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Original Research

Influence of a Pay-for-Performance Program on Glycemic Control in Patients Living with Diabetes by Family Physicians in a Canadian Province

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ABSTRACT

Objectives: We evaluated the influence of the introduction of a pay-for-performance program implemented in 2010 for family physicians on the glycemic control of patients with diabetes.

Methods: Administrative data for all 583 eligible family physicians and 83,580 adult patients with diabetes in New Brunswick over 10 years were used. We compared the probability of receiving at least 2 tests for glycated hemoglobin (A1C) levels and achieving glycemic control before (2005–2009) and after (2010–2014) the implementation of the program and between patients divided based on whether a physician claimed the incentive or did not.

Results: Patients living with diabetes showed greater odds of receiving at least 2 A1C tests per year if the detection of their diabetes occurred after (vs. before) the implementation of the program (OR, 99% CI=1.23, 1.18 to 1.28), if a physician claimed the incentive (vs. not claiming it) for their care (1.92, 1.87 to 1.96) in the given year, and if they were followed by a physician who ever (vs. never) claimed the incentive (1.24, 1.15 to 1.34). In a cohort-based analysis, patients for whom an incentive was claimed (vs. not claimed) had greater odds of receiving at least 2 A1C tests per year before implementation of the incentive, and these odds increased by 56% (1.49 to 1.62) following its implementation. However, there was no difference in A1C values among the various comparison groups.

Conclusions: Introduction of the incentive was associated with greater odds of having a minimum of 2 A1C tests per year, which may suggest that it led physicians to provide better follow-up care for patients with diabetes. However, the incentive program has not been associated with differences in glycemic control.

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R É S U M É

Objectifs : Nous avons évalué l'influence de l'introduction d'un programme de rémunération implanté en 2010 pour les médecins de famille sur la régulation de la glycémie des patients diabétiques.

Méthodes : Nous avons utilisé les données administratives des 583 médecins de famille admissibles et de 83 580 patients diabétiques adultes du Nouveau-Brunswick sur une période de 10 ans. Nous avons comparé la probabilité de subir au moins 2 analyses pour mesurer les taux d'hémoglobine glycosylée (A1c) et d'arriver à maîtriser la glycémie avant (2005–2009) et après (2010–2014) l'implantation du programme et entre les patients répartis selon que le médecin demande ou non le remboursement des mesures incitatives.

Résultats : Les patients vivant avec le diabète démontraient de plus fortes probabilités de subir au moins 2 analyses d'A1c par année si la détection de leur diabète survenait après (vs avant) l'implantation du programme (RIA, 99 % IC=1,23, 1,18 à 1,28), si le médecin demandait le remboursement des mesures incitatives (vs ne le demandait pas) pour leurs soins (1,92, 1,87 à 1,96) au cours de l'année donnée, et s'ils étaient suivis par un médecin qui demandait déjà (vs jamais) le remboursement des mesures incitatives (1,24, 1,15 à 1,34). Dans

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une analyse de cohorte, les patients pour lesquels le remboursement des mesures incitatives était demandé (vs n'était pas demandé) avaient de plus fortes probabilités de subir au moins 2 analyses d'A1c par année avant la mise en place des mesures incitatives, et ces probabilités augmentaient de 56 % (1,49 à 1,62) à la suite de sa son implantation. Toutefois, il n'existait aucune différence dans les valeurs de l'A1c des divers groupes témoins. *Conclusions* : L'introduction des mesures incitatives était associée à de plus fortes probabilités de subir un minimum de 2 analyses d'A1c par année, ce qui peut suggérer qu'elle conduit les médecins à offrir de meilleurs soins de suivi aux patients diabétiques. Cependant, le programme de mesures incitatives n'a pas été associé à une meilleure régulation de la glycémie.

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Introduction

In 2014, diabetes expenditures amounted to 612 billion American dollars internationally (1). Given the high costs of diabetes and the expectation that its prevalence will increase (1), incentive programs designed for chronic disease management were established to entice physicians to follow guidelines for optimal management of the condition. Evaluations of the pay-for-performance program in the United Kingdom suggest that it is associated with a significant reduction in smoking (2), an increase in the likelihood that patients receive diabetes-related laboratory testing, including glycated hemoglobin (A1C) levels (3–5), and an increase in the likelihood that patients meet clinical guidelines for A1C levels (4,6–8). Other studies in Taiwan (9–11) and in the United States (12–15) also demonstrate that a pay-for-performance program increases the likelihood of patients' receiving diabetes-related laboratory testing (including A1C levels). However, other studies indicate that the same pay-for-performance program in the United Kingdom and a similar program in the United States are not related to improvements in glycemic control (13,14,16,17). These studies are limited by the use of a pre/post design, such that results potentially may be attributable to other factors.

To date, 1 longitudinal study compared patients followed under an incentive program to patients not followed by family physicians using the incentive (18), and 2 compared patients for whom physicians claimed an incentive to patients for whom no incentive was claimed (10,12). These studies found that the implementation of an incentive program is associated with reductions in rates of hospitalization and emergency admissions (10,12,18). Specifically, American patients under a low-cost health insurance plan for whom a physician claimed the pay-for-performance incentive for 3 consecutive years had a 25% lower rate of hospital admissions than patients not followed by physicians using the incentive program (12). In Italy, it was found that the more physicians supplemented their salaries through a pay-for-participation incentive, the fewer emergency admissions there were by their patients with type 2 diabetes (18). In Taiwan, a pay-for-performance incentive program specific to diabetes led to a reduction in hospitalizations and costs associated with all healthcare visits by US\$319 per patient who were followed over 4 consecutive years by a physician claiming the incentive (10). However, these 3 studies may suffer from a lack of generalizability because they almost exclusively included only a subsample of the population. More specifically, they studied patients from lower socioeconomic or minority backgrounds (12) or only patients with type 2 diabetes (10,18). Further, none of these studies assessed whether the practices of physicians claiming the incentive truly changed after implementation of the program. Results from 1 Canadian study suggest that although patients for whom physicians claimed the incentive were more likely than others to receive the recommended diabetes care, it was not the result of having implemented an incentive program because most of those patients were already receiving the recommended care before the incentive (19). Finally, no longitudinal study to date has documented the impact of the incentive program on glycemic control at a population level.

Since 2010, an incentive program targeting diabetes care has been available for family physicians in the province of New Brunswick, Canada (20). The objective of this study was to use longitudinal population-level data to determine whether the introduction of an incentive program in New Brunswick (population 751,171) related to changes in the quality of diabetes care provided by physicians in this province. Specifically, we aimed to: 1) compare the probability of having at least 2 laboratory tests for A1C levels ordered before and after implementing the incentive program for patients newly diagnosed with diabetes; 2) compare the A1C levels of patients newly diagnosed with diabetes during the same 2 periods; 3) compare the probability of having at least 2 A1C laboratory tests between patients for whom a physician claimed the incentive to patients those for whom no physician claimed the incentive; 4) compare the A1C levels of the same 2 groups of patients; 5) compare the probability of having at least 2 A1C laboratory tests between patients of physicians who claimed the incentive at least once and patients of physicians who never claimed the incentive; 6) compare the A1C levels of the same 2 groups of patients; 7) follow all patients diagnosed before implementation in time, compare the probability of having at least 2 A1C laboratory tests between those for whom an incentive was claimed and those for whom no incentive was claimed; and 8) follow all patients diagnosed before implementation and compare the A1C levels of the same 2 groups of patients.

Methods

We procured 5 administrative databases from the New Brunswick Department of Health. A diabetes registry database, which consists of all patients with diabetes in the province (identified as any patient with A1C levels $\geq 6.5\%$), was created by matching the Medicare patient list (which contains patient characteristics of all New Brunswick residents) with glycemic control data from the Laboratory Data Repository (which includes all A1C tests in the entire New Brunswick population from 2001 to 2014). Linking patients to their respective family physicians was made possible by data on medical actions and incentives for which a fee was claimed by healthcare providers (billing codes to Medicare). The Medicare Resident Registry and the Physician Profile database were used to extract information on characteristics of primary care providers and their practices. The data used for this study were completely anonymized, and the study was approved by the Institutional Review Board of the Centre hospitalier universitaire de l'Université de Sherbrooke in September 2015.

Diabetes incentive code

Through Medicare, the provincial health insurance plan, a new code was added to the list of New Brunswick Medical Society billing codes in 2010 to enable family physicians to claim CAN\$83.83 per year per patient living with diabetes and receiving all recommended diabetes management actions. These actions include a prescription for renal function and lipid profile testing annually, in addition to blood pressure and A1C testing twice per year. To be

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