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Evaluation of the Effectiveness of a Phone Based Care Coordination Pilot on Hospital Utilisation and Costs for Patients With Chest Pain

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Background

A small percentage of the population represents a disproportionate number of attendances at emergency departments (ED). “Frequent presenters” to ED with chest pain do not always fit into established pathways for acute myocardial events. With accelerated “rule out” protocols, patients are often discharged from the Emergency Department (ED) after short lengths of stay. This research will evaluate the effectiveness of a phone based care-coordination pilot designed to meet the needs of patients attending ED with cardiac and non-cardiac chest pain.

Methods

A longitudinal, single-arm interventional study with retrospectively recruited control group. Ninety-five patients were enrolled as the intervention group; 97 patients were retrospectively identified as controls. These patients had re-presented with chest pain within 6 months of a cardiac event, or attended hospital within 12 months two or more times with chest pain and/or complex needs. Intervention group patients were holistically assessed then phone-coached to support self-management of chest pain over 6 months. Following descriptive and univariate analysis, multivariate analysis was conducted to adjust for noted differences between the intervention and control groups.

Results

Thirty-day representation to ED was significantly less for the intervention group (14.1%) compared to controls (27.7%). After adjusting for baseline differences, intervention patients were more than two-fold less likely to re-present compared to controls (OR = 0.42, 95%CI: 0.19–0.96). After adjustment for baseline differences, the savings in subsequent inpatient costs was \$1588 per person, as a result of intervention, patients were less likely to have inpatient readmissions (16.3%) compared to controls (20.2%), although this was not statistically significant ($p = 0.588$).

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Conclusion

A phone based care-coordination pilot with targeted interventions has the potential to reduce ED presentations and hospital readmissions among patients representing with chest pain.

Keywords

Chest pain • Non-cardiac chest pain • Care coordination • Telephone based support • Emergency Department • Hospital utilisation

Introduction

Globally, chest pain related admissions are one of the top two reasons for presenting to an Emergency Department (ED). In the UK, it accounts for 6% [1] and in the US, 5.4% [2] of all presentations to hospital. In Australia, between 3.9% [3] and 4.4% [4] of the population present to an ED with chest pain. In a recent Australian study, approximately 88% patients who presented to hospital with chest pain had a diagnosis other than an acute coronary syndrome (ACS) [5]. Internationally, there have been studies designed to address the needs of patients with frequent episodes of angina [6] and non-cardiac chest pain [7]. In Australia, patients with the broad diagnosis of chest pain are not well defined or understood.

Currently in Australia, when patients present to ED with chest pain, they are subject to an algorithm defined by the 2016 National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand (NHFA/CSANZ) guidelines on the management of ACS [8]. This is a process of testing and treatment to diagnose an acute coronary event. Where an acute event is evident, patients are admitted to hospital and follow a defined pathway [8]. Where an acute coronary event is ruled out, patients tend to fall into two groups: i) those with an existing cardiac condition that have either cardiac related chest pain or atypical pain; and ii) those who have no existing cardiac condition and are classed as having non-cardiac related chest pain [1].

In busy EDs in Victoria that are funded to enforce four-hour admission targets [5], 'low risk' cardiac and non-cardiac chest pain patients are often discharged from ED with short lengths of stay [9]. In addition to funding constraints, pathways are now being designed with an accelerated process for triaging chest pain patients within two hours [10]. This may lead to less time for comprehensive discharge planning and patient education, resulting in the patient and family self-managing their illness [11]. Given the fleeting nature that characterise these presentations, patients are unlikely to be receive adequate education and advice to manage their chest pain [9].

Patients with cardiac related chest pain with no evident ACS tend to be present with angina or 'atypical pain'. These patients are considered 'low risk' [8], and despite enrolment or referral to a secondary prevention program that is best practice for patients with cardiac related issues [12], evidence suggests less than 4% of eligible patients with angina are linked into cardiac rehabilitation services [6]. These patients may not receive adequate medication prescription and advice [13], where the consequences of mismanagement include the use (and potential overuse) of emergency services [14].

Patients with non-cardiac related chest pain present to ED with a range of diagnoses, from anxiety related disorders to gastro-oesophageal disease (GORD) [1]. These require individualised and wide-ranging treatment most commonly found in primary care. These "low risk" patients may report higher levels of psychological stress and poorer quality of life, particularly with continued pain [1,2,15], and in a recent, four-year prospective study the research suggested a similar mortality to patients with cardiac chest pain [16]. This challenges the traditional view that non-cardiac chest pain has an excellent long-term prognosis.

Patients may choose an ED over another source of care (such as their local doctor) for a multitude of reasons. Often this is a pragmatic decision because of access to a primary care provider (after hours care and vicinity), out of pocket costs, transportation, child care and work related issues [17]. Or, due to the combination of increasing complexity of patients' health and associated conditions [18]. Patients in our community receive existing strong chest pain messages that encourage urgent attendance to ED [19], where attendance to ED is appropriate [20]. However, little is known about the role of primary care and chest pain attendances and this will be explored in future research.

Characteristics such as ageing, chronic conditions and possible primary care linkage issues result in intermittent and discontinuous care which may cause patients to re-present multiple times in an effort to get their needs addressed [16,21]. Considerable research directed at diverting or relocating care suggests that many of the reasons and conditions leading to presentation are potentially avoidable [22].

There is ample evidence to suggest that interventions that include care coordination strategies can improve clinical and social outcomes for patients who frequently present to hospital [23]. Additionally, telephone support programs have demonstrated a reduction in 'avoidable presentations' [24] and improvement in modifiable risk factors in patients with cardiovascular disease [25]. Telephone support has been proven as an effective model to provide education, increasing self-management skills and improving health overall in a wider patient group [26].

The Cardiac Coach Program at The Royal Melbourne Hospital (RMH) in Australia commenced in 2003 based on the Coaching On Achieving Cardiovascular Health (COACH) Program [25]. In March 2011, a gap was identified in existing services for patients with chest pain and the pilot was designed. Under the Hospital Admission Risk Program (HARP) guidelines [27], a chest pain pilot was funded to test a phone based care coordination model designed to meet the broad needs of patients with cardiac and non-cardiac chest pain. This aimed to improve the quality of care and decrease

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