



Original Research

Internal Medicine Resident Training and Provision of Diabetes Quality of Care Indicators

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ABSTRACT

Objective: Existing research is inconsistent on whether clinical experience is associated with improved management of type 2 diabetes mellitus. We sought to determine whether meeting diabetes quality indicators improves as general internal medicine physicians progress from first to last year of residency. **Methods:** We performed a chart abstraction of electronic health records data covering the period from September 2008 to August 2011. In all, 352 patient records were abstracted and linked to year of resident provider. Type 2 diabetes quality indicators included glycated hemoglobin (A1C), low-density lipoprotein, diastolic and systolic blood pressure control, obtaining urine microalbumin or prescription for angiotensin-converting enzyme inhibitor or angiotensin receptor blocker and documented foot and eye examinations. Chi-square tests and logistic regression analysis were used to determine whether year of residency was associated with quality of care indices before and after adjusting for patient age, gender, race, body mass index and cigarette smoking.

Results: Urine microalbumin was the most often met indicator (76.9%), and the least often met indicator was documented eye examination (37.4%). Results of adjusted analysis indicated that the odds of A1C, low-density lipoprotein control, obtaining urine microalbumin and documented eye and foot examinations were greater among patients of second- and third-year residents compared with those of first-year residents (odds ratios range, 1.26–5.12). Urine microalbumin was the indicator most often in optimal control and least often met indicators were eye and foot examinations.

Conclusions: We observed improvement in quality of diabetes care throughout residency. However, the low prevalence of several quality indicators indicates a need for additional training and quality improvement.

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R É S U M É

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Objectif : La recherche actuelle portant sur l'association de l'expérience clinique à l'amélioration de la prise en charge du diabète sucré de type 2 demeure contradictoire. Nous avons cherché à déterminer si les indicateurs de qualité relatifs à la prise en charge du diabète étaient mieux respectés à mesure que les résidents en médecine interne générale avançaient dans leurs années de résidence.

Méthodes : Nous avons effectué l'extraction des données électroniques des dossiers médicaux couvrant la période de septembre 2008 à août 2011. Dans l'ensemble, 352 dossiers de patients ont été analysés et reliés à l'année de résidence du prestataire. Les indicateurs de qualité relatifs à la prise en charge du diabète de type 2 comprenaient l'hémoglobine glyquée (A1c), les lipoprotéines de basse densité, la régulation de la pression artérielle systolique et diastolique, l'obtention de la microalbuminurie ou l'ordonnance d'inhibiteurs de l'enzyme de conversion de l'angiotensine ou des inhibiteurs des récepteurs de l'angiotensine, et les examens bien étayés des pieds et des yeux. Les tests du chi carré et les analyses de régression logistique ont été utilisés pour déterminer si l'année de résidence était associée aux indicateurs de la qualité des soins avant et après l'ajustement de l'âge, du sexe, de la race, de l'indice de masse corporelle et du tabagisme chez les patients.

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Résultats : La microalbuminurie était l'indicateur le plus fréquemment observé (76,9 %) et l'examen bien étayé des yeux était l'indicateur le moins souvent observé (37,4 %). Les résultats des analyses ajustées indiquaient que les cotes de l'A1c, de la régulation des lipoprotéines de basse densité, de l'obtention de la microalbuminurie et des examens bien étayés des yeux et des pieds ont été plus élevées chez les patients des résidents de deuxième et de troisième année comparativement aux patients des résidents de première année (intervalle des ratios d'incidence approché, 1,26–5,12). La microalbuminurie était l'indicateur le plus souvent observé dans la régulation optimale et les examens des yeux et des pieds étaient les indicateurs les moins observés.

Conclusions : Du début à la fin de la résidence, nous avons observé une amélioration de la qualité des soins offerts aux diabétiques. Cependant, la faible fréquence de plusieurs indicateurs de qualité montre le besoin de formation supplémentaire et d'amélioration de la qualité.

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Introduction

The Centres for Disease Control and Prevention (CDC) estimated that there are approximately 25.8 million people (8.3%) living with type 2 diabetes mellitus in the United States (1). Type 2 diabetes may lead to cardiovascular diseases (myocardial infarctions, peripheral arterial diseases and strokes), blindness and chronic kidney diseases. There is a significant decrease in these diseases by optimal management of type 2 diabetes and hypertension and hyperlipidemia, both of which may coexist with type 2 diabetes in many patients. Incentives for proper management of type 2 diabetes as per evidence-based guidelines are placed by various professional organizations and insurance companies. Different professional organizations, particularly the American Diabetic Association (ADA), have defined diabetes quality indicators as per best clinical practice standards (2–8).

Because the prevalence of type 2 diabetes is expected to nearly double between 2009 and 2034 in the United States (9), determining the ability of newly trained physicians to manage the disease informs public health resource allocation and points to which areas of management require the greatest improvement. Existing studies of resident physicians' ability to meet quality indicators have produced heterogeneous results. In an academic hospital setting, 71% of residents' patients had low-density lipoprotein (LDL) controlled (<100 mg/dL), 78% had documented annual eye examination and 31% had documented foot examination (10). Suwatté et al (11) reported that residents providing care at an urban public hospital outperformed faculty with 30% of patients with A1C less than 7%, 23% of residents' patients had LDL less than 100 mg/dL, 50% had annual eye examination and 55% had documented foot examination. Using a retrospective medical record review, Dushay et al (12) reported that medical residents achieve the same quality of type 2 diabetes care as faculty. In contrast, evaluation of 67 residency clinics compared with 703 practising physicians suggests residents underperformed on meeting eye and foot examination quality indicators and had lower percentage of patients with A1C less than 7%, but were similar in percentage of patients with blood pressure and LDL controlled.

One limitation of existing measures of resident performance has been evaluating 1 year of residency or collapsing across resident years. By determining whether resident care improves from the first to the third year provides a more accurate measure of expected provider ability at the completion of residency. Identifying evidence of improved performance across each year of residency may offer insight into the training experience associated with the year in which performance improves. In the present report, we sought to determine whether medical residents improve in their documentation of quality indicators and increase achievement of quality metrics as they progress from the first to the third year of residency in a large academic practice.

Methods

Residency training first through third year

Immediately after medical school, first-year residents have a very limited knowledge of the overall management of type 2 diabetes. Within 6 months to a year of residency, they have practical experience of managing type 2 diabetes with increasing responsibility under the supervision of a faculty member in the continuity care clinic, where they manage on average 3 to 4 patients per week. Because we have a large diabetic patient population, the residents will frequently encounter diabetes as a primary diagnosis or as a secondary comorbid condition during a visit for another disease. During their second or third year, they will have a 2-week-long ambulatory training block on endocrinology in which type 2 diabetes is the main focus, as it is the most prevalent disease in endocrine services. During the second and third years, they are also encouraged to do quality assessments of their peers. Additionally, because type 2 diabetes is such a common disease in the community, all residents (first year to third year) frequently encounter type 2 diabetes during their rotations, either in the ward or in the intensive care unit.

A retrospective chart review from electronic health records of diabetes patients who visited internal medicine residency clinics from September 2008 to August 2011 was performed by two of us (B.P.D. and M.A.). Documentation of type 2 diabetes quality of care indicators was abstracted from the review and included glycohemoglobin (A1C), systolic blood pressure, diastolic blood pressure, low-density lipoprotein (LDL) cholesterol, annual dilated eye examination, annual feet examination, urine microalbumin and prescription of angiotensin-converting enzymes inhibitors (ACEI) or angiotensin receptor blockers (ARB). Abstracted patient characteristics included age, gender, race, body mass index (BMI) and tobacco use. In all, 352 patient charts were abstracted. Charts were selected by resident provider year; thus, 100 charts were abstracted for first-year residents, 152 for second-year residents and 100 for third-year residents.

Type 2 diabetes quality

We created variables to determine whether care was provided for each quality of care indicator and whether optimal control metrics were met as per standards of care defined by the ADA (3–8). Optimal control of type 2 diabetes mellitus was determined by the ADA criteria of A1C below 7%, BP less than 130/80, LDL cholesterol less than 100, annual diabetes eye examination, feet examination, urine microalbumin or prescription of ACEI or ARB.

Analytic approach

Frequency distributions were used to summarize categorical data. Cross tabulations were computed with year of residency as

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