

Short communication

Impact of patient level factors on the improvement of the ABCs of diabetes

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ARTICLE INFO

Article history:

Received 9 September 2009

Received in revised form 4 February 2010

Accepted 2 April 2010

Keywords:

Diabetes

Chronic Care Model

Behavior

ABSTRACT

Objective: To determine which patient factors contribute to improvements in the ABCs of diabetes following a multi-faceted diabetes care intervention.

Methods: A multi-level, cluster design, randomized controlled trial examined the effectiveness of a Chronic Care Model (CCM) intervention in an underserved community ($n = 119$).

Results: Improvements in glycemic control were experienced among older subjects ($p = 0.02$), those with higher scores on the WHO-10 Quality of Well-Being Subscale 1 ($p = 0.05$), and those in the CCM group ($p = 0.04$). Insulin use was associated with greater improvements in SBP and DBP. Those taking insulin ($p = 0.07$), and those more satisfied with their diabetes care and ready to make a behavior change ($p = 0.08$) experienced larger improvements in Non-HDLc. Medication treatment intensification (TI) did not significantly impact the ABCs.

Conclusion: Psychosocial and sociodemographic factors explained more of the variation in the ABCs than TI, and are important contributors to clinical improvement.

Practice Implications: Providers may be able to identify and intervene on patients who are at risk for developing diabetes complications and improve the consistency, quality, and effectiveness of patient care.

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1. Introduction

Individuals with diabetes are at increased risk for both microvascular and macrovascular complications [1–4]; however, studies show that control of A1c, blood pressure, and cholesterol (ABCs of diabetes) can significantly delay or prevent these complications [5–8]. Due to its complex nature, diabetes care benefits from a health system that promotes long-term chronic disease management [9–11], rather than episodic care. Moreover, diabetes is one of the few diseases where patients manage the majority of the disease, outside of provider control [12]. Therefore, a host of individual factors may influence a patient's control of their ABCs.

It was our objective to determine which patient level factors contribute to improvements in the ABCs at 12 months following a multi-faceted diabetes care intervention (MDCI) based on the Chronic Care Model (CCM) [9–11,13,14].

2. Methods

This report is based on a multi-level, non-blinded, cluster design, randomized controlled trial (RCT) that took place in an underserved suburb of Pittsburgh, Pennsylvania between 1999 and 2003. Detailed methods were previously described [15].

2.1. Study population

2.1.1. Providers

Twenty-four general, family, and internal medicine practices ($n = 42$ providers) were eligible for the study. Eleven practices were involved in a baseline chart audit, which served as the source of eligible subjects for the RCT and was used to determine generalizability of the RCT population. 762 patient charts met the diagnostic criteria for diabetes [15] and were audited. Following the audit, three practices were block randomized to receive the Chronic Care Model (CCM) intervention, three practices received provider education (PROV), and five practices received usual care (UC) (Fig. 1).

2.1.2. Patients

Recruitment of subjects began in September 2000. Of the 762 eligible subjects, 119 subjects, 30 from CCM, 38 from PROV, and

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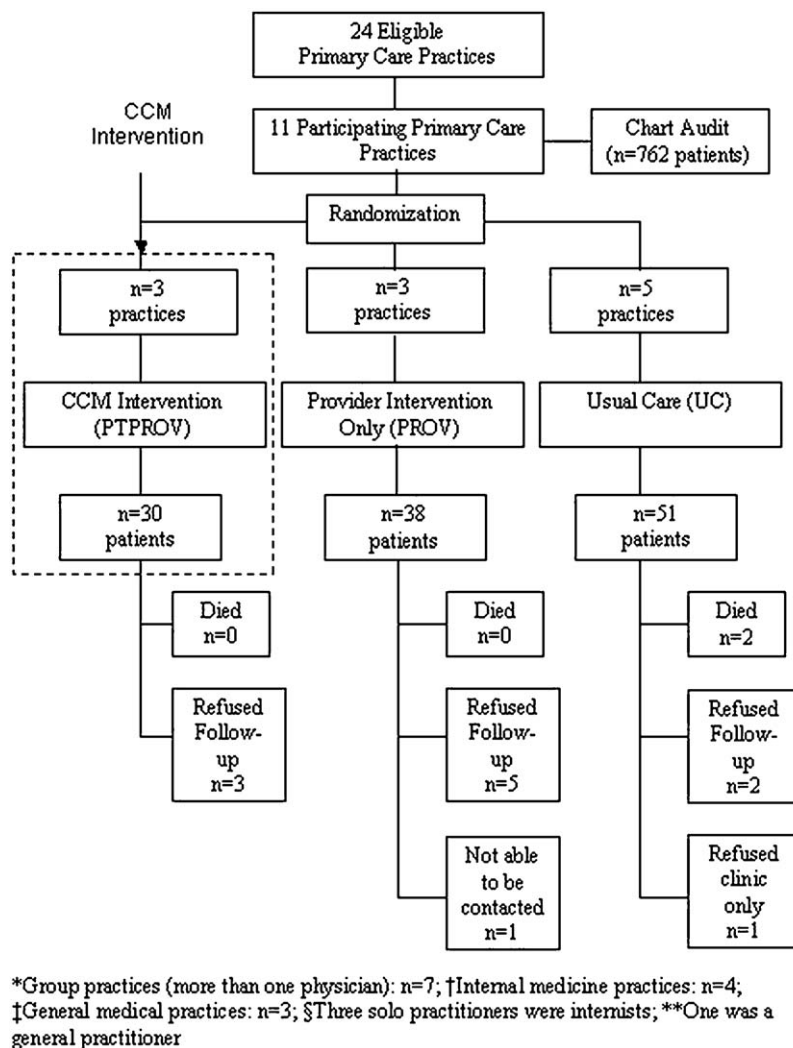


Fig. 1. Study design.

51 from UC, chose to participate. Recruitment ended in June 2002.

2.2. Interventions

2.2.1. Chronic Care Model (CCM) intervention

A full description of the CCM intervention is reported elsewhere [15]. Briefly, the intervention involved patient and provider education, and the provision of CCM elements in the community [10,11]. Provider-based education was offered at one problem-based learning (PBL) session. Providers were encouraged to redesign their process for routine diabetes visits using a certified diabetes educator (CDE) to provide DSME (diabetes self-management education) on provider specified “diabetes days,” and who was accessible for 6 months.

Patients receiving care from providers randomized to CCM were invited to six, weekly DSME sessions, which were facilitated by a CDE, followed by monthly support groups for 1 year. All sessions followed national diabetes standards [16] and were based on the empowerment approach to DSME [17].

2.2.2. Provider education intervention (PROV)

Providers attended one PBL session. Chart audit reports were given to all providers in CCM and PROV and reviewed by the CDE using academic detailing [18]. The CDE did not provide DSME in the PROV practices but was available for consultation during a 6-month period of the study.

2.2.3. Usual care (UC)

Providers were mailed their practice's chart audit report and decision support items.

2.3. Measures

Subjects had height, weight, and blood pressure (BP) measured according to standard protocol and had a non-fasting blood draw for lipids and A1c. Non-HDLc was calculated (total cholesterol – HDLc).

Subjects ($n = 119$) participated in a one-hour question and answer session with a CDE and completed a series of questionnaires [Modified Diabetes Care Profile [19], Diabetes Empowerment Scale (DES) [20], the Barriers to Diabetes Care Instrument (BDCI) [21], and the World Health Organization (Ten) Quality of Well-Being Index (WHO-10) [22]]. All measures were also administered 12 months after baseline to 107 subjects. Two subjects provided no clinical data, yielding a final population of 105 subjects for these analyses.

2.4. Statistical methods

Measures of central tendency were used for descriptive analyses. Forward linear regression was utilized to identify variables that contributed to the change observed in each outcome and the amount of model variability (adjusted R^2). Generalized

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