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Association of processes of primary care and hospitalisation for people with diabetes: A record linkage study

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ABSTRACT

Aims: To explore the association of primary care and hospitalisation for people with diabetes.
Methods: The study comprised 20,433 diabetic participants in the Sax Institute's 45 and Up Study. Data on processes of care at recruitment (15 months) were extracted from the Department of Human Services Medicare database. Processes included continuity of primary care (47.1%), and claims for completion of an annual cycle of care (25.0%), GP management plan/team care arrangement (GPMP/TCA, 41.3%), review of GPMP/TCA (24.0%), and monitoring including HbA1c (62.7%). Hospitalisation (12 months) following recruitment was extracted from administrative data held by NSW Ministry of Health. Adjusted incidence rate ratios (aIRR) with 95% confidence interval were calculated.
Results: A hospital admission was reported for 33.0% of participants. Continuity of care (aIRR: 0.92 (95%CI: 0.89–0.96)), or claims for an annual cycle of care (aIRR: 0.77 (0.74–0.80)) or HbA1c testing (aIRR: 0.92 (0.89–0.96) were associated with a reduced likelihood of hospitalisation. While claims for preparation of GPMP/TCA were not associated with hospitalisation, a claim for review of GPMP/TCA was associated with a reduced likelihood of hospitalisation (aIRR: 0.92 (95%CI: 0.89 0.96)).
Conclusions: This study has implications for hospital avoidance programmes suggesting that strengthening primary care may be more important than care coordination for this group of patients.

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1. Introduction

Diabetes has a significant influence on rates of hospitalisation [1]. The condition is associated with early onset of chronic health conditions, increased morbidity, higher rates of hospitalisation, longer lengths of stay, and more complications of surgery [2–4]. These have direct and indirect costs for individuals as well as for health systems [3,5]. In relation to hospitalisation, diabetes is considered to be an ambulatory care sensitive condition that is amenable to ongoing care in the primary care setting. Strengthening primary care to better deliver diabetes care through the implementation of practice guidelines and financial incentives through Medicare has been a major goal of health care planners in Australia. Research has established the goals and components of diabetes care. Clinical trials have shown that early detection of diabetes through screening and implementation of proactive treatment and review are beneficial [6] Treatment regimens such as intensive treatment and control of hyperglycaemia [7–9] and dyslipidaemia [10], and lifestyle modifications [11] will delay complications of diabetes. These benefits are generally maintained [8,9,12]. There is also research evidence about the importance of good processes of care. Effective preventive and chronic disease care requires longer consultations [13,14] and continuity of provider to improve care co-ordination, reduce duplication and health care costs and ensure completion of recognised cycle of care diabetes [15]. This research has helped clinicians reach consensus on processes of care for people with diabetes and led to the publication of management guidelines suitable for implementation in primary care settings [15].

The primary care setting has a key role in the management of diabetes. Management includes targeted and systematic approaches to monitoring and managing control of glucose, blood pressure and weight, and early detection and management of diabetic complications as well as providing holistic care for other health conditions [16]. These elements of care, together with recommendations for their frequency, are considered quality process for diabetes care [15]; and together they comprise an annual cycle of diabetes care [17]. Implementation of these processes may in turn impact on hospitalisation [18–20]. Recent policy initiatives in Australia are based on financial incentives to general practitioners (GPs) and other health professionals to encourage implementation of care processes. These incentives are supported by education and system support through primary care organisations which aim to encourage implementation of 'best practice' standards [21]. However the emerging literature suggests that the relationships between implementing 'best practice' processes of primary care and health outcomes are complex. Implementation of processes of diabetes care are variable in clinical practice [22], are influenced by other factors such as patient characteristics, ease of access, co-morbidities, and secondary care, and variably impact on health outcomes [23–26].

In Australia, the cost of patients attending general practitioners (GPs) is subsidised through Medicare, Australia's universal health insurance scheme. Under Medicare GPs receive a number of supplementary payments for implementing comprehensive primary care. These include systems of care for chronic disease such as preparing a GP management plan, or involving other health professionals in multidisciplinary care and specifically for diabetes such as completion of an annual cycle of diabetes care. To our knowledge there are few studies that have investigated the impact of these incentives on care outcomes, including hospitalisation. A preliminary study using linked data from general practice suggested that it may be the processes of care rather than actual control of biological indicators such as HbA1c that contribute to improved outcomes of diabetes such as reduced hospitalisation [27].

The aim of this study was to explore the association between receipt of processes of care in general practice and hospital admission rates among a community dwelling older cohort of men and women with diabetes. The study was informed by previous research that identified and enabled adjustment for a number of known risk factors for hospitalisation among participants with and without diabetes [1]. In undertaking this study, the authors hypothesised that participants who received 'best practice' processes of care in general practice would have fewer all-cause hospital admissions.

2. Materials and methods

This was a record linkage study. Individual health records were extracted from four data sources.

2.1. *Data sources*

2.1.1. *45 and Up Study*

The Sax Institute's 45 and Up Study comprises more than 267,000 community dwelling New South Wales (NSW), Australia residents aged 45 years or older at recruitment; 24,151 participants reported a diagnosis of diabetes. Details of their recruitment and our identification of participants with diabetes [28] have been previously reported. This study accessed data collected from a questionnaire completed at recruitment (available at http://www.45andUp.org.au) and included demographic characteristics, socioeconomic status, lifestyle factors and health and wellbeing. For this study, the participant characteristics and co-morbidity used were previously shown to be associated with hospitalisation among participants with and without diabetes [1].

2.1.2. *Department of Human Services*

The Department of Human Services under Medicare processes claims for subsidised medical, specialist, some nursing and allied health care and diagnostic services provided to Australian citizens by registered medical and other practitioners through the Medical Benefits Scheme (MBS). Individuals are identified by their Medicare number, a unique patient record number based on a family number and individual person number within each family. MBS claims are coded using a system of Item Numbers listed in the MBS Schedule. For each claim processed, the MBS data includes the date of the service, Item Number of the claim (e.g. GP consultation, HbA1c test), and provider postcode.