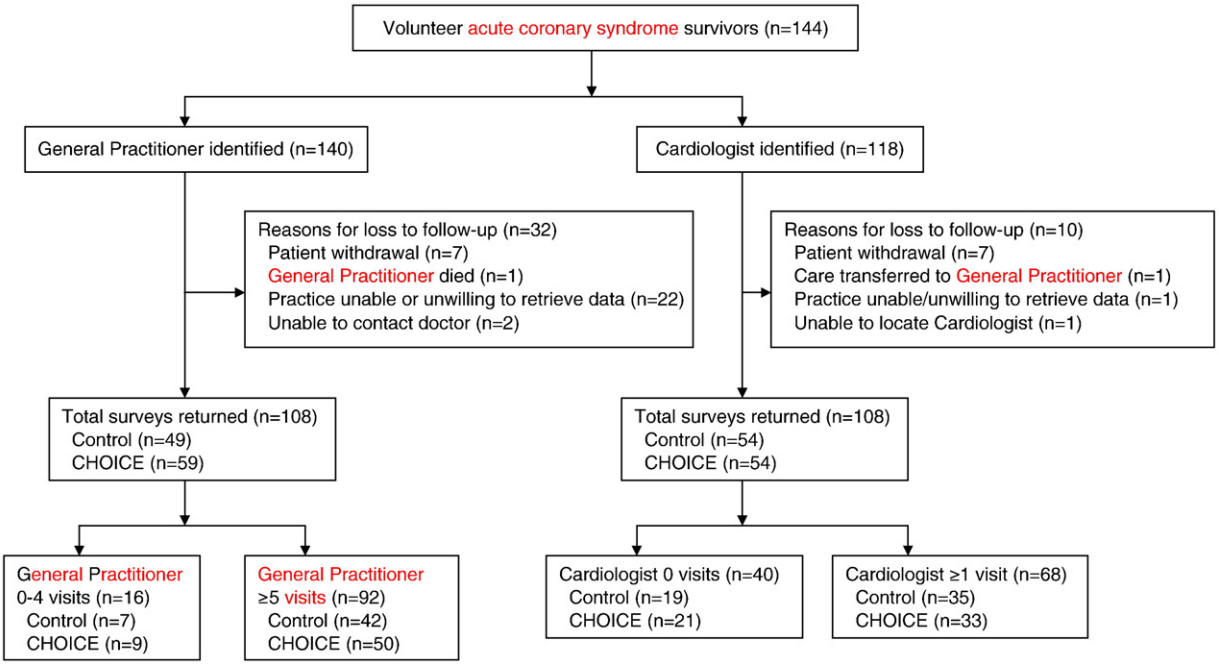


**Fig. 1.** Flow of participant follow-up.